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Resilience in the Sahel-Enhanced (RISE) Program Impact Evaluation: **Report of Recurrent Monitoring Survey 2018-2019**

July 2020

ABOUT THE REAL AWARD

Resilience Evaluation, Analysis and Learning (REAL) is a consortium-led effort funded by the USAID Center for Resilience. It was established to respond to growing demand among USAID Missions, host governments, implementing organizations, and other key stakeholders for rigorous, yet practical, monitoring, evaluation, strategic analysis, and capacity building support. Led by Save the Children, REAL draws on the expertise of its partners: Food for the Hungry, Mercy Corps, and TANGO International.

RECOMMENDED CITATION

Smith, L., and Frankenberger, T. (2020). *Resilience in the Sahel-Enhanced (RISE) Program Impact Evaluation: Report of Recurrent Monitoring Survey*. Produced by TANGO International and Save the Children as part of the Resilience Evaluation, Analysis and Learning (REAL) Associate Award.

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COVER PHOTO

Eleven-year-old Zeinabou, left, pounding millet with her mother, Barira, on Wednesday, Dec. 7, 2016 at her home in the Maradi region of Niger. Photo credit: Victoria Zegler / Save the Children. 2016.

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ACKNOWLEDGEMENTS

TANGO would like to thank numerous individuals for the support they provided to the RISE Recurrent Monitoring Survey 2018-19. They include Greg Collins, Tiffany Griffin, Lynn Michalopoulos, Melissa Levenger, Sally Rey, and Andre Mershon (Bureau for Resilience and Food Security, USAID), as well as Patrick Smith and Bescaye Diop (USAID Senegal). In addition, we wish to acknowledge the staff of *Centre d' Expérimentations Economiques et Sociales pour l' Africque l' Ouest-Association Internationale* (CESAO) for their work in collecting the quantitative and qualitative data and supporting the logistics for this survey. We are grateful to Dramane Coulibaly the head of CESAO for his support. Doug Brown is acknowledged for his work on the data analysis, Tommaso Rosso for help with translating the qualitative data, and Carrie Presnall for formatting assistance. We also wish to thank Chris Bene for his work on the qualitative data collection. Lastly, we wish to thank all of the gracious people in the villages of the RISE program areas in Burkina Faso and Niger that took the time to be interviewed for this survey.

Tim Frankenberger

President

TANGO International

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ACRONYMS

AFDM	Africa Flood and Drought Monitor
ATR	Ability to recover
CESAO	*Centre d'Etudes Economiques et Sociales de l'Afrique de l'Ouest* or Center for Economic and Social Studies of West Africa
DID	Difference-in-difference
EDM	*Ecole de Maris* or Husbands' School
FAO	Food and Agriculture Organization of the United Nations
FASO	Families Achieving Sustainable Outcomes
FEWS NET	Famine Early Warning Systems Network
FFP	Office of Food for Peace
FGD	Focus group discussion
GIS	Geographical Information System
HFIAS	Household Food Insecurity Access Scale
IE	Impact evaluation
KII	Key informant interview
LAHIA	Livelihoods, Agriculture and Health Interventions in Africa
NDVI	Normalized Difference Vegetation Index
PASAM TAI	*Programme d'Appui à la Sécurité Alimentaire des Ménages-Tanadin Abincin Iyali* or Household Food Security Support Program-Tanadin Abincin Iyali
PRIME	Pastoralists' Areas Resilience Improvement through Market Expansion
REGIS-AG	Resilience and Economic Growth in the Sahel–Accelerated Growth
REGIS-ER	Resilience and Economic Growth in the Sahel–Enhanced Resilience
RISE	Resilience in the Sahel Enhanced
RR	Realized resilience
SAREL	Sahel Resilience Learning Project
SE	Shock exposure
SPI	Standardized Precipitation Index
TANGO	Technical Assistance to Non-Governmental Organizations, International
TMG	The Mitchell Group, Inc.
US	United States
USAID	United States Agency for International Development
WHO	World Health Organization

EXECUTIVE SUMMARY

This report documents the analysis of the Recurrent Monitoring Survey (RMS) 2018-19 data set collected as part of the impact evaluation of the Resilience in the Sahel Enhanced (RISE) initiative. The overarching goal of the RISE program is to increase the resilience to shocks of chronically vulnerable populations in agro-pastoral and marginal agriculture livelihood zones of the Sahel. The five-year program is being implemented in targeted zones of Burkina Faso and Niger in West Africa.

The purpose of an RMS is to collect real-time data during a period of shock in order to understand the nature and evolution of shocks, how they affected households' well-being, how households coped with them, and what helped them recover. RMS 2018-19 was launched in response to signs that shock exposure was escalating in the RISE program area in its fourth year of operation. Quantitative data were collected from a representative, panel sample of 828 households over five rounds two months apart starting in August 2018 and ending in April 2019, a nine-month period. Qualitative data were concurrently collected in each round employing focus group discussions and key informant interviews. RMS 2018-19 follows on baseline (April 2015) and midline (April 2017) surveys and proceeds an endline survey to be conducted in 2020.

The objectives of this report are to (1) understand the severity and evolution of the shocks households faced over the RMS period; (2) document the coping strategies they used to deal with them; (3) assess how resilient they were to the shocks; and (4) explore how households' resilience capacities and the RISE program to date have affected their resilience. While resilience itself is an ability to manage or recover from shocks, resilience capacities are a set of conditions, attributes, or skills that enable households to achieve resilience.

Shock Exposure

Shock exposure has progressively increased over the course of the RISE project and was especially high in the year prior to the start of RMS 2018-19. During the RMS period itself, the surveyed areas were afflicted by four kinds of "exogenous" shocks, that is, shocks over which households had no control: multiple climate shocks, army worm infestations, an influx of violent extremism, and food price increases. The climate shocks were drought, excessive rains leading in some cases to severe and widespread flooding, lack of rain at critical times in the agricultural cycle, and high winds that led to lodging of crops in the field. The qualitative data confirm that the RISE program area was exposed to multiple weather- induced shocks (drought, flooding, and erratic rainfall) and their downstream effects. Violent extremism spread into all three regions which the RISE program operates in Burkina Faso (Sahel, Centre-Nord and Est) and into Tillabery in Niger. This extremism disrupted households' livelihoods, disrupted markets, led to a large influx of displaced populations, and limited access of humanitarian actors to villages. It also caused a great deal of fear and disruption of daily household life.

Some downstream impacts of the above shocks were animal disease outbreaks and deaths, lack of food and water for livestock, lack of water for household consumption, and elevated levels of human illnesses, especially malaria and respiratory illnesses. Poor harvests meant that households ran out of home-produced food earlier than usual and were forced to rely on high-priced market purchases.

The quantitative data show that shock exposure was much higher in the Burkina Faso area than in the Niger area due to greater exposure to drought, poor rainfall timing, animal disease outbreaks, and food price increases.

Coping Strategies

Various strategies enabled households to cope with having to purchase high-priced food from the market earlier than usual because of production shortfalls. The sale of animals was one way to cope with these shortfalls, but drought conditions led to shortages in water and fodder for animals, making them weak and susceptible to various diseases. People tried to sell their animals before they died but, in aggregate, this led to poor terms of trade, making it difficult to obtain enough food in exchange for the animals. As a result, people were forced to turn to other strategies to obtain resources to buy food such as drawing down on savings, petty trade, sale of wood and straw, sale of wild foods, casual labor in others' fields, mortgaging land, borrowing from friends and relatives, or going into debt to merchants. They also cut down on food consumption. Many of the male household members migrated in search of work. This often left the women in charge of feeding the children and elderly on very meager resources while the men were away.

Some households were forced to turn to negative coping strategies such as selling productive assets, consuming seed stocks, sending children to work for money, borrowing money from money lenders, and taking children out of school.

Water and wood shortages only exacerbated the work burden on women, forcing them to spend long hours fetching these resources at the cost of other household tasks. In some cases, this led to domestic disputes and even violence.

Violent extremism disrupted public services, led to school closings, and curtailed security services, adding a new element of uncertainty into the affected regions of the RISE program area. Qualitative data showed that beyond protecting themselves by not venturing out, people felt helpless to cope with this extremism and were at a loss of what to do.

Although the RISE program did introduce a number of interventions that were viewed as helpful, many of the respondents said that they did not have the resources to implement many of the new agricultural practices they were introduced to. They were forced to work on other people's fields rather than apply the new practices to their own fields due to the need to get money to eat. Also, the program did not have a response to dealing with floods or violent extremism.

Food Security and Resilience

As confirmed by the baseline and midline surveys, food insecurity is very high in both the Burkina Faso and Niger program areas. It is highest in the Niger area, where the percent of households severely food insecure rose to as high as 72.4 percent during the first round of RMS 2018-19, when shock exposure was at its peak.

Food security has remained relatively stable since the baseline in the Burkina Faso area. However, in the Niger area it had fallen by 30 percent by the end of the RMS period and showed a highly fluctuating pattern.

Analysis of the RMS quantitative data shows that the shocks experienced by households over the RMS period had a decidedly negative effect on their food security in both program areas. The types of shocks that had negative effects were: drought, flooding, insect invasions (in the Niger area), conflict shocks, food price increases, illnesses of household members (in the Burkina Faso area), and sudden increases in household size. The latter is possibly associated with the welcoming of Internally Displaced Persons into host households.

With regard to resilience, 62 percent of households were able to recover from the shocks they faced over the RMS period, defined as maintaining or increasing their food security. Fifty-five percent maintained stability in their food security, another indicator of resilience. Burkina Faso households were better able to recover than Niger households, despite the fact that they experienced greater shock exposure. This finding may be due to Burkina Faso's higher resilience capacities, the stronger positive influence of resilience capacities on resilience in the area, and/or greater local government responsiveness to community needs. The program areas had roughly the same percentage of households who were able to maintain stability in their food security.

Has resilience increased since the baseline? Using an experiential indicator of households' ability to recover from shocks that is time-comparable across the baseline, midline and RMS (round 1) surveys, it was found that resilience has increased in the Burkina Faso area despite greatly increased shock exposure. By contrast, it has declined in the Niger area over this period of similarly rising shock exposure.

Humanitarian Assistance and Government Responsiveness

Few households received humanitarian assistance over the RMS period, about 15 percent in any two-month period. The most common forms of assistance were food aid, social protection, drinking water, and cash assistance. However, the percent of households reporting that they had taken a child to get help at a feeding center "because they did not have enough food to eat" was notably high throughout the RMS period in the Niger area, reaching 33 percent in RMS round 2. Quantitative data were also collected from households to assess local government responsiveness to community requests for services, infrastructure, and food assistance. Some of the most common requests were for schools, drinking water services, health facilities, roads and food assistance. Households in the Burkina Faso area made more requests of their local governments than did those in the Niger area, and government responsiveness was higher in the Burkina Faso area.

Shock Recovery: The Role of Households' Resilience Capacities

The quantitative data were used to examine the role of households' resilience capacities, as measured during the midline survey, in strengthening their resilience to the shocks they faced over the RMS period. The results indicate that households' initial resilience capacities before the onset of the shock period did indeed strengthen their resilience, boosting their ability to recover and to maintain stability of their food security in the face of the shocks. Evidence is provided that they reduced the negative impacts of the shocks they faced on their food security, a further indication that they strengthened their resilience.

Households' own initial resilience capacities played a stronger role in boosting resilience in the Burkina Faso area than the Niger area. All three dimensions of resilience capacity—absorptive, adaptive and transformative—boosted resilience in the Burkina Faso area. Only households' adaptive capacities may have done so in the Niger area.

The RMS 2018-19 data analysis indicates that a wide range of specific resilience capacities helped strengthen households' resilience to the shocks they faced over the RMS period, including:

- Social capital (Bonding, bridging and linking)
- Access to informal safety nets
- Holdings of savings
- Asset ownership
- Access to financial resources
- Human capital
- Exposure to information
- Access to markets
- Access to infrastructure
- Access to services.

The evidence is strongest for three of these ten capacities, which were identified as determinants of households' resilience in analysis of all three RISE IE surveys—the baseline, midline, and RMS 2018-19:

- Bonding social capital
- Bridging social capital
- Access to financial resources.

Others that showed up in at least two of the surveys are holdings of savings, asset ownership, linking social capital, human capital, and access to infrastructure. These and the others listed above are the actionable programming and policy levers that can potentially strengthen households' resilience in the future.

The Impact of RISE on Households' Ability to Recover

Appropriate data for a formal impact evaluation of the RISE program will be collected as part of the endline survey. Meanwhile, an exploratory analysis of the effect of the program to date on households' resilience to shocks was undertaken as part of this report. The analysis draws on the differences across groups of households residing in RISE low exposure villages (the "control group") and high exposure villages (the "treatment group"). The high-exposure villages are benefiting from resilience programming while low exposure villages are not.

The analysis provides suggestive evidence that the RISE program's interventions to date *have* had a positive impact on households' ability to recover from the shocks they faced over the RMS period. There is also some evidence indicating that the interventions helped Niger households maintain stability in their food security in the face of drought.

Other indications that the program helped to strengthen households' resilience is analysis signaling that it reduced the negative impact of drought on Niger-area households' ability to maintain their food security and reduced the negative impact of flooding on Burkina Faso-area households' food security. Overall, it appears that RISE interventions have had a stronger positive impact in the Niger program area than the Burkina Faso area.

It is important to keep in mind that the positive associations between RISE program interventions and the resilience outcomes seen here are likely due to the program's efforts to strengthen households' resilience capacities. It will be possible to pinpoint which resilience capacities have been strengthened when new data on the capacities are collected as part of the final impact evaluation.

Implications for Programming

The analysis carried out in this report has provided suggestive evidence that the RISE program interventions have had a positive impact on households' resilience to shocks. However, they indicate that some additional investments may be necessary to have a greater impact on food security and resilience.

The following are the recommendations for programming:

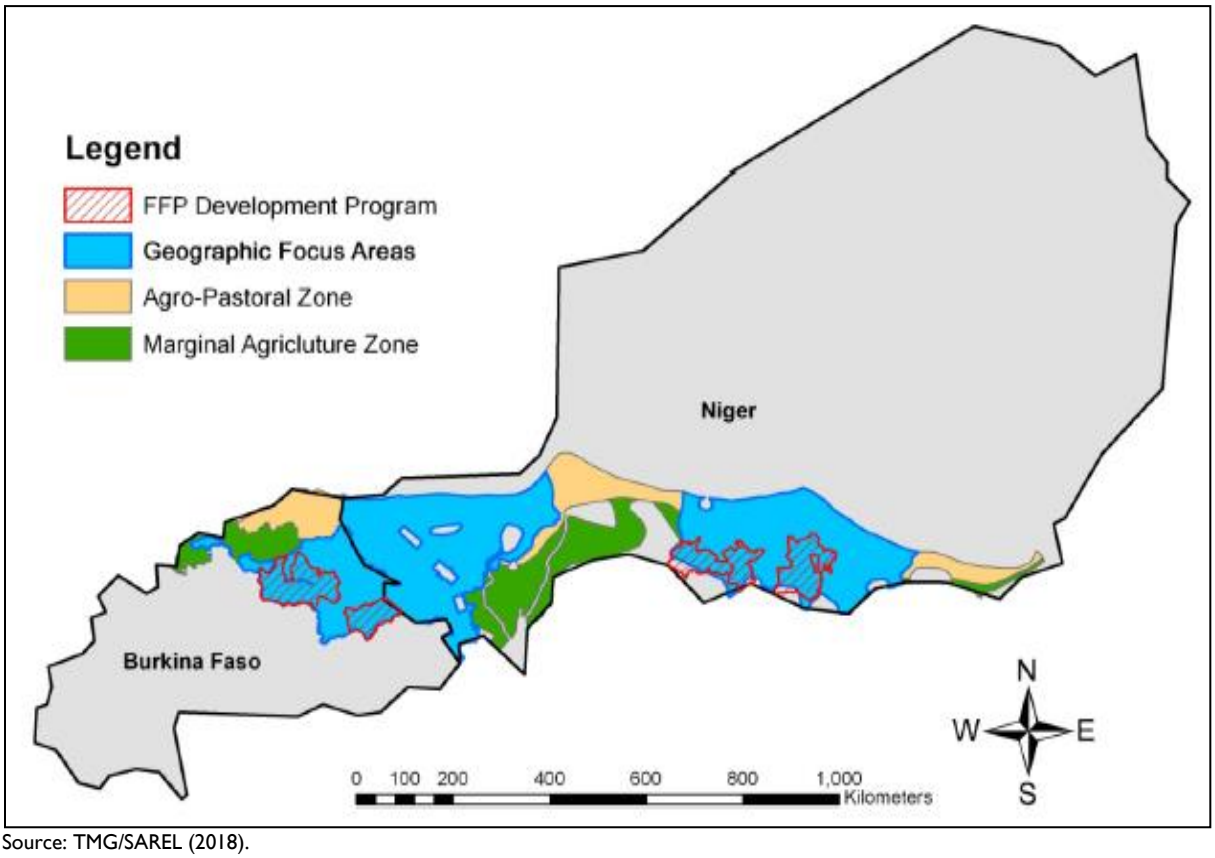
- Redesign and expand safety nets
- Expand the focus of Disaster Risk Reduction activities beyond droughts to include floods
- To address rising violent extremism, implement interventions that focus on conflict mitigation and provision of mental health and psychosocial support services
- Continue to invest in savings groups to strengthen social capital, especially in areas where social capital is beginning to erode
- Continue to strengthen households' adaptive capacity
- Continue to strengthen transformative capacity.

1. INTRODUCTION

This report documents the analysis of the Recurrent Monitoring Survey (RMS) 2018-19 data set collected as part of the impact evaluation of the *Resilience in the Sahel Enhanced* (RISE) initiative. The overarching goal of RISE is to increase the resilience to shocks of chronically vulnerable populations in agro-pastoral and marginal agriculture livelihood zones of the Sahel. The Sahel is the focus of RISE because of its mix of deeply-rooted chronic poverty, food insecurity, recurrent climate shocks, conflict, and violent extremism that drives vulnerable communities into recurrent crises. With regard to climate shocks, the region experienced three droughts over the course of a decade, in 2008, 2010, and 2012. Further, as seen in this report and the RISE program midline survey report (Smith et al. 2018), substantial rainfall deficits and surpluses can occur in localized areas even in the absence of a major covariate shock that draws international attention.

The five-year RISE program, which began in 2014 help, strategically layers, sequences and coordinates humanitarian and development efforts to end the Sahel's vicious cycle of crises and help vulnerable communities stay firmly on the path to development (USAID, 2015). An initiative of the United States Agency for International Development (USAID), it is being implemented in targeted zones of Burkina Faso and Niger (see Figure 1.1).

Figure 1.1 The RISE program area within Sahelian Burkina Faso and Niger



Source: TMG/SAREL (2018).

The overall objective of the RISE impact evaluation (IE), of which this report is a part, is to provide insight into how the package of RISE interventions impacts (1) households' resilience; (2) households' resilience capacities (factors that enhance resilience); and (3) household resilience outcomes such as food security. Resilience and resilience capacities are defined in Box 1.

Box 1: What are resilience and resilience capacities?

The RISE IE conceptualizes **resilience** according to the USAID definition, which states that resilience is "the ability of people, households, communities, countries, and systems to mitigate, adapt to, and recover from shocks and stresses in a manner that reduces chronic vulnerability and facilitates inclusive growth." According to this definition, household resilience is the ability of a household to mitigate, adapt to, and recover from shocks and stresses.

While resilience itself is an ability to manage or recover, **resilience *capacities*** are a set of conditions that are thought to enable households to achieve resilience in the face of shocks. Resilience capacities can be classified into three categories:

- ***Absorptive capacity*** is the ability to minimize exposure to shocks and stresses (*ex ante*) where possible and to recover quickly when exposed (*ex post*).
- ***Adaptive capacity*** involves making proactive and informed choices about alternative livelihood strategies based on changing conditions.
- ***Transformative capacity*** relates to governance mechanisms, policies/regulations, infrastructure, community networks, and formal safety nets that are part of the wider system in which households and communities are embedded. Transformative capacity refers to system-level changes that enable more lasting resilience.

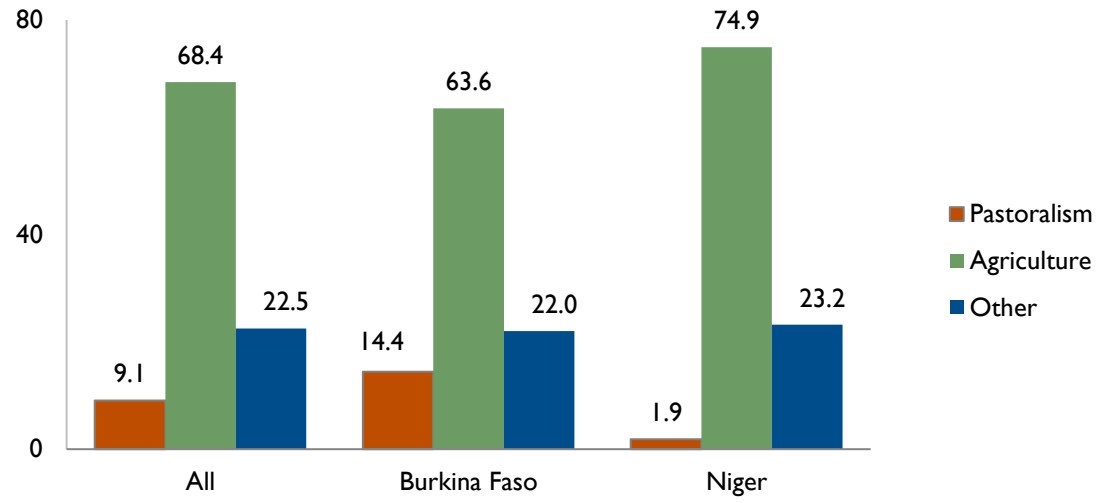
Recurrent Monitoring Surveys collect real-time data during the course of an actual shock on the nature of the shock, how households are coping, and the degree of their resilience to it (Scantlan and Sagara 2019). Using both quantitative and qualitative data, this RMS 2018-19 analysis focusses on a nine-month period of particularly high shock exposure towards the end of the RISE program, between August 2018 and April 2019. In addition to the general goals of an RMS—to understand the nature of the shocks households faced, how they coped, and their resilience—this RMS examines the role their resilience capacities played in their recovery. Further, in advance of the final impact evaluation, it expands on the midline data analysis to undertake exploratory investigation of the impact of the RISE program on households' resilience to the shocks. The analysis is based on data collected from a panel of 828 households from which data were also collected for the midline survey.

The Program Area: Sahelian Zones of Burkina Faso and Niger

The Sahel is an ecologically fragile transition zone of grasslands and shrubs between the Saharan Desert to the north and the savanna to the south that is highly susceptible to climate and economic shocks.[1] The dominant livelihood activities are farming and livestock rearing. Given the semi-arid climate, the most commonly-grown crops and staple foods are millet and sorghum.

Figure 1.2 gives the percent of households residing in the RISE p rogram area falling into three livelihood groups: predominantly pastoralism, predominantly agriculture, and "other".[2] The livelihoods of the latter group are dominated by retailing, remittances from migration, and artisanal mining. Agriculture dominates across the RISE area. Pastoralism as a main source of livelihood makes up a small, but significant proportion of households in the Burkina Faso area (14 percent). Roughly one-fifth of households in the RISE area rely predominantly on the non-climate dependent occupations for their livelihoods. While one livelihood source may predominate, most households derive at least some of their food and income from both agriculture and livestock rearing, lying somewhere along the agro-pastoralism spectrum.

Figure 1.2 Percent of households falling into livelihood groups, by program area



Source: RISE baseline data

The chronic vulnerability of households in the program area is marked by high levels of poverty—an estimated 61.8 percent of all people live on less than US$1.90 per day (SAREL 2018)—water scarcity, weak governance, and gender inequality. A complex set of drivers have

[1] The sources for this section are: FEWS NET (2010), USAID (2013), USAID/Senegal (2013), Refugees International (2013), Burkina Faso FEWS NET Food Security Outlook reports from April 2014-August 2015, and Niger FEWS NET Food Security Outlook reports from April 2014-July 2015 (2015).

[2] The classification of households into predominant livelihood groups is based on survey respondents' reports of the proportion of food/income derived from various types of livelihood activities. The pastoralism group contains households reporting that "Livestock production and sales" provides the greatest proportion of their food/income. The agriculture group contains households reporting that "Farming/crop production and sales" provides the greatest proportion of their food/income. The "other" group contains all other households. The livelihoods of these households are dominated by retailing, remittances from migration, and artisanal mining, occupations that tend to be less climate-dependent than those of the pastoralism and agriculture-predominant groups.

resulted in a large and growing resilience deficit such that households are increasingly unable to mitigate, adapt to, and recover from shocks and stresses in a manner that does not further exacerbate their vulnerability.

Three main drivers are at the root of the area's resilience deficit. The first is population growth, which exerts pressure on social and economic systems and strains already degraded natural resources, increasing conflicts over water, pasture rights, and agricultural land. Both Burkina Faso and Niger have among the world's highest population growth rates.

The second driver of the area's resilience deficit is climate change and variability. Climate change is already causing temperature and rainfall extremes that exceed historical patterns across the Sahel. Climate models predict increasing temperatures, more variable rainfall, and more frequent extreme events, such as droughts and floods, over the coming decades. Given that the large majority of households' livelihoods are dependent on rainfall, the result is more uncertain production levels, food price volatility, income variability, asset depletion, and increased indebtedness.

The third driver is a growing reliance on markets to meet households' food needs, leading to increased vulnerability to food price volatility. The area is structurally in food deficit, being increasingly dependent on the market for staple cereals from more productive regions to the south.

Together, these drivers underlie a trend towards populations in former pastoralist areas becoming increasingly involved in agriculture as well as wage labor and other cash income-generating activities such as petty commerce. Faced with repeated crises, more and more poor households are finding themselves with no other choice but to leave their villages in search of other forms of income. In Burkina Faso this "distress migration" is often to work in gold mines, while in Niger it is to seek employment in urban areas or even to beg.

Among the RISE program area's most vulnerable are its children under five. According to the midline data, the prevalence of chronic undernutrition (stunting) is 46.8 percent. That of acute undernutrition (wasting) is 15.9 percent (see SAREL 2018), far higher than the 10 percent deemed by the World Health Organization (WHO) to signify serious concern (WHO, 2000).[3] Such high malnutrition is caused by the area's excessive levels of food insecurity, as described in Chapter 4 of this report, poor child feeding practices, and unsanitary conditions.[4]

[3] In comparison, the stunting prevalence in Burkina Faso as a whole was 32.9 percent in 2012. That of Niger as a whole was 43.0 percent. The wasting prevalence of Burkina Faso was 10.9 percent and that of Niger was 18.7 percent (United Nations Children's Fund, WHO, & World Bank, 2015).

[4] According to the SAREL midline report (TMG/SAREL 2018), only 5.7 percent of children 6-23 months in the program area receive a minimum acceptable diet, and 39.8 percent of children 0-6 months are exclusively breastfed. With respect to sanitation, although 68.9 percent of households use an improved drinking water sources, only 19.4 percent have a sanitation system for human waste that is covered or otherwise intended to prevent contamination.

1.1 The RISE Program

To reach its overall goal of increased resilience, the RISE program has three specific objectives. They are:

1. **Increased and sustainable economic well-being through**
   - Diversified economic opportunities;
   - Intensified production and marketing;
   - Improved access to financial services; and
   - Increased access to market infrastructure.
2. **Strengthened institutions and governance through**
   - Improved natural resources management;
   - Disaster risk management;
   - Strengthened conflict management systems; and
   - Strengthened government and regional capacity and coordination.
3. **Improved health and nutritional status through**
   - Increased access to potable water;
   - Improved health and nutrition practices, particularly for mothers and children;
   - Improved family planning; and
   - Better sanitation practices.

In addition to longer-term development activities, when needed, USAID's Office of Food for Peace (FFP) and Office of U.S. Foreign Disaster Assistance (OFDA)[5] will target the most vulnerable with life-saving interventions. These include direct food provision through the World Food Programme as well as cash transfers, temporary employment, improved access to seeds, and training in more effective livestock and agricultural practices.

The RISE program includes three **sets of projects**:

1. Resilience and Economic Growth in the Sahel–Enhanced Resilience (REGIS-ER), a multi-sectoral resilience project launched in 2014;
2. Resilience and Economic Growth in the Sahel–Accelerated Growth (REGIS-AG), a focused value chain project launched in 2015; and
3. Ongoing FFP development projects underway since 2012.[6]

Regarding the resilience-focused projects, USAID (2019) states that "By building on and out from other programs in the Sahel, such as the FFP development programs in the RISE zone of intervention, these investments will give an estimated 1.9 million of the region's most vulnerable

[5] USAID's Office of Food for Peace (FFP) and Office of U.S. Foreign Disaster Assistance (OFDA) merged into the USAID Bureau for Humanitarian Assistance (BHA) in June 2020.
[6] In Burkina Faso the projects are: Families Achieving Sustainable Outcomes (FASO), Catholic Relief Services (CRS), and Victory Against Malnutrition Project (VIM) (Agricultural Cooperative Development International/Volunteers in Overseas Cooperative Assistance [ACDI/VOCA]). In Niger, they are Pasam-Tai (CRS), Sawki (Mercy Corps), and Livelihoods, Agriculture and Health Interventions in Africa (LAHIA, Save the Children).

a real chance to break the cycle of crisis and lessen the need for humanitarian assistance in the future" (p. 1).

The targeted zones of the RISE program include areas in the Sahel, Centre-Nord and Est provinces of Burkina Faso, which are highlighted in Figure 1.3, and the Tillabery, Maradi, and Zinder provinces in Niger, highlighted in Figure 1.4. The population of these combined areas is eleven million.

Figure 1.3 Map of Burkina Faso delineating the three provinces in which the RISE program operates

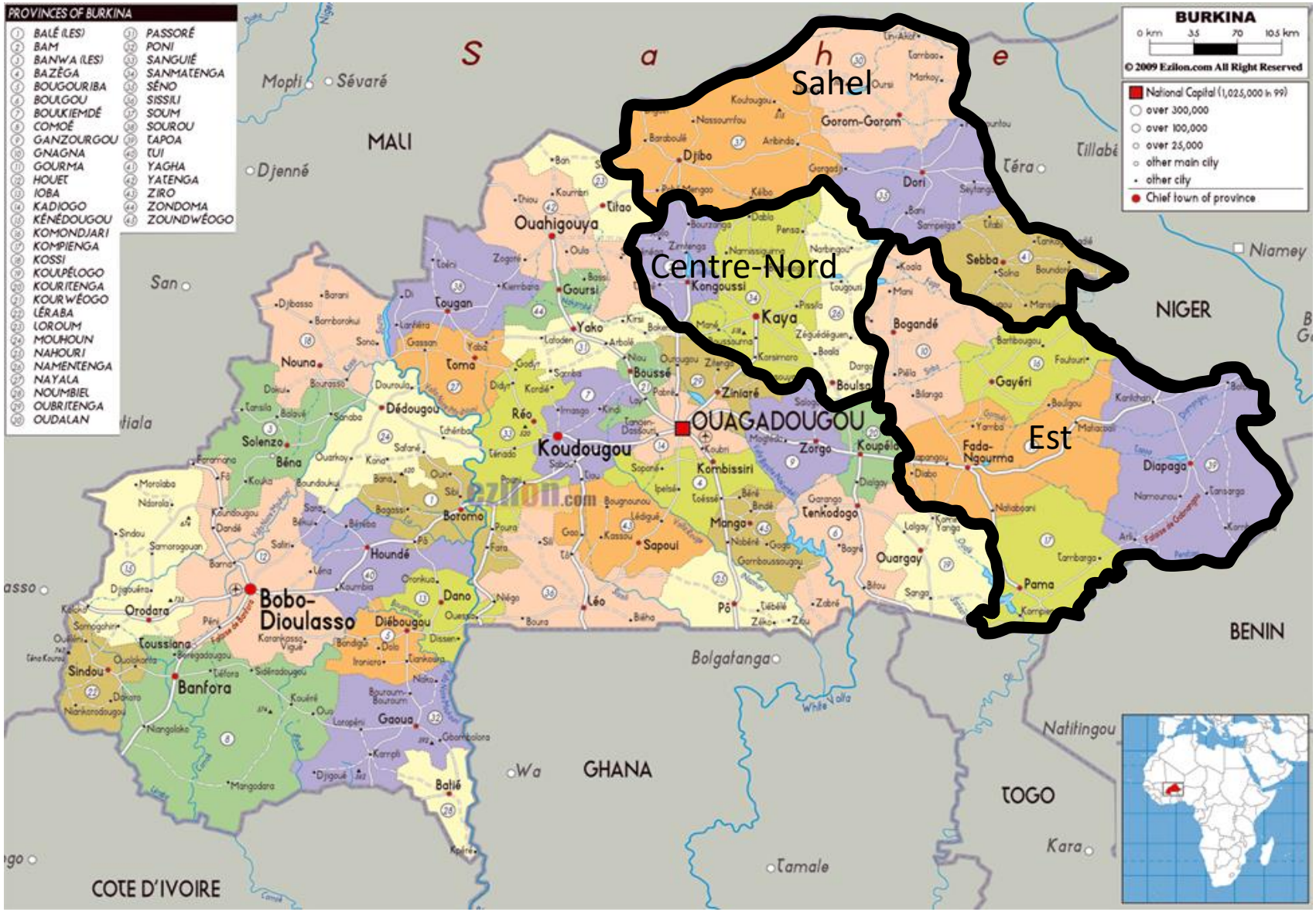
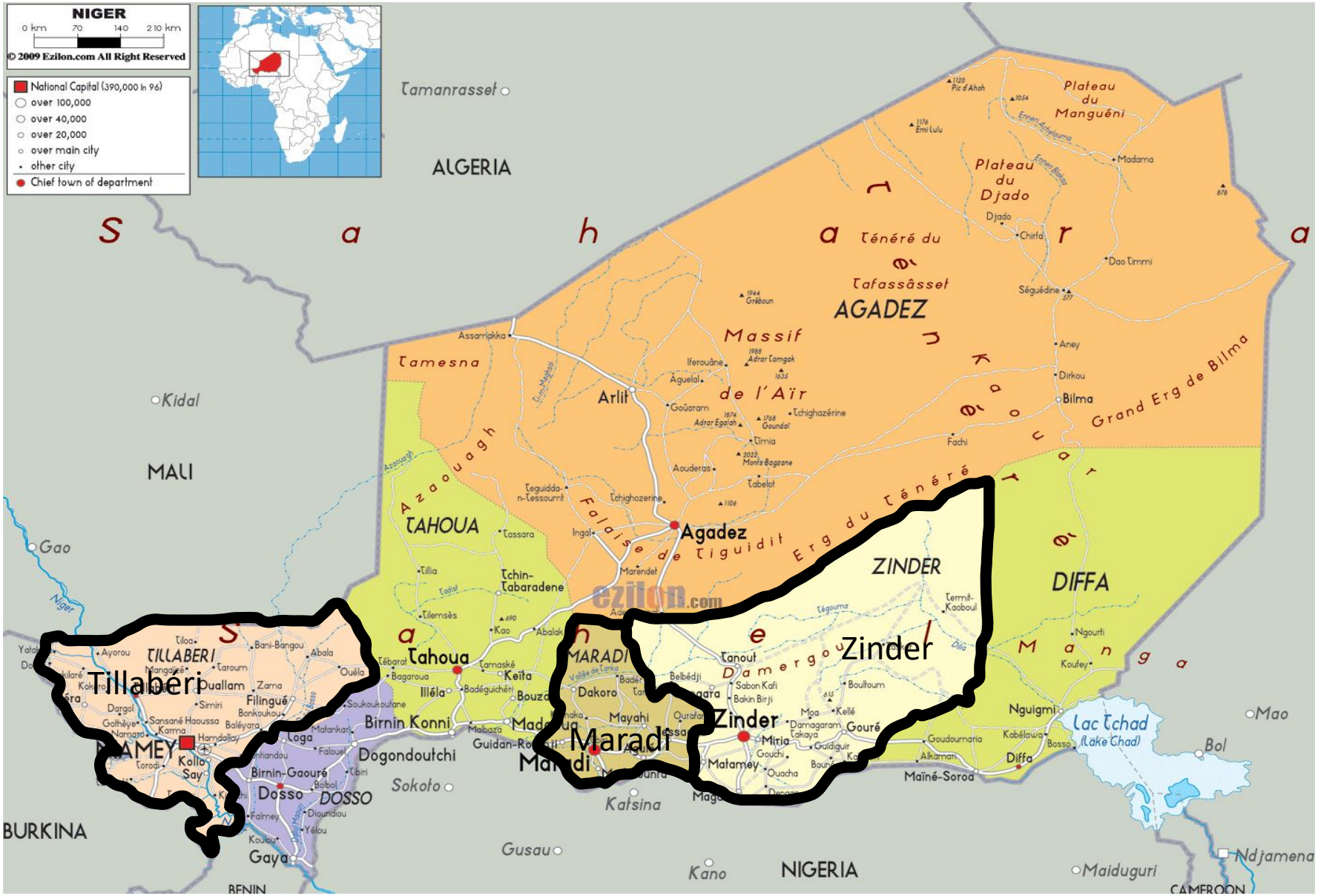


Figure 1.4 Map of Niger delineating the three provinces in which the RISE program operates



1.2 Objectives of this Report and Research Questions

The objectives of this report are to (1) understand the severity and evolution of the shocks households faced over the RMS period; (2) document the coping strategies they used to deal with them; (3) assess how resilient they were to the shocks; and (4) explore how households' resilience capacities and the RISE program to date have affected their resilience.

Research questions:

Shock Exposure and Coping Strategies

1. What types of shocks did households experience over the RMS period, including environmental, conflict and economic shocks? Does the type of shocks experienced differ by program area?
2. How has shock exposure evolved over the course of the RISE program?
3. Which coping strategies were used by households to deal with the shocks? How did they evolve over the RMS period, and how do they differ across the program areas?

Food Security and Resilience

4. How has food security changed since the baseline, and over the RMS period, for the program area as a whole, and the two program areas?
5. How did households' shock exposure affect their food security? Which types of shocks had a negative impact?
6. How resilient were households to the shocks they faced? Does this differ across the program areas?
7. Has resilience increased over the course of the RISE program?

Shock Recovery: The roles of households' resilience capacities and exposure to RISE interventions

8. Did households' resilience capacity help them recover from shocks? Which dimensions of resilience capacity: absorptive, adaptive and/or transformative capacity?
9. Which specific capacities (e.g., bonding social capital, access to financial resources) strengthened their resilience?
10. Did exposure to RISE interventions help households recover from the shocks they faced over the RMS period? Does the degree to which RISE did so differ across the program areas?

1.3 Organization of the Report

Chapter 2 lays out the data collection and analysis methodologies employed for RMS 2018-19. Chapters 3 and 4 then present the data on shock exposure and coping strategies, and food security and resilience to shocks, respectively. Chapter 5 presents data on humanitarian assistance and government responsiveness to community requests for services, infrastructure, and food assistance. Chapters 6 and 7 examine the effects of households' resilience capacities and RISE program interventions on their resilience to the shocks they faced over the RMS period. Finally, the concluding chapter gives a summary of the key findings and discusses implications for programming.

2. METHODOLOGY

This chapter lays out the methods used for collecting the RISE RMS 2018-19 data, both quantitative and qualitative, and for conducting the data analysis.

2.1 Quantitative Data Collection and Analysis

2.1.1 Data Collection

The RMS data were collected over a period of nine months, from August 3, 2018 to April 30, 2019, in five rounds two months apart. Table 2.1 gives the dates of data collection for each round. The data were collected by TANGO and the *Centre d'Etudes, D'Expérimentations Économiques et Sociales de l'Afrique de l'Ouest* (CESAO), an African international association based in Burkina Faso that also collaborated in the collection of the midline data. The survey is preceded by baseline (April/May 2015) and midline (April/May 2017) surveys, the latter from which the RMS sample of panel households was selected.

Table 2.1 RMS 2018-19 rounds: Dates of data collection

Survey round	Start date	End date
Round 1	August 3, 2018	August 31, 2018
Round 2	October 15, 2018	November 3, 2018
Round 3	December 8, 2018	December 30, 2018
Round 4	February 12, 2019	February 26, 2019
Round 5	April 14, 2019	April 30, 2019

The sampling designs for the three RISE surveys were planned with the need to collect data for two intervention groups—high exposure and low exposure—in order to evaluate the impact of RISE interventions. The high exposure group consists of households residing in villages slated to benefit from a set of ongoing FFP projects initiated prior to the start of RISE (see Chapter 1), from the Resilience and Economic Growth in the Sahel–Enhanced Resilience (REGIS-ER) project, or from the Resilience and Economic Growth in the Sahel–Accelerated Growth (REGIS-AG) project. The low exposure group, which will serve as the control group in the final impact evaluation, consists of households residing in villages not slated to receive support from these programs.

Data collection for the *baseline* survey followed a two-stage, stratified sampling design with the high- and low-exposure intervention groups serving as the strata. In the first stage, 37 villages were randomly selected within the high exposure group and 63 villages within the low exposure group using Probability Proportional to Size (PPS) sampling.[7] In the second stage, 25 households were randomly selected within each village to reach the desired sample size of

[7] The unbalanced allocation of villages across the high and low exposure groups will facilitate the impact evaluation to take place using the endline data, in particular the application of Propensity Score Matching.

2,500.[8] In the case of the *midline* survey, the same 100 villages selected for the baseline served as the first-stage sampling units, forming a village panel. A new set of 25 randomly-selected households was sampled using updated household listings. The baseline and midline surveys had a 99.7 percent response rate, yielding final analysis samples of exactly 2,492 households for both.

Sampling for RMS 2018-19 itself also took place following a two-stage, stratified design with the high- and low-exposure intervention groups serving as the strata. In this case, however, 18 villages were randomly selected from among the 37 high-exposure villages and 18 from among the 63 low-exposure villages. Thus, half of the 36 RMS 2018-19 sample villages are in the high-exposure group and half in the lower-exposure group. In the second stage of sampling, all households in each of the 36 RMS villages that were in the midline analysis were included in order to form the final household panel data set.

The final sample contains 828 households in 36 villages, 18 villages in the Burkina Faso program area and 18 in the Niger program area. In all, 92 percent of the midline households in the 36 villages also participated in the RMS survey. As can be seen in Table 2.2, which details the geographic distribution of the RMS sample, all three regions within each country that were included in the baseline and midline—Centre-Nord, Est and Sahel in Burkina Faso; Maradi, Tillabery and Zinder in Niger (see maps in Figures 1.3 and 1.4)—are represented in the RMS. Note that 67 percent of the sample households (555 out of 828) participated in all five rounds of the survey.[9]

Table 2.2 The RISE RMS 2018-19 sample

Program area	Region	Number of villages	Number of households
Burkina Faso	Centre-Nord	9	207
	Est	6	143
	Sahel	3	75
Niger	Maradi	5	116
	Tillabery	7	146
	Zinder	6	141
Total		36	828

Table 2.3 compares values of variables describing key characteristics of the RMS households (N=828) with values calculated using the full midline data set (N=2,493), including food security, resilience, shock exposure, resilience capacity and economic status. The only meaningful difference is that the RMS sample has a substantially lower cumulative vegetation deficit, perhaps because of accessibility issues. The variables reflecting households' well-being (food security), resilience, resilience capacities and economic status are all roughly the same across

[8] The actual number of households sampled was 28 in order to reach the target of 25 needed to achieve the desired sample size.
[9] Of the remaining households 183 participated in four rounds, 71 in three rounds, and 19 in two rounds.

the two surveys. Thus, while keeping in mind the somewhat lower climate shock exposure of the RMS sample, we proceed as if the RMS households represent a random sample of RISE program area households, and that sample statistics from the baseline, midline and RMS samples are comparable (when appropriate sampling weights are applied [see below]).

Table 2.3 Comparison of key characteristics of midline and RMS samples

Measure	Midline	RMS	Difference	
Food security				
Food security index	18.70	18.80	0.10	
Dietary diversity score	5.01	5.10	0.09	
Resilience				
Ability to recover index	1.81	1.86	0.05	
Shock exposure (year before midline)				
Perceptions-based shock exposure index	11.11	11.06	-0.05	***
Cumulative rainfall deficit	2.26	2.20	-0.06	***
Cumulative vegetation deficit	104.5	67.8	-36.70	***
Resilience capacity (Midline)				
Absorptive capacity	43.0	44.4	1.40	**
Adaptive capacity	48.4	50.2	1.80	***
Transformative capacity	47.3	47.5	0.20	
Overall resilience capacity	50.0	51.5	1.50	**
Economic status (Midline)				
Consumption assets (indexes)	8.2	8.2	0.00	
Productive assets	4.1	4.3	0.20	***
Animals (Tropical livestock units)	3.6	4.6	1.00	
Land owned (ha)	3.4	3.4	0.00	
Overall asset index	23.4	24.2	0.80	

Notes: Asterisks represent statistical significance of the difference at 10 (*), 5(**) and 1(***) percent levels.

The RMS 2018-19 quantitative survey questionnaires can be found in Appendix 1. As will be seen in the following chapters, RMS round 1 is somewhat different from subsequent rounds in that some variables were collected using 12-month recall as opposed to the 2-month recall used in the other rounds.

2.1.2 Data Analysis

The quantitative data analysis was conducted with the statistical software STATA using both descriptive and multivariate analysis techniques.

2.1.2.1 Descriptive Analysis

In this report, the baseline, midline, and RMS household survey data are used to conduct descriptive analysis of indicators describing levels and trends in households' shock exposure, coping strategies, food security, and resilience. Indicator values are reported by program area and, in Chapter 7, by RISE intervention group (high exposure or low exposure). Where tests

for statistically significant differences in the indicators across these groups and time periods are undertaken, they are considered so if significant at the five percent level.

The sample size for data collection was chosen such that the number of observations used in each calculation is in most cases sufficient for calculation of these statistics. Any cases where it is too small for reliable measurement (n<=30) are denoted in the tables, and variable values are not reported.

Survey sampling weights were calculated to take into account the differing probabilities of households/villages being included in the sample across the high- and low-exposure intervention groups. Representativeness of the RISE operational area is maintained by weighting all statistics using these sampling weights.

2.1.2.2 Multivariate Analysis of the Role of Households' Resilience Capacities

In Chapter 6, multivariate regression analysis is first used to investigate Research Questions (8) and (9) addressing whether households' resilience capacities helped them recover from shocks: Did households' resilience capacity help them recover? Which dimensions of resilience capacity: absorptive, adaptive and/or transformative capacity? Which specific individual capacities strengthened their resilience?

The empirical techniques for investigating these questions differ depending on the measure of resilience being employed. As laid out in detail in Chapter 4, this report's analysis is based on four measures of resilience:

- Long-term realized resilience: The total change in food security over the RMS period;
- Short-term realized resilience: The change in food security between RMS rounds (2-month periods);
- Food security stability: Whether a household was able to stay within one point of its round 1 food security (or above) throughout the RMS period; and
- An index of households' perceived ability to recover.

The associations between the realized resilience indicators and indicators of resilience capacity are examined using standard growth regression (e.g., Yamano et al. 2015; Hoddinott and Kinsey 2001). The dependent variable is the change in food security (with food security denoted Y_i), and households' initial food security is controlled for. Also included as independent variables are households' resilience capacity (RC_i), shock exposure (SE_i), socio-demographic characteristics (vector X_i), and whether the household resides in the Niger program area.

The empirical specifications for long-term and short-term resilience, respectively, are:

$$Y_{i,\mathrm{r5}} - Y_{i,\mathrm{r1}} = \alpha + \beta_1 RC_i + \beta_2 SE_i + \beta_3 Y_{i,\mathrm{r1}} + \beta_4 X_i + \beta_5 \mathrm{Niger} + \varepsilon_i, \quad (1)$$

$$Y_{i,\mathrm{t}} - Y_{i,\mathrm{t}-1} = \alpha + \beta_1 RC_i + \beta_2 SE_i + \beta_3 Y_{i,\mathrm{t}-1} + \beta_4 X_i + \beta_5 \mathrm{Niger} + \mathrm{t} + \varepsilon_i, \quad (2)$$

where the ε_i are error terms. Equation (1) is run including all sample households for which data are available in both RMS rounds 1 and 5, which is a subset of the full 828 households (N=619). Equation (2) is run using a "round-stacked" data set, where households are represented up to four times, and the starting round (denoted t) is controlled for.

Food security stability, denoted S_i, is measured using a dichotomous (0,1) variable. It is examined using probit regression controlling for all of the independent variables of Equation (1) above. Note that household's initial-period (round 1) food security is included in order to take into account the fact that households with lower starting food security are more likely to have stable food security in the face of a negative shock simply because they have less room to fall below that starting value. The empirical specification is:

$$prob(S_i) = \alpha + \beta_1 RC_i + \beta_2 SE_i + \beta_3 Y_{i,\mathrm{r1}} + \beta_4 X_i + \beta_5 \mathrm{Niger} + \varepsilon_i. \quad (3)$$

Only households with data for all five rounds are included in the stability analysis (N=555).

Finally, households' perceived ability to recover (ATR) is examined using Ordinary Least Squares (OLS) regression, as follows:

$$ATR_{i,t} = \alpha + \beta_1 RC_i + \beta_2 SE_i + \beta_3 X_i + \beta_4 \mathrm{Niger} + \mathrm{t} + \varepsilon_i. \quad (4)$$

As for short-term realized resilience, equation (4) is run using a "round-stacked" data set where households are represented up to four times, and round (t) is controlled for.[10]

The household characteristics, X_i, included as independent variables in all regressions are:

- Number of household adult equivalents (and its square);
- Percentage of members in six age-sex groups (female 0-16, female 16-30, female 30+, male 0-16, male 16-30 and male 30+);
- Education of adult household members, measured as dummy variables for no education, achievement of a primary education by at least one member, and achievement of a secondary education by at least one member;
- Whether the household is a female-adult-only household;
- Predominant livelihood group (dummy variables for agriculture, pastoralist, and "other"); and
- An asset index based on ownership of four categories of assets: consumer durables, agricultural productive assets, livestock, and land.

Resilience marks the ability of households to withstand and recover from, specifically, shocks. Another way to look at whether households' resilience capacities boosted their resilience over the RMS period is to determine whether those capacities reduced the negative impact of

[10] The analysis is conducted only using the data from rounds 2 through 5 because the recall period for data collection of round 1 is 12 months rather than the 2 months used for subsequent rounds.

shocks they faced. Mathematically, this translates into testing whether an interaction term between resilience capacity and shock exposure is positive and statistically significant in a regression equation where food security is the dependent variable. The specification used for doing so is:

$$Y_{i,t} = \alpha + \beta_1 RC_i + \beta_2 SE_i + \beta_3 RC_i * SE_i + \beta_4 X_i + \beta_5 \text{Niger} + \text{t} + \varepsilon_i. \quad (5)$$

A coefficient on the interaction term, here β_3, that is statistically significant and positive indicates that the protective effect of resilience capacity is in action. Note that while simply running a regression with food security as the dependent variable without the interaction term gives us some information about the relationship between resilience capacity and food security, it does not tell us about households' ability to manage and recover from shocks, that is, their resilience.

2.1.2.3 Multivariate Analysis of the Role of RISE Interventions

In Chapter 7, multivariate regression and difference-in-difference analysis are used to investigate Research Question (10): Did exposure to RISE interventions help households recover from the shocks they faced over the RMS period? Does the degree to which RISE did so differ across the program areas?

These questions are first explored using multivariate regression analysis with empirical specifications similar to those used to address research questions (8) and (9), as follows:

Realized resilience

$$Y_{i,\text{r5}} - Y_{i,\text{r1}} = \alpha + \beta_1 T_i + \beta_2 SE_i + \beta_3 Y_{i,\text{r1}} + \beta_4 X_i + \beta_5 \text{Niger} + \varepsilon_i \quad (6)$$

$$Y_{i,\text{t}} - Y_{i,\text{t}-1} = \alpha + \beta_1 T_i + \beta_2 SE_i + \beta_3 Y_{i,\text{t}-1} + \beta_4 X_i + \beta_5 \text{Niger} + \text{t} + \varepsilon_i, \quad (7)$$

where T is the treatment variable equal to "1" if the household resides in a high-exposure village and "0" otherwise.

Food security stability

$$prob(S_i) = \alpha + \beta_1 T_i + \beta_2 SE_i + \beta_3 Y_{i,\text{r1}} + \beta_4 X_i + \beta_5 \text{Niger} + \varepsilon_i. \quad (8)$$

Perceived ability to recover

$$ATR_{i,t} = \alpha + \beta_1 T_i + \beta_2 SE_i + \beta_3 X_i + \beta_4 \text{Niger} + \text{t} + \varepsilon_i. \quad (9)$$

The specification for the interaction analysis examining whether high exposure to RISE interventions reduced the negative impact of shock exposure on food security is:

$$Y_{i,t} = \alpha + \beta_1 T_i + \beta_2 SE_i + \beta_3 T_i * SE_i + \beta_4 X_i + \beta_5 \text{Niger} + \text{t} + \varepsilon_i. \quad (10)$$

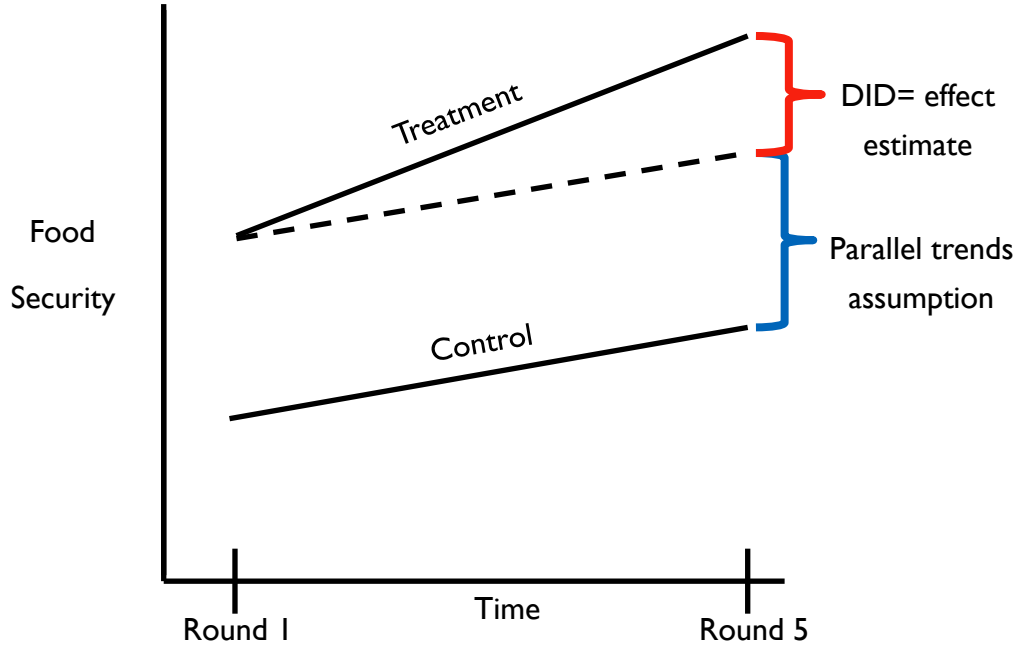
2.1.2.4 Difference-in-Difference Analysis of the Role of RISE Interventions

Next, research question (10) is explored using difference-in-difference (DID) analysis, whereby the change from RMS round 1 to round 5 in two key indicators of interest—food security and perceived ability to recover—for the treatment group is compared to that change for the

control group. This comparison removes any differences between the groups that was present at round 1 (and, therefore, obviously not a result of the program's interventions implemented during the RMS period).

Figure 2.1 illustrates difference-in-difference estimation for the example of food security. The effect estimate is given by the difference in the round 5 food security for the treatment group and that which is assumed would have occurred for the control group if it started at the same point as the treatment group.

Figure 2.1 Difference-in-Difference Estimation: Illustration for Food Security



An important assumption on which DID rests is the "parallel trends assumption": that the *trend* in a variable is the same for the treatment and control groups. This assumption will be further explored in Chapter 7.

2.1.2.5 A Note on Causality

Given the nature of the data collected, the techniques presented above used to analyze the data do not allow analysis of causal impacts of households' resilience capacity and the RISE program on the outcomes of interest. Specifically for the case of RISE interventions, standard growth regression, probit regression, OLS regression, and DID analysis in the forms employed do not account for the possibility of selection bias due to targeting and to household self-selection, and are thus not rigorous project impact evaluation techniques.[11] We take care to understand the direction of any such bias by comparing the initial food security, shock exposure, economic status, resilience capacities, and demographic characteristics of households across intervention groups before proceeding with the analyses.

[11] Inferring causality more directly would involve the use of different techniques (for example, experimental or instrumental variables methods) and/or a careful triangulation of multiple sources of quasi-experimental and non-experimental data (Smith et al., 2013).

Given the above, the results presented in this report should be considered exploratory and "suggestive." The focus is on determining whether the relationships between the dependent and independent variables are in the expected, hypothesized directions and deemed to be statistically significant, while controlling for other factors known to influence the dependent variables. We cannot claim to provide accurate estimates of the magnitude of effect of the hypothesized factors. However, the data do allow us to reasonably identify whether or not they play a role.

2.2 Qualitative Data Collection and Analysis

2.2.1 Qualitative Data Collection

Qualitative information is essential for situational awareness of the drivers of resilience and for providing a deeper understanding of the processes and interrelationships relevant to household and community resilience. It is used in this report to contextualize indicators employed in this study, provide an understanding of local concepts and definitions of resilience, and enable a better understanding of the significant changes that are measured quantitatively as perceived by households.

Qualitative data were collected in villages to determine how communities were coping with shocks, how social capital functioned in the face of shocks, and how community structures held up under shocks. Interviews also explored the relationships between community responses and household responses in order to compare collective and individual responses. Another objective was to determine gender-differentiated impacts of shocks. The fact that interviews were conducted over time provided a picture of the worsening conditions that communities faced through time and how they tried to cope with them.

Qualitative interviewers traveled with the quantitative teams and conducted focus group discussions (FGDs) or key informant interviews (KIIs) in selected sample villages (see Topical Outline in Appendix 2). Separate FGDs were held with men and women, and attendance ranged from five to six people. FGDs and KIIs were conducted every round. For Niger there were 15 male focus groups (118 participants) and 15 female FGDs (77 participants) over the 5 rounds. In terms of key informants, there were 13 male and 9 female informants. As for Burkina Faso, FGDs were conducted with 10 male FGDs (59 participants) and 10 female FGDs (56 participants). Many more KIIs were carried out in Burkina Faso which included 21 male KIIs and 17 female KIIs. The members of these focus groups include people from different age ranges as well to see if there are differences in the strategies employed by different age groups.

The types of key informants interviewed included the presidents and vice presidents of village development committees, presidents of women's groups, farmers (both male and female and young and old), housewives, livestock herders, members of village development committees, women's health representatives, member of savings groups (Tontine), the president of a Soudure bank, storekeeper, and a livestock market manager.

2.2.2 Qualitative Data Analysis

The qualitative information from the FGDs and KIIs were transferred into topically-structured matrices. This information was then analyzed to identify patterns in responses and contextual information to help explain the quantitative findings. Responses from participants were triangulated across the data sources to cross-check the reliability of information and to identify differences in perceptions between groups based on gender, age, and social and economic status.

Specific research questions that guided the qualitative analysis are:

1. What kind of shocks and stresses is the community experiencing/ How are the shocks and stresses affecting the community and household livelihoods?
2. Who in the community is most affected by the shocks and stresses (e.g., women, children, elderly) How?
3. What actions are households taking to respond to the shocks? What is the community doing to respond to the shocks?
4. How are the shocks affecting relations in the community? Has this changed over time?
5. How have the shocks affected relationships with other communities?
6. Are community leaders effective in organizing support for the members of the community?
7. What collective action is the community taking to protect or maintain resources mportant to the whole community?
8. What RISE interventions are being implemented in your community? How effective are they in helping people deal with shocks?

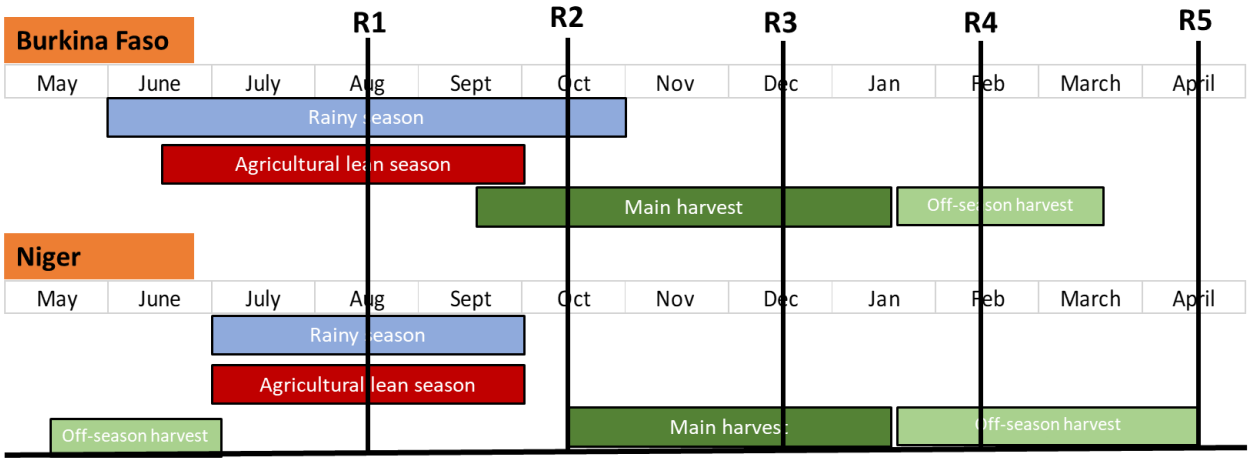
3. HOUSEHOLD SHOCK EXPOSURE AND COPING STRATEGIES

A full understanding of the extent of households' shock exposure, including the types of shocks they faced and how severe they were, is essential background for the resilience analysis of the rest of this report. Starting with the quantitative data, this chapter describes the changes in shock exposure that have occurred across the RISE baseline, midline, and RMS round 1 surveys. It then details the evolution of shock exposure across the five RMS rounds, including environmental shocks, conflict shocks, and economic shocks. The chapter also introduces the key shock exposure measures that will be employed in the empirical analyses of Chapters 6 and 7. Next the coping strategies households employed to deal with the shocks they faced are examined. These analyses rely on three sources of information: (1) quantitative data collected from households to date as part of the RISE Impact Evaluation; (2) satellite-derived data from the Africa Flood and Drought Monitor (AFDM); and (3) a review of Famine Early Warning Systems Network (FEWSNET) publications.[12]

The chapter ends with round-by-round analysis of the qualitative data on shock exposure and coping strategies collected during focus group discussions and key informant interviews.

For context, Figure 3.1 gives the seasonal calendar for the RISE program areas in relation to the five RMS rounds. Burkina Faso's rainy season runs from June through October. Niger's shorter rainy season runs from July through September. Both countries' lean seasons coincide with their rainy seasons.

Figure 3.1 Seasonal calendar for Burkina Faso and Niger in relation to the RMS 2018-19 survey rounds



Source: http://fews.net/west-africa/niger; http://fews.net/west-africa/burkina-faso

[12] For Burkina Faso the publications are Key Message Updates from 3/22/18 through 7/26/19 and Remote Monitoring Reports from 4/29/18 through 12/19/18. For Niger they are Key Message Updates from 7/18/18 through 5/19, Food Security Outlooks from 6/18 through 12/19, and the Food Security Outlook Update of 9/18.

3.1 Shock Exposure: Perspectives from the RISE Quantitative Household Surveys

3.1.1 Changes in Shock Exposure since the Baseline

Table 3.1 reports the percent of households in the RISE program area that reported experiencing 26 different shocks in the 12 months prior to the baseline (April/May 2015), midline (April/May 2017), and RMS round 1 (August 2018) surveys. Also given is the mean of an overall shock exposure index that takes into account the total number of shocks households experienced as well as their perceived severity. Perceived severity is measured using answers to the question "How severe was the impact on your income and food consumption?" The five possible responses range from "None" to "Worst ever happened." The index is calculated as a weighted average of the incidence of each shock and its perceived severity as measured on the five-point scale. That is, the incidence of each shock (0 or 1) is multiplied by its perceived severity (1, 2, 3, 4 or 5), and the resulting values are summed up across the 26 shocks. The possible index values range from 0 to 130, and the actual range is 4 to 68.

As can be seen from the values of the shock exposure index (illustrated in Figure 3.2), shock exposure has progressively increased over the course of the RISE project. It was especially high in the year prior to the start of RMS 2018-19 in both the Burkina Faso and Niger program areas.

Similar to the pre-baseline and pre-midline periods, some of the most common shocks in the year prior to the RMS were drought, insect invasions, animal disease outbreaks, food price inflation, and illness and related expenses. Additional shocks that became relatively more common in the year prior to RMS round 1—adding to the increased overall shock exposure—were excessive rains and increases in the prices of productive inputs. There were also significant increases in the incidence of conflict shocks (especially conflicts between farmers and herders and in thefts), several other economic shocks (drops in demand for products being sold by households, drops in the prices of such products, and debt repayment), deaths of household members (experienced by a full 20 percent of households in the year prior to RMS round 1), emigration of household members, and sudden increases in household size. The latter may be related to the increasing numbers of Internally Displaced Persons (IDPs) associated with rising civil insecurity (see below).

There were some notable differences in the types of shocks that registered increases between the Burkina Faso and Niger program areas. The percentage of households experiencing excessive rains rose by a full 68 percentage points (from 6.0 to 74 percent) in Niger, but only 24 percentage points in Burkina Faso. By contrast, drought rose more precipitously for Burkina Faso households, from roughly half of households at baseline to nearly 100 percent in the year prior to RMS round 1. Two other shocks rose more precipitously in Niger than in Burkina Faso: thefts and sudden increases in household size.

The overall finding from this trends analysis is that shock exposure, as reported by households themselves, was quite high in the year prior to the start of RMS 2018-19 compared to earlier on in

the RISE program's implementation period. This prior shock exposure was likely still affecting households throughout the survey period.

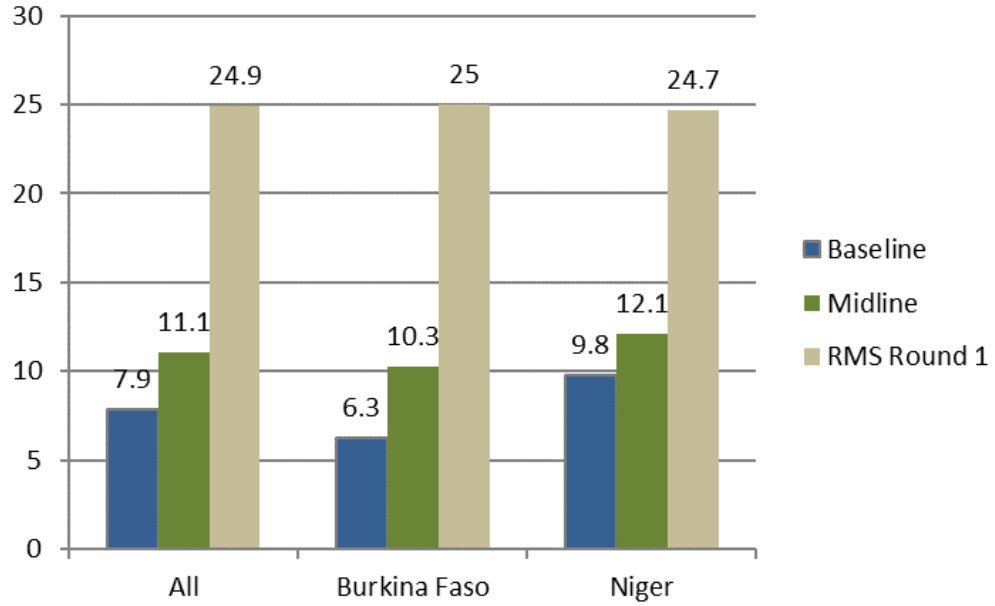
Table 3.1 Baseline-midline-RMS round 1 comparison of household shock exposure (self reported), by program area

Indicator	All			Program area					
				Burkina Faso			Niger		
	Baseline	Midline	RMS Round 1	Baseline	Midline	RMS Round 1	Baseline	Midline	RMS Round 1
Shock exposure index	7.9	11.1	24.9	6.3	10.3	25.0	9.8	12.1	24.7
Environmental shocks (% of households)									
Excessive rains	4.2	14.4	49.3	2.7	15.1	27.1	6.0	13.5	73.9
Too little rain/drought	53.7	67.5	75.5	55.7	73.2	94.7	51.3	60.4	54.2
Massive insect invasion	20.1	25.6	61.0	4.2	9.7	56.5	39.8	45.2	66.1
Animal disease outbreak a/	25.6	30.0	73.3	25.4	39.0	74.3	25.8	18.9	72.2
Bush fires	0.6	0.4	3.8	0.6	0.5	4.5	0.5	0.3	3.0
Conflict shocks (%)									
Land conflicts	2.1	1.2	5.5	0.9	1.6	3.2	3.5	0.6	8.0
Conflict between farmers & herders	2.7	1.1	10.0	2.9	1.7	11.3	2.3	0.2	8.5
Conflict between entire villages	0.0	0.2	2.4	0.0	0.3	0.6	0.0	0.1	4.3
Theft of assets/holdups	7.8	5.6	15.7	7.8	4.9	3.9	7.8	6.4	28.8
Economic shocks (%)									
Sharp food price increases	32.6	69.4	91.9	24.1	53.3	93.4	43.1	89.4	90.2
Unavailability of inputs	11.3	12.3	12.2	2.4	9.6	13.2	22.2	15.6	11.1
Drop in demand for products	1.9	2.4	13.8	1.1	2.4	21.2	2.9	2.4	5.6
Increase in price of inputs	8.1	10.9	39.9	5.1	11.7	44.8	11.7	9.9	34.6
Drop in price of products	3.5	3.5	23.1	3.0	5.7	23.1	4.0	0.7	23.0
Debt repayment	6.6	9.5	32.6	4.1	3.7	28.1	9.8	16.8	37.7
Job loss by household member	0.5	0.5	2.7	0.3	0.6	2.9	0.8	0.4	2.5
Long-term unemployment	1.2	1.2	3.3	0.7	1.7	4.4	1.8	0.6	2.2
Abrupt end of assistance/regular support from outside the household	0.9	1.0	7.3	0.9	0.7	11.1	1.0	1.5	3.2
Disease/exceptional health expense	20.2	29.8	59.1	17.5	34.7	55.1	23.5	23.8	63.5
Other shocks (%)									
Death of household member	6.4	6.7	19.9	7.8	7.0	17.8	4.6	6.4	22.2
Serious illness of member	10.6	12.4	44.5	10.7	16.3	46.5	10.4	7.6	42.4
Emigration of household member	3.8	3.9	29.7	0.7	1.6	28.3	7.6	6.7	31.2
Fire (house…)	1.4	0.9	3.7	0.7	0.9	2.4	2.4	1.0	5.3
Forced repatriation	0.2	0.3	2.1	0.1	0.0	0.6	0.3	0.7	3.8
Household dislocation	0.6	0.5	6.8	0.3	0.4	5.3	0.9	0.7	8.4
Sudden increase in household size	0.6	3.4	26.1	0.4	3.9	14.5	0.8	2.8	38.9

a For the baseline and midline one question is asked for all animals. For RMS Round 1 respondents are asked separately for three types of animals: bovines, sheep/goats, and poultry.

Note: The number of observations for RMS Round 1 is 707 (Burkina Faso: 328; Niger: 379).

Figure 3.2 Baseline-midline-RMS round 1 comparison of overall household shock exposure (self-reported), by program area



Note: Values reported are the shock exposure index

3.1.2 Evolution of Shock Exposure over the RMS Period

For the purposes of shock monitoring over the RMS period, data were collected for an expanded set of shocks—42 in all—for two-month recall periods (the time between each round). This expanded set is more representative of the actual range of shocks households in the program areas were experiencing at the start of the RMS, as observed during pre-testing of the survey questionnaires. The percentages of households reporting each in round 2 through round 5, along with the index of overall shock exposure, are reported in Table 3.2.

The most prominent shocks were:

- Excessive rains
- Too little rain/drought
- Lack of rain at a critical time
- Massive insect/bird invasion
- Animal disease outbreaks
- Lack of food and water for livestock
- Sharp food price increases
- Lack of water for household consumption
- Illness of household members.

Table 3.2 Comparison of household shock exposure (self-reported) across the RMS rounds, by program area

Indicator	All				Burkina Faso				Niger			
	Round 2	Round 3	Round 4	Round 5	Round 2	Round 3	Round 4	Round 5	Round 2	Round 3	Round 4	Round 5
Shock exposure index	22.4	13.1	11.3	14.6	26.2	16	13.5	15.6	18	9.9	8.9	13.7
Environmental shocks (% of households)												
Excessive rains	51.2	1.6	0.0	0.0	45.5	3.1	0.0	0.0	58.0	0.0	0.0	0.0
Rain at inappropriate time	24.5	3.5	0.0	2.8	23.8	6.7	0.0	5.7	25.3	0.0	0.0	0.0
Flood/flash flood	17.1	1.4	0.1	0.0	22.2	2.1	0.0	0.0	11.1	0.5	0.1	0.0
Too little rain/Drought	43.6	18.1	0.0	0.2	64.0	34.4	0.0	0.4	19.7	0.1	0.0	0.0
Lack of rain at critical time	50.3	14.1	0.0	0.0	72.9	26.8	0.0	0.0	23.8	0.0	0.0	0.0
Massive insect/bird invastion	56.4	4.2	0.4	0.0	36.8	7.6	0.0	0.0	79.3	0.3	0.9	0.0
Polluted water due to mining activity	0.5	0.0	0.4	0.1	0.2	0.0	0.0	0.3	0.9	0.0	0.8	0.0
Lack of water for household consumption	35.5	33.7	37.6	48.8	40.2	47.3	59.0	72.2	30.1	18.6	14.9	25.6
Animal disease outbreak:												
Bovines	24.1	17.7	15.4	9.8	31.5	22.3	17.6	13.9	15.3	12.6	12.9	5.7
Sheep/goats	44.7	29.7	21.7	19.0	49.7	44.9	33.1	23.9	39.0	12.9	9.7	14.0
Poultry	36.1	26.1	26.7	32.8	32.2	24.8	24.3	31.7	40.6	27.5	29.2	34.0
Bush fires/blaze	0.4	0.2	0.3	0.6	0.2	0.2	0.0	0.7	0.7	0.2	0.7	0.5
Conflict shocks (%)												
Land conflicts	2.0	0.4	0.4	0.7	2.5	0.0	0.0	0.0	1.3	0.9	0.9	1.4
Violent extremism	0.6	0.7	0.6	3.4	1.1	1.3	1.2	6.7	0.0	0.0	0.0	0.0
Conflicts between farmers & herders	5.5	0.7	0.0	0.0	6.1	0.7	0.0	0.0	4.8	0.8	0.0	0.0
Conflicts over potable water	3.4	0.7	0.2	1.2	4.4	0.4	0.2	1.7	2.2	1.0	0.2	0.7
Conflict over access to fodder for livestock	1.2	0.3	0.0	0.2	0.4	0.0	0.0	0.0	2.1	0.5	0.0	0.4
Conflict over access to water for livestock	0.9	0.1	0.2	0.3	1.1	0.0	0.2	0.6	0.6	0.2	0.3	0.0
Conflict/violence involving entire communities/villages	0.3	0.0	0.0	0.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.6
Theft of assets/holdups/burglary (animals, crops, etc)	11.1	4.5	4.3	2.4	2.1	2.0	2.0	0.6	21.7	7.2	6.8	4.1

Cont.

Table 3.2 Continued.

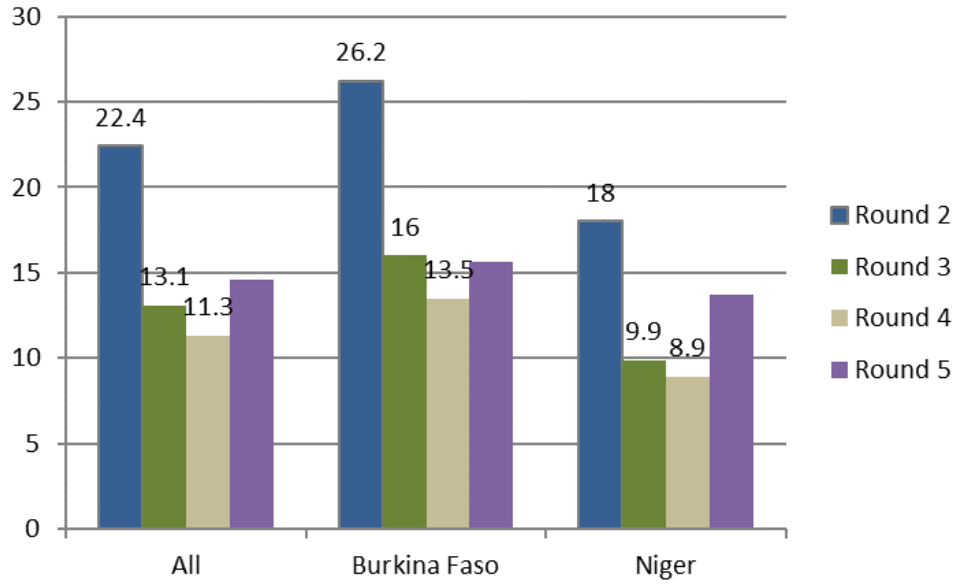
Indicator	All				Burkina Faso				Niger			
	Round 2	Round 3	Round 4	Round 5	Round 2	Round 3	Round 4	Round 5	Round 2	Round 3	Round 4	Round 5
Economic shocks (%)												
Sharp food price increase	41.4	18.8	48.2	49.3	65.1	24.0	57.3	45.4	13.5	13.0	38.5	53.2
Increase in prices of inputs a/	15.3	3.2	2.0	2.1	25.8	2.4	1.8	3.8	3.1	4.0	2.1	0.4
Drop in price of products a	15.9	12.0	1.2	3.0	13.6	11.2	0.0	0.7	18.6	12.9	2.4	5.4
Drop in demand for products a/	2.8	6.7	0.7	1.1	2.9	11.2	0.2	0.3	2.6	1.6	1.3	1.9
Unavailability of inputs a/	2.4	1.1	1.2	1.1	4.3	0.7	0.2	0.8	0.1	1.5	2.1	1.4
Lack of fodder for livestock	22.0	12.8	26.7	48.3	32.6	22.6	43.8	59.1	9.6	1.9	8.5	37.6
Lack of water for livestock	12.6	16.2	24.4	31.9	17.0	22.7	39.9	49.7	7.5	9.0	7.9	14.1
Loss of production means (land, tools, plow machine)	1.8	1.0	0.7	1.5	0.7	0.2	0.0	0.0	3.1	1.9	1.5	3.1
Debt repayment	22.3	23.4	18.8	17.5	24.2	24.2	23.8	24.3	20.2	22.5	13.4	10.6
Job loss by household memer	1.1	0.3	0.1	0.3	1.0	0.2	0.0	0.3	1.2	0.4	0.3	0.3
Long-term umemployment (non-agricultural)	2.1	1.0	0.5	1.9	1.5	0.7	0.5	2.4	2.8	1.4	0.6	1.4
Abrupt end of assistance/regular support from outside the household	4.0	3.0	1.8	1.8	5.7	5.4	3.1	2.1	2.0	0.3	0.4	1.5
Collapse of economic activity	12.6	8.0	6.5	4.3	16.2	9.8	7.0	3.8	8.3	6.0	5.9	4.8
Disease/exceptional health-related expense	51.9	38.7	33.1	35.0	48.3	40.7	34.1	37.2	56.2	36.4	31.9	32.7
Other shocks (%)												
Death of household member	7.6	4.7	4.0	3.6	8.0	6.2	4.7	1.9	7.3	3.0	3.2	5.3
Serious illness of household member	30.2	22.7	18.0	14.2	35.8	28.9	27.3	21.1	23.7	15.9	8.1	7.4
Emigration of household member	11.8	11.9	6.3	7.4	11.2	12.2	5.6	7.3	12.5	11.6	7.0	7.5
Fire (house, etc..)	0.9	1.1	0.7	1.1	0.5	1.7	0.3	0.9	1.4	0.5	1.0	1.4
Forced repatriation	0.1	0.3	0.4	0.3	0.3	0.0	0.4	0.7	0.0	0.6	0.5	0.0
Household dislocation	0.6	0.0	0.4	0.6	0.5	0.0	0.2	0.3	0.6	0.0	0.6	0.9
Sudden increase in household size	18.0	18.5	22.5	17.3	11.0	10.7	13.9	10.5	26.3	27.1	31.5	24.0
Number of households	763	792	758	735	398	414	387	365	365	378	371	370

a Inputs and products refer to agricultural or livestock inputs/products

Note: The recall period is 2 months. The round 1 data are not comparable to those of later rounds because they are for a 12-month recall period.

As illustrated in Figure 3.3, overall shock exposure was considerably higher in the two months prior to round 2, which coincided with the second half of the rainy season, than the other rounds. This is particularly so for Burkina Faso, for whom the overall index was around 60 percent greater than in the other rounds.

Figure 3.3 Comparison of shock exposure (self-reported) across the RMS rounds, by program area



Note: Values reported are the shock exposure index.

Shock exposure was much higher over the RMS period in Burkina Faso than in Niger: the shock index value averaged across the rounds is 2.5 times higher in Burkina Faso (10.6 versus 4.3), with most of this difference due to the greater shock exposure between round 1 and round 2. The shocks that were considerably higher (between rounds 1 and 2) for the Burkina Faso area were drought, lack of rain at a critical time, animal disease outbreaks (for bovines and sheep/goats), and sharp food price increases.

Some shocks remained widespread throughout the RISE program area over the entire RMS period, including lack of water for household consumption, animal disease outbreaks, food price increases, lack of fodder and water for livestock, debt repayment, illnesses of household members, and sudden increases in household size.

Climate Shock: Drought and Flooding

FEWSNET reports confirm that the Est province of Burkina Faso (see map, Figure 1.3), in which about one-third of Burkina Faso sample households reside, experienced an abnormal temporal distribution of rainfall in the beginning of the rainy season (just prior to RMS round 1), and that the rainfall totals for the first half of the season were generally lower over most of the country. Downstream impacts of these shocks can be seen in elevated percentages of households reporting lack of fodder for livestock and serious illnesses of household members.

By contrast, excessive rains appear to have been more of an issue in the increased round 2 shock exposure for the Niger area. Fifty-eight percent of households reported being exposed to excessive rains in round 2. FEWSNET publications confirm that heavy rainfall in Maradi and Zinder (see map, Figure 1.4) at that time causing flooding damage that destroyed an estimated 8,271 hectares of crops. Nationally, 2018 rainy season flooding caused significant damage to crop production, including market gardens and livestock rearing, in addition to people's homes and water infrastructure. By September (between rounds 1 and 2), the number of people affected by the flooding was estimated at 208,416.

Conflict Shock: Escalating Civil Insecurity

Violence related to long-standing inter-communal tensions in neighboring Mali escalated starting in early 2018 and spread into northern Burkina Faso, providing a path for an upsurge of terrorist threats and attacks from Islamic extremist groups (GIEWS 2019, Wagner and Cafiero 2019; FEWSNET 2018, 2019). The escalating violence led to a great deal of displacement throughout the northern and eastern areas of Burkina Faso, including the Sahel, Est and Centre-Nord provinces in which RISE program villages are located. As of January 2019, between RMS rounds 3 and 4, the entire Sahel and Est provinces were placed under a state of emergency by the government.

The downstream impacts of this conflict shock were numerous. Lack of buyers in livestock markets led to lower-than-usual prices for small ruminants. An atypical increase in livestock feed prices further negatively affected households' purchasing power. The insecurity also disrupted households' livelihoods by limiting their ability to plant crops, restricting their access to pasture and water points for their animals, disrupting their ability to earn income from the sale of small ruminants, gold panning, and petty trade. It also hampered their ability to receive assistance from humanitarian actors. The presence of a large number of Internally Displaced Persons (IDPs) (an estimated 220,000 in Northern Burkina Faso by June 2019) put pressure on host households' resources, including access to scarce water resources.

By round 5 signs of the ways the increase in civil unrest was affecting households began to appear, including large increases in the lack of water for household consumption and of fodder and water for livestock, and continued elevated levels of "sudden increase in household size", presumably due to survey households serving as hosts for IDPs. Nearly seven percent of Burkina Faso household included in the RMS survey reported exposure to "violent extremism" in round 5.

Within the Niger program area, the security situation was reportedly deteriorating in only one of the three regions represented in RMS 2018-19, Tillabery (especially in northern areas of the region where some of the RISE program villages are located). FEWSNET publications report violent attacks by militant groups in this area that—similar to the experience of Burkina Faso area—disrupted markets, livelihoods and cereal flows, led to displacement, and limited access of humanitarian actors to host communities.

3.2 Climate Shock Exposure Data from the African Flood and Drought Monitor

The Africa Flood and Drought Monitor (AFDM) is a real-time, satellite-based, drought monitoring and seasonal forecast system for sub-Saharan Africa. Current conditions are compared to an historical, multi-decadal reconstruction of the terrestrial water cycle using data from 1950-2008. The AFDM allows Geographical Information System (GIS) coordinates to be employed to download data from the Internet for localized geographical areas with 0.25° spatial resolution (Sheffield et al., 2014).

For the analysis of this report, month-by-month AFDM data on measures of rainfall, streamflow, and vegetation coverage deviations from the norm are employed, accessed using GIS coordinates for each of the 36 sample villages. The specific measures used are:

1. One-month Standardized Precipitation Index (SPI), which is the number of standard deviations that observed 1-month cumulative precipitation deviates from the climatological average;
2. Streamflow percentile of the norm (the 50th percentile represents the norm);
3. Normalized Difference Vegetation Index (NDVI) percentile, which measures the percentile of the norm of current vegetation coverage (the 50th percentile represents the norm).

The SPI is used to detect meteorological (rainfall -induced) drought and flooding. The streamflow percentile is used to detect surface water flow anomalies, which can be linked to local rainfall levels or, alternatively, to rainfall levels or water flows in other areas that affect surface water levels in the localized area of interest. NDVI percentiles are used to detect agricultural drought, which is characterized by soil water deficiency and subsequent plant water stress and reduced crop and/or fodder production (UN-SPIDER, 2017).

Figures 3.4-3.7 track the average 1-month SPI, streamflow percentile, and vegetation percentiles, respectively, from the baseline through the RMS period for the villages in the Burkina Faso and Niger areas. Table 3.3 specifies the cut-offs used for detecting drought and flooding conditions.

Figure 3.4 Rainfall deviation from the norm in RISE program areas, March 2015 to April 2019

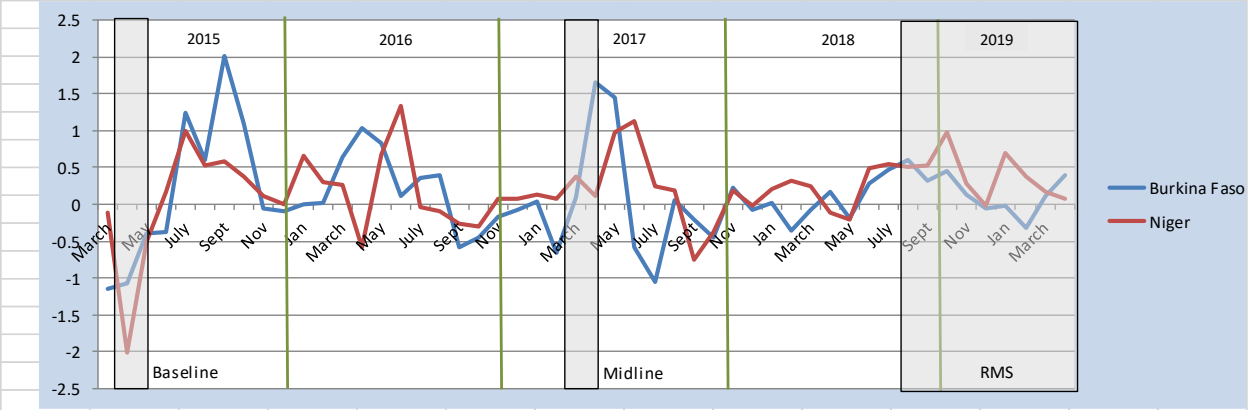
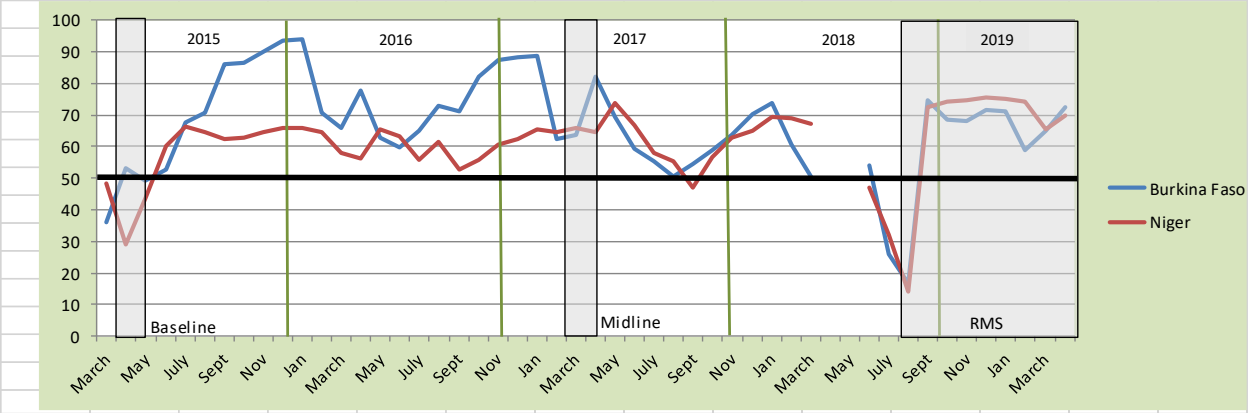
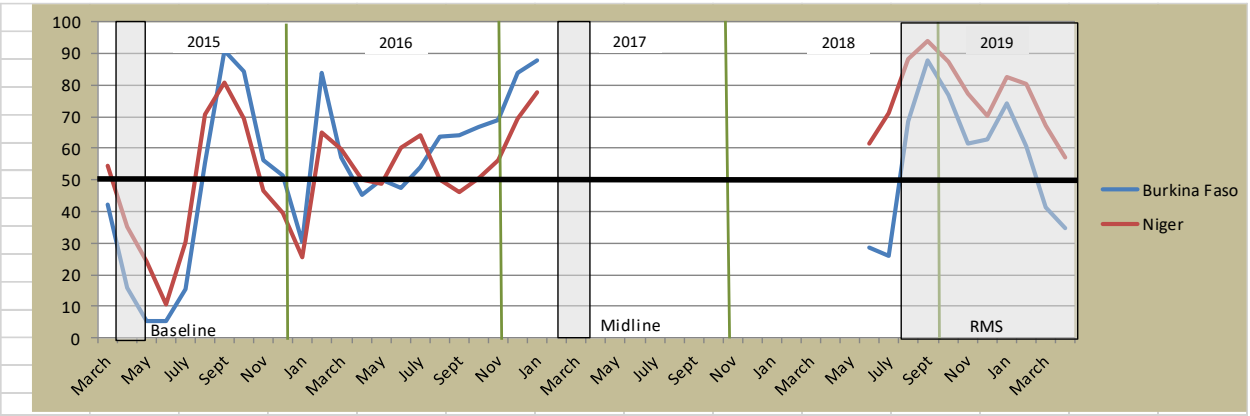


Figure 3.5 Streamflow deviation from the norm in RISE program areas, March 2015 to April 2019



Note: The 2018 break in the graph lines are due to gaps in the AFDM streamflow data series.

Figure 3.6 Vegetation deviation from the norm in RISE program areas, March 2015 to April 2019



Note: The 2017/18 break in the graph lines are due to gaps in the AFDM NDVI data series.

Table 3.3 Cut-offs on AFDM measures used for identification of drought and flooding conditions

AFDM measure	Rainfall				Streamflow				Vegetation
	Meteor-ological drought	Severe drought	Flooding	Severe flooding	Stream-flow drought	Severe drought	Flooding	Severe flooding	Agricult-ural drought
Standard precipation index	<= -0.8	<= -1.3	>= 1	>= 1.5					
Streamflow percentile					<= 24	<= 10	>= 76	>= 90	
Vegetation coverage percentile									< 40
Sources: National Drought Mitigation Center (2016) and United States Geological Survey (2015)									

According to the SPI data (Figure 3.4), average rainfall levels in the Niger area were above normal for all of the RMS period and mostly so for the Burkina Faso area. However, the beginning of the period was marked by a sharp drop-off in streamflow (water on the ground) in both areas (Figure 3.5) followed by above-normal stream flows during the rest of the RMS period. For the Burkina Faso area, these patterns ultimately manifested in a drop in vegetation coverage below normal and into agricultural drought territory (<=24) at the beginning of the RMS period. However, the vegetation deviation for the Niger area was above normal despite the short-lived streamflow drought just prior to round 1.

Table 3.4 reports the total rainfall, streamflow and vegetation deficits and surpluses for the two months prior to each RMS round by project area.

Climate Deficits

Starting with deficits, it shows that neither of the program areas experienced substantial enough deficits in rainfall itself to be classified as exposed to meteorological drought. However, in both the majority of villages experienced streamflow droughts—61 percent in the Burkina Faso area and 72 percent in the Niger area. In the Burkina Faso area, the streamflow deficits were strong enough that almost all sample villages there experienced agricultural drought (associated with vegetation deficits) in round 1; just over 60 percent did so in round 5. These streamflow and vegetation deficits may have been spurred by the poor timing of rainfall cited by 73 percent of households in RMS round 2 (see Table 3.2)

Climate Surpluses

Turning next to climatic surpluses, the AFDM data concur with FEWSNET reports of heavy flooding in the Niger program area between rounds 1 and 2. In fact, according to the AFDM data, 100 percent of Niger villages experienced flooding associated with excessive rainfall between the first two RMS rounds. Varying percentages of households experienced streamflow flooding in subsequent rounds in both project areas.

Table 3.4 Climate shock exposure data from the African Flood and Drought Monitor for RISE RMS sample villages, by program area

	Rainfall						Streamflow						Vegetation	
	Drought			Flooding			Drought			Flooding			Drought	
	Total rainfall deficit	Meteor-ological drought (%)	Severe drought (%)	Total rainfall surplus	Flooding (%)	Severe flooding (%)	Total streamflow deficit	Stream-flow drought (%)	Severe drought (%)	Total streamflow surplus	Flooding (%)	Severe flooding (%)	Total vegetation deficit	Agricult-ural drought (%)
All (N=36)														
Round 1	0.0	0.0	0.0	1.1	0.0	0.0	61.1	66.7	61.1	5.5	8.3	0.0	14.7	47.2
Round 2	0.06	0.0	0.0	1.19	61.1	5.6	1.15	2.8	0.0	46.1	38.9	19.4	0.3	0.0
Round 3	0.12	0.0	0.0	0.29	11.1	2.8	3.1	2.8	0.0	48.1	38.9	30.6	3.7	11.1
Round 4	0.28	0.0	0.0	0.65	13.9	13.9	3.2	2.8	0.0	42.9	41.7	27.8	1.4	5.6
Round 5	0.18	5.6	0.0	0.55	0.0	0.0	1.9	0.0	0.0	38.2	33.3	2.8	18.3	41.7
TOTAL	**0.64**			**3.78**			**70.5**			**180.8**			**38.4**	
Burkina Faso (N=18)														
Round 1	0.0	0.0	0.0	1.1	0.0	0.0	58.6	61.1	50	1.3	0.0	0.0	29.0	94.4
Round 2	0.07	0.0	0.0	0.84	22.2	5.6	1.7	5.6	0.0	44.9	50	11.11	0.2	0
Round 3	0.17	0.0	0.0	0.24	5.6	0.0	5.3	5.6	0.0	45.2	38.9	33.1	4.3	11.1
Round 4	0.37	0.0	0.0	0.031	0.0	0.0	5.4	5.6	0.0	35.5	38.9	27.8	2.2	11.1
Round 5	0.1	0.0	0.0	0.61	0.0	0.0	0.3	0.0	0.0	38	38.9	0.0	29.5	61.1
TOTAL	**0.71**			**2.82**			**71.3**			**164.9**			**65.2**	
Niger (N=18)														
Round 1	0.0	0.0	0.0	1.06	0.0	0.0	63.5	72.2	72.2	9.7	16.7	0.0	0.5	0.0
Round 2	0.05	0.0	0.0	1.5	100	5.6	0.64	0.0	0.0	47.3	27.8	27.8	0.4	0.0
Round 3	0.075	0.0	0.0	0.34	16.7	5.6	0.9	0.0	0.0	51.1	38.9	27.8	3.1	11.1
Round 4	0.19	0.0	0.0	1.3	27.8	27.8	1.04	0.0	0.0	50.3	44.4	27.8	0.5	0.0
Round 5	0.25	11.1	0.0	0.48	0.0	0.0	3.5	0.0	0.0	38.4	27.8	5.6	7.0	22.2
TOTAL	**0.57**			**4.68**			**69.6**			**196.8**			**11.5**	

Note: Values refer to the situation in the two months prior to each round., with percentages refering to percentages of villages.

See section 3.2 for units of measure for the total rainfall, streamflow and vegetation measures.

a/ Not available in the AFDM data base.

These insights from satellite data concur with the reports from households themselves that the Burkina Faso area was more exposed to drought conditions over the RMS period while the Niger area was more exposed to flooding. They show periods of covariate climate shocks within the program areas and others where idiosyncratic shocks affected only some villages within an area.

3.3 Summary Indicators of Shock Exposure from Household and Satellite Data

Values of the main shock exposure indicators used in the rest of this report from both satellite and household-reported data are given in Table 3.5. Both sources of data confirm that the Burkina Faso area experienced greater drought stress and the Niger area greater flooding stress. Again, the overall shock exposure index, including non-climate shocks, was considerably higher for Burkina Faso households.

Table 3.5 Summary indicators of shock exposure over the RMS 2018-19 period, by program area

Indicator (means)	All	Burkina Faso	Niger
From African Flood and Drought Monitor data			
Climatic deficits			
Cumulative rainfall deficit	0.64	0.71	0.57
Cumulative streamflow deficit	70.5	71.3	69.6
Cumulative vegetation deficit	38.4	65.2	11.5
Drought (% of villages)			
Meteorological drought	5.6	0.00	11.1
Streamflow drought	66.7	61.1	72.2
Agricultural drought	58.3	94.4	22.2
Climatic surpluses (excesses)			
Cumulative rainfall surplus	3.8	2.8	4.7
Cumulative streamflow surplus	180.8	164.9	196.8
Flooding (% of villages)			
Meteorological flooding	61.1	22.2	100
Streamflow flooding	47.2	50	44.4
From household self-reported data			
Overall shock exposure index (mean across rounds)	7.8	10.6	4.3
Too little rain (% of hholds)	45.5	71.0	18.1
Lack of rain at a critical time	48.9	74.3	21.5
Too much rain	47.8	43.4	52.5
Rain at wrong time	27.5	31.7	23.1

Note: See section 3.2 for units of measure for the cumulative rainfall, streamflow and vegetation measures.

3.4 Household Coping Strategies: Perspectives from the Quantitative Data

Table 3.6 provides a comparison across the RMS rounds of the coping strategies households reported using in response to the shocks they faced in the previous two months. The percentages of households employing the coping strategies in the year prior to round 1 (using 12-month recall) are also given for reference.

The most commonly-employed coping strategies used across the RMS period were: selling livestock, drawing down on savings, reducing the number of meals eaten in a day, limiting portion sizes at mealtimes, and reducing regular household expenses.

Other prevalent strategies were sending livestock in search of pasture and water, migration of some family members, receiving money or food from family, borrowing money from friends or relatives, "hunting, foraging, fish, exaction of termite mounds", selling productive assets, and consuming seed stock. The latter two are negative coping strategies that undermine the ability of households to cope with shocks in the future. Sending children to work for money, borrowing money from moneylenders, and taking children out of school were other negative coping strategies employed by households. These strategies were employed by significant minorities of households.

Migration (of some family members) and consuming seed stock were much more commonly used as coping strategies in the Niger than Burkina Faso project area. On the other hand, selling productive assets, drawing down on savings, borrowing money from friends/relatives, and reducing regular household expenses were more common in the Burkina Faso project area. The latter is likely due to the stronger degree of shock exposure in the Burkina Faso area.

Note that the average percentage of households employing the various coping strategies was relatively higher in the Burkina Faso area in round 2 than the other rounds, a reflection of the much greater shock exposure of that round (see above). By contrast, that average percent for the Niger area is fairly constant across the rounds.

Table 3.6 Comparison of percent of households employing various shock coping strategies across the RMS rounds, by program area

Indicator	All					Program area									
						Burkina Faso					Niger				
	Round 1 (12m recall)	Round 2	Round 3	Round 4	Round 5	Round1 (12m recall)	Round 2	Round 3	Round 4	Round 5	Round1 (12m recall)	Round 2	Round 3	Round 4	Round 5
Management of livestock															
Send livestock in search of pasture and water	30.0	19.8	19.5	23.7	31.4	35.3	25.3	16.4	12.9	18.2	24.1	13.4	23.1	35.8	44.4
Sell livestock	47.0	45.0	25.7	25.8	27.1	36.5	47.8	25.2	23.4	19.6	58.4	41.8	26.1	28.4	34.5
Slaughter livestock	19.1	9.6	4.6	3.6	3.5	13.7	5.8	2.2	0.0	0.2	25.0	13.9	7.3	7.6	6.7
Strategies to get more food or money															
Labor strategies															
Take up new wage labor	7.4	1.4	1.6	0.9	0.9	6.7	0.9	1.4	0.2	0.6	8.1	1.9	1.7	1.7	2.4
Send children to work for money	21.6	5.4	2.9	3.5	3.5	9.1	1.5	1.0	0.2	0.2	35.2	9.9	5.1	7.2	6.4
Migration															
Migration of some family members	44.8	17.9	22.0	21.8	21.8	27.7	11.4	10.7	8.2	5.8	63.5	25.5	35.0	37.0	41.1
Migration of the whole family	1.9	0.7	0.3	0.2	0.2	2.3	0.3	0.5	0.3	0.0	1.3	1.1	0.0	0.2	1.4
Send someone to stay with relatives	11.9	5.5	6.4	3.7	3.7	10.5	7.2	11.6	5.9	6.3	13.4	3.4	0.5	1.2	3.5
Sell or lease out assets															
Sell household items (e.g., radio, bed)	22.2	10.2	8.6	9.0	9.0	6.4	5.0	12.9	12.7	16.8	39.5	16.3	3.7	4.9	3.8
Sell productive assets (e.g., plough)	38.8	24.9	20.3	21.8	21.8	33.3	29.4	28.4	28.9	28.1	44.9	19.7	11.1	14.0	16.1
Lease out land	10.5	1.4	0.5	1.2	1.2	1.8	1.3	0.1	0.2	0.2	20.1	1.4	1.0	2.3	3.7
Borrow money or rely on savings															
Borrow money from an institution/association/ microfinance NGO	7.3	2.7	1.6	1.4	1.2	7.6	4.3	2.0	1.8	1.5	6.9	0.9	1.1	0.9	0.9
Borrow money from a bank	1.1	0.4	0.1	0.2	0.2	1.1	0.4	0.3	0.4	0.2	1.1	0.4	0.0	0.0	0.2
Borrow from a money lender	13.4	10.1	6.7	4.3	6.4	1.1	4.9	5.6	2.2	2.7	26.9	16.3	7.8	6.6	10.1
Draw down on savings	54.9	41.4	26.1	24.5	28.1	54.0	58.5	37.3	35.9	41.3	55.9	21.5	13.4	11.7	14.9
Rely on formal sources of assistance															
Receive food aid from government	16.4	7.0	1.3	0.3	1.7	16.1	11.0	1.8	0.2	0.6	16.8	2.2	0.8	0.3	2.9
Receive food aid from an NGO	8.7	6.3	1.4	0.4	0.5	6.8	10.5	1.5	0.8	0.8	10.8	1.4	1.2	0.0	0.1
Participate in food/cash-for-work	15.6	2.8	0.1	2.3	1.7	10.3	2.8	0.0	2.2	0.5	21.5	2.7	0.2	2.5	2.8
Rely on assistance from friends/relatives															
Receive money/food from family	36.2	18.2	9.9	9.9	10.5	30.8	19.8	8.4	9.4	4.0	42.1	16.3	11.6	10.4	17.0
Receive remittances from relative	22.6	10.4	10.5	9.6	13.7	8.9	9.1	9.2	6.7	6.9	37.7	11.8	11.9	12.8	20.6
Borrow money from friends/relatives	53.0	33.2	24.6	27.8	27.4	50.7	35.8	32.1	33.4	32.7	55.5	30.2	16.1	21.5	22.1

Cont.

Table 3.6 (continued)

Indicator	All					Program area									
						Burkina Faso					Niger				
	Round 1 (12m recall)	Round 2	Round 3	Round 4	Round 5	Round1 (12m recall)	Round 2	Round 3	Round 4	Round 5	Round1 (12m recall)	Round 2	Round 3	Round 4	Round 5
Strategies to reduce current expenditure															
Reduce food consumption/change source															
Eat lean season food (Anza, etc.)	29.3	7.3	0.1	0.2	3.4	22.8	7.5	0.3	0.0	0.0	36.4	7.1	0.0	0.5	6.7
Hunting, foraging, fishing, excavation of termite mounds	32.6	20.0	15.5	9.2	14.5	2.9	0.9	0.2	0.3	0.0	65.0	42.3	32.9	19.1	29.0
Consume seed stock	52.9	5.0	10.3	16.9	25.6	40.8	6.9	2.6	15.7	32.2	66.1	2.8	19.0	18.2	19.0
Reduce number of meals in a day	74.5	48.3	33.2	46.7	55.6	65.9	57.9	31.7	44.0	47.4	83.9	37.2	34.9	49.8	63.7
Limit portion sizes at mealtimes	79.0	52.3	36.2	52.9	70.8	68.6	64.2	41.3	56.5	65.1	90.3	38.5	30.3	48.8	76.4
Take children out of school	4.2	2.6	1.7	1.7	3.6	4.8	4.9	3.0	1.1	3.1	3.5	0.0	0.1	2.5	4.0
Reduce regular household expensies, including moving to less expensive housing	81.6	56.2	39.0	39.8	43.6	86.1	79.9	59.3	49.5	54.4	76.7	28.6	15.9	29.0	33.0

3.5 Shocks and Coping Strategies: Qualitative Findings

In this section the qualitative data collected at the same time as the quantitative data are used to gain a fuller understanding of the evolution of shocks and of the coping strategies employed by households to deal with them. Qualitative respondents were asked to give their perspectives on the interventions implemented as part of the RISE project, which are also included here. The qualitative findings are summarized first for Burkina Faso and then Niger.

3.5.1 Qualitative Findings for the Burkina Faso Program Area

3.5.1.1 Round 1 (August 2018)

Shocks

The first round of the RMS was conducted in August during the rainy season. Qualitative survey respondents reported that many households had experienced drought conditions in May-July or lack of rainfall at a critical time when the grain was growing. All three regions were affected. The drought conditions created a situation where there was not enough water and fodder for the animals. Flooding was also a problem for some villages in the Centre-Nord and Est regions. High rainfall in late July was accompanied by high winds in Centre-Nord region causing lodging that destroyed the grain crop. The floods destroyed some homes and fields in the Centre-Nord region (male FGD Centre-Nord).

Starting in June/July, livestock diseases were also a problem for both cattle and small ruminants (male FGD Sahel). Some FGD participants felt that the diseases were related to the food and water shortages (Male FGD Est). Households lost many animals.

Due to poor harvests the previous year, many households were running out of food stocks and were forced to buy food at high prices in the market.

Army worms were also attacking grain crops starting in June in Centre-Nord. The army worms attacked the seedlings, forcing farmers to replant. Army worms also attacked maize fields in the Est region (male FGD Est).

Access to drinking water was also a problem for one village in the Sahel region. The pump broke on a well, and women were forced to walk five kms both ways to fetch water several times a day.

Malaria was also a problem in the Centre-Nord region. According to one female FGD in the region, malaria cases started showing up in July and were affecting children and pregnant mothers.

Coping Strategies

The main way that the people coped with food shortages was to sell small ruminants and buy maize in the market. Men were reluctant to sell cattle because this would require buying large quantities of grain when prices were very high (male FGD Sahel). These ruminant sales have a negative effect on women's assets because they are the primary owners of small ruminants.

Men were migrating to other towns to look for work or seeking employment in gold mines. Women left in the village felt abandoned and left to fend for the children (see quote to right). They are more restricted in their movement, which has a negative effect on income generating activities (female FGD Centre-Nord). Women were also engaged in petty trade of food stuffs.

People also coped by reducing consumption from three meals a day to two. Many households took out loans from merchants to buy food or borrow from friends and relatives.

Box 2: Quote from female KII in Centre-Nord

"Does a man worry about you even when you do not have enough to feed the family?"

People were also consuming more wild leaves. It is not always possible to find grain in the market at reasonable prices. The government provided subsidized grain to the poor and most needy, and people were also consuming their seed stock (female FGD Centre-Nord).

To deal with animal diseases, households that could afford it vaccinated their animals using vets from Gayeri or used traditional medicines that were not very effective (male FGD Centre-Nord).

Box 3: Quote from male FGD Est

When asked why they borrow from merchants they replied:
"If you don't have the strength to fight a thief, you have to help him bring back what he stole from your house."

In the Sahel region where the water pump broke down in one village, villagers advocated with the local government to replace the pump. They also started a fund to repair the pump themselves. They were trying reduce the burden on women who were fetching water (male FGD Sahel).

To address army worms, households turned to agro-chemicals which are very expensive and not that effective. Many did not feel that they had an effective approach to deal with army worms (male FGD Est).

RISE Interventions

Qualitative survey respondents reported that the RISE program was very active in providing training in agricultural techniques (composting, water harvesting, the distribution of short cycle sorghum and bean seed), and herd management of livestock. The program also provided training on nutrition for pregnant and lactating women, and supplied food to women and children (oil, flour and peas). It also provided loans to women to buy grain. In the Sahel region the RISE program provided support to improve access to drinking water through the drilling of new wells.

3.5.1.2 Round 2 (October 2018)

Shocks

The round 2 survey was carried out during the harvest time. Rainfall was very erratic in the rainy season, with a major dry spell that occurred during most of September in all three regions

that dried out the crops (sorghum and maize) at a critical time. This was followed by flooding in late September in Centre-Nord region that destroyed several houses and flooded lowland fields. Such erratic rainfall had a negative impact on production. Violent winds in October also caused the millet to lodge in both Centre-Nord and Est regions. Army worms were also attacking the bean and corn fields since late August in both the Est and Centre-Nord regions.

Because of the poor harvests from the previous year, food stocks had run out in all three regions (male FGD Est). People were relying on purchased food since January since the previous stocks had run out. Prices for grain purchases were high.

Livestock diseases were also a problem during this round. Due to fodder and water shortages because of the drought conditions, animals were weaker and got sick easier. Cattle were suffering with wounds on their hooves and skin since August, and small ruminants were suffering from diarrhea. Poultry were also suffering from New Castles disease (male FGD Centre-Nord).

Drinking water continued to be a problem in the Sahel and now was a problem in one village in Centre-Nord due to a broken pump. Women were waiting six hours at a pump to obtain water.

Malaria was also a problem in the Centre-Nord and Est regions, becoming worse at the end of August, early September. Children and pregnant women were the most vulnerable and had to be treated at the health clinics.

Coping Strategies

To meet food needs, households relied on wild leaves, borrowing money from friends and relatives, or taking out credit from wealthy households and going into debt (male FGD Centre-Nord). Many acknowledged that it is embarrassing to ask for food. They also reluctantly sold animals to buy food. Many households were reducing the number of meals they consume in a day. The poor also worked in other people's fields for food.

Women engaged in petty trade such as selling pastries on market day. The poorest families collected waste flour from the mills (female FGD Centre-Nord).

To deal with animal diseases, those that could afford it vaccinated their animals or used traditional medicines to treat the animals. Those households with many animals moved their animals to other areas with more fodder and water (male FGD Est).

To deal with malaria, they went to the health clinics to get treatment, especially for children and pregnant mothers.

In the Centre-Nord and Sahel regions, to deal with water shortages communities worked together to dig wells in the low areas. To deal with drought, people in a community in Est region came together to ask the religious leaders to implore the spirits for rain. The strategy worked because it rained the next day (male FGD Est).

RISE Interventions

Respondents reported that during this period the RISE program provided training on nutrition interventions (enriched porridge) and on health and hygiene, and distributed mosquito nets to address malaria. They also gave training in how to build stone barriers for water catchments and gave advice on plant protection products to protect beans from army worms. Some FGD participants stated that the interventions promoted did not provide helpful advice on how to deal with floods (male FGD Centre-Nord).

3.5.1.3 Round 3 (December 2018)

Shocks

Round 3 was carried out in December, nearing the end of the harvest season. Most households in the three regions of Burkina Faso had run out of food due to poor production stemming from erratic rains, and most were purchasing food on the market. Livestock diseases were still common, which affected cattle (loss of appetite, goose bumps), small ruminants (diarrhea) and poultry (New Castle). Malaria was still a problem facing children and pregnant mothers. Water shortages were still a problem for villages in Centre-Nord and the Sahel regions.

By round 3, **violent extremism** also started to become more prevalent in the Est region (male FGD Est). Villages nearby were being attacked, and this forced the teachers to leave the schools. As a result, the schools closed. One school was also burned down by the extremist.

People were becoming more desperate and living in constant fear of being attacked. They were also stressed because they could not send their children to school and did not know what to do. They became pessimistic about their future and did not have a solution to this problem.

Coping Strategies

To cope with food shortages, households sold small ruminants to buy food, asked for help from family and friends, took out loans, and reduced the number of meals consumed in a day. They also relied on a National Social Security Fund to provide loans to buy food (male FGD Central North). One strategy was to buy food on the market at low prices and rely on own food stores when prices go up.

To address animal diseases, households that had money vaccinated their animals or relied on traditional medicines. They also tried to keep animal enclosures clean so that the animals did not get sick. When animals were sick, they tried to sell them in the market at low prices to avoid a complete loss (male FGD Est).

In situations where the pump was broken leading to a shortage of water, women travelled long distances to reach a water source and still had to wait a long time in a queue. This situation could create domestic disputes and lead to domestic violence because the women did not have time to do their other household chores (female FGD Centre-Nord). Several households contributed resources to repair the pump. Some villages in the Sahel region continued to dig shallow wells in the low areas.

The people that were exposed to violent extremism did not have a strategy to cope other than to avoid traveling alone in vulnerable areas and not talking to strangers.

RISE Interventions

During this round respondents reported that the VIM project was providing food and supplements to poor families with children and pregnant mothers. They also provided household hygiene training, malaria prevention (mosquito nets), and training in how to keep animal pens and chicken coops clean to reduce disease (male FGD Est). One KII stated that they were not sure what the RISE program can do to address violent extremism (KII Est).

3.5.1.4 Round 4 (February 2019)

Shocks

Round 4 was carried out just after the usual main harvest period (see Figure 3.1). Due to poor harvests, households continued to buy food in the market. People were experiencing respiratory illness, and malaria was still a problem in several villages. Animal diseases were still an issue, with small ruminants suffering tremors and goose bumps, donkeys developing respiratory problems, and poultry having New Castle disease.

Violent extremism spread to another region--Centre-Nord as well as the Est Region. The local authorities were attacked in on area in Centre-Nord during this period. Schools continued to remain closed in the Est region.

Coping Strategies

To cope with food shortages, households sold small ruminants, borrowed from friends and relatives, sold firewood, engaged in petty trade (selling mats), and reduced food consumption. Men migrated to cities for work and/or looking for gold mining opportunities.

To deal with the violent extremism, villages were implementing a 7:00 pm curfew and asking people to not talk to strangers (male FGD Centre-Nord). To try to get the teachers to return to villages in the Est region, a delegation was sent to Gayeri (the regional capital) to take the issue up with the local authorities. There had been no follow up by the time of the survey.

To deal with animal diseases, people with money vaccinated or relied on local medicines.

RISE Interventions

Qualitative survey respondents reported that the VIM project continued to provide training on the importance of hygiene for the health of both people and animals. The people exposed to violent extremism were discouraged that there were no interventions that address these types of shocks.

3.5.1.5 Round 5 (April 2019)

Shocks

Round 5 was carried out in April 2019, two months before the typical beginning of the agricultural lean season. Food shortages due to poor harvests were still a major issue for all three regions in Burkina Faso. Food purchases were still the main way people were feeding themselves during this round.

Violent extremism had become a big issue, especially in Centre-Nord. There were several attacks in the previous several months, including on a nearby police station. A village nearby one of the villages surveyed had been attacked in the previous month. This led to all schools being suspended in the area. People felt that they could get attacked any time (male FGD Centre-Nord). Villagers reported the violence to the local administration, but nothing had been done by the time of the survey. Men could not go out looking for work for fear of being attacked.

Water shortages became a problem in all three regions. In Centre-Nord women were spending 11 hours a day fetching water. They had to wake up at 4:00 am to begin fetching water. The main problem is that there was not enough water to serve everyone because the number of water pumps was limited. Many boreholes had dried up. This same problem existed in the other two regions. People were being forced to pay for water. Fights broke out between women over water.

Animal diseases were still cited as a problem in round 5, including disease among donkeys, small ruminants and poultry. There was also a lack of fodder and water for animals, making them weak and susceptible to disease. To deal with the lack of fodder, households were buying bran from the millers and/or feeding animals millet stems.

Access to wood for cooking had also become a problem in Centre-Nord. It arose because the government environmental service office was restricting the harvest of wood from state forest lands. To cut wood people had to go to Kaya to get a wood cutting permit which was only valid for three days (KII Centre-Nord). Since women are responsible for gathering wood for cooking, this placed additional constraints on their time.

Coping Strategies

To deal with food shortages, the same types of strategies that were used in other rounds were used in round 5. People sold their animals to buy food, took grain credit from merchants which were paid back with interest, engaged in petty trade, and reduced food consumption (male FGD Est).

To deal with the violent extremism, people tried to avoid unnecessary movement, avoided talking about terrorism in public, and kept their children close. Everyone had become careful where they go and who they associate with. They felt powerless to the potential of being attacked. They felt that they had lost their peace. They could no longer go about their daily business without being scared.

To deal with water shortages, villagers contributed funds to build additional water sources. They also asked OCADES for an additional borehole (male FGD Centre-Nord). Some of the better off families travelled to Niger to obtain water (male FGD Sahel).

As in other rounds, the main strategies used to deal with animal diseases were to vaccinate animals if a household could afford it or to use traditional medicines. Women were the most impacted by the death of donkeys and small ruminants (female FGD Est).

RISE Interventions

Qualitative respondents reported that most of the RISE program interventions carried out at this time focused on nutrition interventions aimed at women. Again, the program had not provided any ideas on how to deal with the violent extremism.

3.5.2 Qualitative Findings for the Niger Program Area

Qualitative data were only collected in two of the Niger program area regions: Zinder and Maradi. They were not collected in the third, Tillabery, where as noted above violent extremism was a rising problem over the RMS period.

3.5.2.1 Round 1 (August 2018)

Shocks

The first round of the RMS was carried out in during Niger's rainy season, coinciding with the agricultural lean period (Soudoure). This period in both Zinder and Maradi was characterized by insufficient rainfall early in the season that led to multiple crop plantings and too much rain at the end of the season that led to flooding. Farmers who planted in the lowlands (washes) to compensate for drought were flooded out at the end of the rainy season. Strong winds in Maradi also affected many villages, leading to lodging of millet. The floods not only destroyed crops but also led to the destruction of homes and the deaths of many animals. Production was seriously affected. Fire also broke out in a village in Maradi and destroyed 20 houses.

Farmers blamed the erratic rains for the surge in animal diseases. The drought conditions at the beginning of the rainy season led to shortages of water and fodder for animals making them weak. The heavy rains at the end of the season led to more cattle diseases and wide spread diseases affecting small ruminants and poultry. Cattle died from diseases referred to as "Safa" or "Booro". Farmers tried to save their animals through both private and public veterinarian services, but much of this help came too late. Others who could not afford livestock services tried traditional medicines, but many animals still died. Poultry suffered from New Castle disease or "Katou or Kwatou", which is endemic and occurs every year. Several FGDs in Maradi stated that the rains were associated with the livestock diseases, particularly pneumonia or "tchiwon souhe" and fever.

There was also a meningitis epidemic in a village in Zinder that killed 10 children. The rising number of cases of malaria seen in later rounds also began to appear.

The drought conditions also led to the early movement of animals coming from Nigeria which caused a lot of damage in the fields (FGD Maradi). The villagers were not able to prevent this because the cattle herders had guns. People contacted the authorities, but nothing was done to protect their fields. In addition, many of these animals are not vaccinated and likely infected the local cattle in Maradi.

Coping Strategies

To cope with the animal diseases, many farmers tried to sell the animals before they died (male FGD Maradi). This led to situation where multiple households were trying to sell sick animals at the same time, which led to a worsening of the terms of trade. One KII informant in Maradi stated that they were only able to get 5000 CFA for a cow.[13] Another KII from Maradi stated, "I have even tried to abandon two cows in the market because I could not take them back to the village and no one wanted to buy them." The price of small ruminants also dropped dramatically.

Box 4: Quote from KII in Maradi

"This year the price of animals has been so low that even the money from selling three goats can't buy a bag of corn."

Women are especially impacted by the death and sale of small ruminants since they have primary responsibility for taking care of sheep, goats and poultry. To purchase food in the market to make up for the poor harvest it is usually women's animal assets that are sold to feed the family. Women also do not have the resources to vaccinate the small ruminants, making them more vulnerable to disease. As one female key informant from a village in Maradi stated, "…it is a huge loss for households since it is these resources that we use for big expenses".

In addition to selling animals to buy food to make up for the poor production, households turned to a number of other strategies to cope with shortfalls. Based on FGDs in Zinder and Maradi, coping strategies employed by households were to harvest immature millet, take out loans, seek out paid labor in other fields and abandon their own fields (especially the poor), migrate for work in larger towns or Nigeria (men and youth), mortgage fields to wealthier farmers, and ask for help from relatives. As one KII in Maradi stated, "sharing food with relatives makes them all vulnerable". In one village in Maradi, the women's FGD indicated that sharing has decreased. The government has also tried to help farmers by selling cereals at subsidized prices (50% less).

The Soudure period right before harvest is a very difficult time for many households. Many people take out loans at this time and get into debt.

To manage the effects of the flooding in both Zinder and Maradi, affected families were taken in by other families or housed at the school. Help was also provided by the government authorities in the form of blankets, food and clothing.

[13] West African CFA francs.

Box 5: Quote from KII in Maradi

"It is important to have multiple strategies to cope with food shortages during this period; a single strategy is not enough."

In terms of community collective action, villagers banded together in one village in Zinder to repair wells, build dikes for flood control, and build and repair a school. They also pooled resources to buy medicine for the health center. In another village in Zinder, the villagers worked together to establish a better drinking water supply with the help of PASAM TAI. In a village in Maradi, villagers got together to build a house for a nurse at the health clinic and repaired a school and a mosque. This same village constructed a corridor through the village farm land to enable the passage of pastoral animals coming from Nigeria in order to avoid conflict. They also mobilized aid for fire victims. In two other villages in Maradi, the chiefs organized the villagers to repair wells.

RISE Interventions

Villagers in both Zinder and Maradi reported that the programs being implemented under the RISE umbrella have introduced new farming techniques through farmer field schools, for example new cultivation techniques, composting, use of organic fertilizer, bio control for pests, livestock interventions, improved seed, nutrition programs, and water catchment techniques. Social welfare fund groups and savings programs were also introduced. Several FGDs in many villages in Maradi stated that farmers did not always have the resources to implement the activities that they were being taught on their own fields due to the need to seek employment on other people's fields to buy food. Also, many of the poor farmers were not able to purchase recommended fertilizers or pay for vet services.

3.5.2.2 Round 2 (October 2018)

Shocks

The shocks that were experienced between rounds 1 and 2 of the RMS, which was during the harvest time, are interrelated with the shocks that were experienced in round 1. First, FGDs in both Zinder and Maradi stated that the harvest was insufficient due to poor rainfall patterns experienced earlier. Some stated that the harvest may only last two months. Due to the late heavy rains at the end of the rainy season, there was an outbreak of armyworms (Tsousa) on the millet, maize and beans, and aphids (Kwari) on the cowpeas. The phyto-sanitary products used to fight against these pests were ineffective and expensive (male FGD Maradi).

Animal diseases continued to plague villages in both Zinder and Maradi, affecting both cattle and small ruminants. The late rains were blamed for the persistence of these diseases. Traditional methods for treating the animals did not work, and the use of livestock vet agent to treat animals was expensive.

Malaria became endemic in both Zinder and Maradi due to the late rains, which had the biggest effect on children and pregnant mothers. FGDs in both Zinder and Maradi said a few children had died from the disease and some women had experienced miscarriages.

Coping Strategies

To cope with food insecurity, households consumed immature millet for two weeks prior to harvest, took out loans from traders to buy food (cassava flour), ate leaves, sold livestock, mortgaged fields to better off families, and sought work from others in the village. Older children migrated to seek work (FGD Zinder). A good portion of what crops were harvested was used to pay back debt to avoid risking conflict with creditors. This left less millet to put in storage to eat during the winter months.

In terms of malaria, children were taken to the clinics to be treated since treatment was free for them (Female FGD Maradi). If adults were to be treated, they had to sell crops or animals to pay for the treatment. Purchase of drugs in the market for treatment of malaria often did not work because the drugs were often counterfeit. Families that did have access to mosquito nets used these to prevent getting malaria.

To address animal diseases, they used vet services if they could afford them or relied on traditional medicines that did not work very well. Many cattle, goats and sheep continued to die in large numbers.

RISE Interventions

According to qualitative survey respondents, the projects implemented under the RISE program continued to teach farmers new agricultural and livestock techniques through farmer field schools. They also distributed mosquito nets to families and malaria prophylaxis pills to pregnant women. In addition, the projects taught women new hygiene techniques to make sure standing water was not available for breeding more mosquitos. One concern that was voiced by several members in the FGDs in both Zinder and Maradi was that the interventions being promoted did not adequately address the problems associated with too much rain.

3.5.2.3 Round 3 (December 2018)

Shocks

Between rounds 2 and 3 most of the people in the focus groups in both Zinder and Maradi complained about animal diseases affecting cattle (a type of lung disease), small ruminants (serious diarrhea) and poultry, especially Guinea fowl. Human diseases such as malaria were still prevalent, but now people were also affected by chicken pox, the flu and other respiratory problems. Pinkeye was also common among children. In some villages in Maradi, people were already running out of food stocks due to poor harvests.

Coping Strategies

To address livestock diseases, people continued to seek out vet services and rely on local medicines. Vet assistants were trained up by the RISE program to help with treatment (male FGD Maradi). In some villages in Maradi, households were more systematically vaccinating their animals with some assistance provided by the government. In Zinder, one traditional treatment for cattle is to make an infusion from roots of a plant that grows in the shade of the GOO tree

(male FGD Zinder). However, members of the same FGD said that such traditional treatments do not work.

Similar to the findings in round 2, malaria cases (especially for children) are treated at the clinic. To pay for malaria treatment of adults some households rely on a cash fund (tontine) to borrow money which they pay back. People try to prevent malaria through the use of mosquito nets and keeping the village clean of stagnant water. Cold and flus and pinkeye are treated with medicines obtained at the shops.

To deal with food shortages, some women in villages in Maradi worked for money in the nearest town (female FGD Maradi). They did laundry and housekeeping to earn some money to buy the family some food.

RISE Interventions

In addition to the agricultural and livestock training provided by the RISE projects in the farmer field schools, qualitative respondents in Zinder and Maradi also reported training of veterinary assistants from the villages to treat animals when they get sick. Also, women were being trained in health awareness for pregnant and lactating women, hygiene techniques to reduce malaria, and family planning. Mosquito nets were also being distributed.

3.5.2.4 Round 4 (February 2019)

Shocks

The round 4 survey was carried out just following the end of the harvest season. Given the poor harvest, food stocks are running out in both Zinder and Maradi villages. People were being forced to buy food in the market much earlier than usual. Because of the huge demand, prices were going up, which is essentially another shock (male FGD Maradi). People were desperately looking for work to buy food.

Animal diseases were still affecting cattle, sheep and goats. Also, during this round, theft of animals was increasing as people become more desperate (male FGD Zinder). People on motorcycles were steeling small ruminants. The villagers thought that many of the thieves were youth coming from Nigeria who were using the money to buy narcotics. Thieves were also steeling millet from the farm stores.

Children were suffering from measles or chicken pox in both Zinder and Maradi. Respiratory illnesses were still prevalent in the villages surveyed.

Coping Strategies

To deal with food shortages due to last season's poor production, people began reducing the amount of food they consumed. Women started gathering wild leaves for consumption (*Leptadenia hastata, Tapinenthus globifrus, Tapinenthus dadoneifolius*) (Female FGD Maradi). Women also sold these wild foods for cash. Men migrated to towns to look for work (Zinder and Matameye), and young men were migrating to Nigeria, Algeria and Libya to look for work. Maize was being imported from Nigeria to meet demand. Some households were selling wood and straw. Others that had access to winter gardens were selling sugar cane, peppers, lettuce

and tomatoes. Some poorer households took care of animals belonging to wealthier households from the cities.

To deal with animal diseases people vaccinated their animals if they could afford it, or used traditional medicines (*Acacia nilotica*) (male FGD Zinder). Sick children were treated at the clinic.

RISE Interventions

According to respondents the projects implemented under the RISE program were teaching farmers new farming and livestock techniques (e.g. composting, use of fertilizer, improved water harvesting and use of improved seed). However, members of one FGD in Zinder said that they do not have the resources to implement many of the improved practices.

In Zinder, a female FGD participant pointed out that the project has been enabling women to accumulate small ruminants through the Habbanaye project (pass the goat). They appreciated this intervention since many had to sell their small ruminants to buy food.

3.5.2.5 Round 5 (April 2019)

Shocks

Due to the poor harvest from the previous year, people had run out of food and were forced to buy food in the market. They were buying corn primarily at higher prices. Animal thefts are continuing according to a male FGD in Maradi.

Coping Strategies

Box 6: Quote from member of female FGD in Zinder

"I collect and sell water to feed the children"

Given the fact that most households had used up their grain stocks, a wide variety of coping strategie s were pursued to purchase food. People were reducing consumption to one meal per day and consuming cassava flour with wild leaves. People continued to sell animals, engage in petty trade, pursue casual labor (men), borrow money from relatives, borrow money from merchants (or get grain on credit from merchants), and sell wood, straw and water. Women that engaged in petty trade would sell cabbage and moringa leaves. Young people migrated to Nigeria. In some villages in Zinder, desperate households sold or pawned their fields to get access to cash in order to eat (KII Zinder). Similar patterns are found in Maradi.

In some villages where household had access, they turned to the Soudure Bank that has been set up by a RISE project to seek help for food or seed (female FGD Zinder). Others turned to a Tontine, also set up by a RISE project, to get help to purchase food. The local government had set up local grain sales at subsidized prices in both Zinder and Maradi to help with the food shortages, but households had to go to the bigger towns to get access to this food (male FGD Maradi).

RISE Interventions

In addition to the farmer field schools that taught new agriculture and livestock techniques, respondents reported that CRS implemented the Habannaye project providing goats to women to restock the small ruminants that were sold to feed their families (female FGD Zinder). They also introduced the Soudure bank and tontines in several villages. Again, many of the members of the FGDs in both Zinder and Maradi stated that they did not have the means to implement many of the improved practices being introduced. This was especially true for those who were mortgaging or selling their land to obtain cash to buy food.

3.6 Summary

3.6.1 Shock Exposure

Shock exposure has progressively increased over the course of the RISE project and was especially high in the year prior to the start of RMS 2018-19. During the RMS period itself, the surveyed areas were afflicted by four kinds of "exogenous" shocks over which households had no control: multiple climate shocks, army worm infestations, an influx of violent extremism, and food price increases. The climate shocks were drought, excessive rains leading in some cases to severe and widespread flooding, lack of rain at critical times in the agricultural cycle, and high winds that led to lodging of crops in the field. The qualitative data confirm that the RISE program area was exposed to multiple weather- induced shocks (drought, flooding, and erratic rainfall) and their downstream effects. Violent extremism spread into all three regions in which the RISE program operates in Burkina Faso and into Tillabery in Niger. This extremism disrupted households' livelihoods, disrupted markets, led to a large influx of displaced populations, and limited access of humanitarian actors to villages. It also caused a great deal of fear and disruption of daily household life.

Some downstream impacts of the above shocks were animal disease outbreaks and deaths, lack of food and water for livestock, lack of water for household consumption, and elevated levels of human illnesses, especially malaria and respiratory illnesses. Poor harvests meant that households ran out of home-produced food earlier than usual and were forced to rely on high-priced market purchases.

Shock exposure was much higher in the Burkina Faso area than in the Niger area due to greater exposure to drought, poor rainfall timing, animal disease outbreaks, and food price increases.

3.6.2 Coping Strategies

As agricultural production has been poor for several years, people have had to rely on various strategies that have enabled them to purchase food from the market much earlier than usual. The sale of animals was one way to cope with these shortfalls, but drought conditions led to shortages of water and fodder for animals, making them weak and susceptible to various diseases. People tried to sell their animals before they died but, in aggregate, this led to poor terms of trade, making it difficult to obtain enough food in exchange for the animals. As a result,

people were forced to turn to other strategies to obtain resources to buy food such as drawing down on savings, petty trade, sale of wood and straw, sale of wild foods, casual labor in others' fields, mortgaging land, borrowing from friends and relatives, or going into debt to merchants. They also cut down on food consumption. Many of the male household members migrated in search of work. This often left the women in charge of feeding the children and elderly on very meager resources while the men were away.

Some households were forced to turn to negative coping strategies such as selling productive assets, consuming seed stalk, sending children to work for money, borrowing money from money lenders, and taking children out of school.

Water and wood shortages only exacerbated the work burden on women, forcing them to spend long hours fetching these resources at the cost of other household tasks. In some cases, this led to domestic disputes and even violence.

In the context of a precarious food security situation, a new element of uncertainty came into the program area (during round 3) in the form of violent extremism. People became fearful of venturing out, and public services were disrupted. Schools closed and security and other administrative services were curtailed or were under attack. The qualitative data showed that people felt helpless to cope with this extremism and were at a loss of what to do.

Although the RISE program did introduce a number of interventions that were viewed as helpful, many of the respondents said that they did not have the resources to implement many of the new practices they were introduced to. They were forced to work on other people's fields rather than apply the new practices to their own fields due to the need to get money to eat. Also, the program did not have a response to dealing with floods or violent extremism.

4. HOUSEHOLD FOOD SECURITY AND RESILIENCE IN THE FACE OF SHOCKS

This chapter first describes the changes in food security that took place over the RMS period in the two program areas and compares food security levels with those from the baseline and midline surveys. It then analyzes the effects of the shocks households experienced on their food security. Finally, it looks at how resilient households were to the shocks they faced, and whether their resilience has increased since the baseline.

The main indicator of food security used is the inverse of an experiential indicator of food insecurity, the Household Food Insecurity Access Scale (HFIAS) (Coates et al., 2007). This indicator is used to measure food security itself as well as *changes* in food security, the basis for one of the measures of resilience employed (see below). The HFIAS is an index constructed from responses to nine questions regarding people's experiences of food insecurity in the previous four weeks, ranging from worry about not having enough food to actual experiences of food deprivation associated with hunger.[14] The inverse of the score is taken for this analysis because a measure that increases with increasing food security is needed. The HFIAS can also be used to identify which households can be categorized as food secure, defined as experiencing none of the nine conditions, or just experiencing worry, but rarely.

One other food security indicator is reported on, the dietary diversity score (Swindale and Bilinsky, 2006), an indicator of dietary quality. It is measured as the total number of food groups, out of 12, from which food was consumed in the previous day.[15]

4.1 Changes in Food Security since the Baseline

Table 4.1 documents the changes in food security that took place between the baseline and midline, and across the five RMS rounds. Changes in the food security index, described above, are illustrated in Figure 4.1. While looking at these patterns, it is important to keep in mind the very high degree of food insecurity in the RISE project area. At baseline only 14.4 percent of households in the Burkina Faso area and 32.7 percent of households in the Niger area were

[14] The nine experiences are:
- Worry that the household would not have enough food.
- Any household member was not able to eat the kinds of foods preferred because of a lack of resources.
- Any household member had to eat a limited variety of foods due to a lack of resources.
- Any household member had to eat some foods that they really did not want to eat because of a lack of resources to obtain other types of food.
- Any household member had to eat a smaller meal than he/she felt they needed because there was not enough food.
- Any household member had to eat fewer meals in a day because there was not enough food.
- There was no food to eat of any kind in the household because of lack of resources to get food.
- Any household member went to sleep at night hungry because there was not enough food.
- Any household member went a whole day and night without eating anything because there was not enough food.
- Survey respondents indicate whether or not they or another household member experienced the event or feeling in question and, if yes, how often in the last 30 days (rarely, sometimes or often). A score is then calculated based on these frequency responses.

[15] The 12 food groups are: Cereals; roots and tubers; vegetables; fruits; meat; eggs; fish and seafood; legumes; dairy and dairy products; fats and oils; sweets (sugar, sugar cane, tamarind or honey); and other foods.

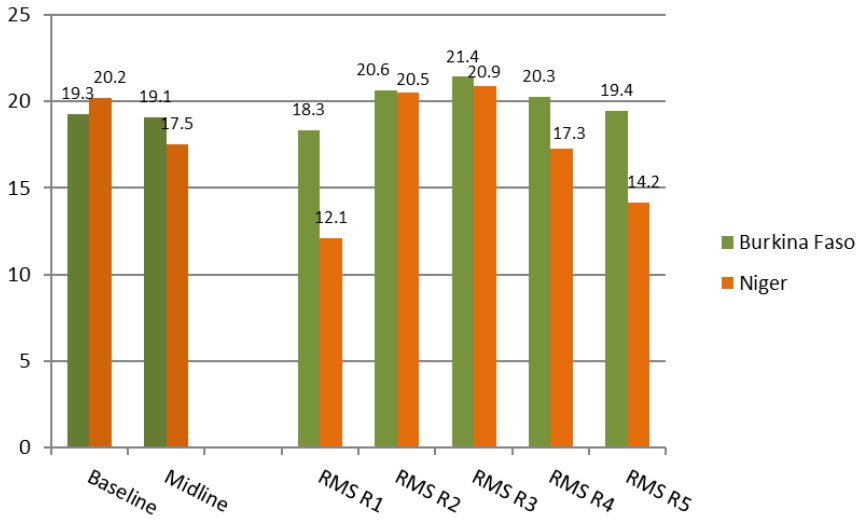
classified as food secure, with the highest percentage achieved throughout the program's implementation period being 33.5 (in Niger, RMS round 3). The large majority of households are thus food insecure by the standard HFIAS classifications. Further, a significant proportion are *severely* food insecure, meaning they are frequently cutting back on meal size or the number of meals eaten, and/or have experienced one of the following in the last month: running out of food entirely, going to bed hungry, or going a whole day and night without eating.

Table 4.1 Food security at baseline, midline and across the RMS rounds, by project area

	Baseline	Midline	RMS rounds				
			August 2018	Oct 2018	Dec 2018	February 2019	April 2019
Burkina Faso							
Food security index	19.3	19.1	18.3	20.6	21.4	20.3	19.4
Food security groups							
Food secure (%)	14.4	19.1	9.6	27.3	21.1	15.3	13.4
Mildly food insecure	10.4	10.1	9.5	18.6	17.0	19.8	14.1
Moderately food insecure	48.8	43.2	42.4	28.8	53.3	55.9	60.5
Severely food insecure	26.3	27.6	38.6	25.3	8.5	9.0	12.0
Dietary diversity score	6.00	5.22	4.24	4.50	4.43	4.20	4.13
Niger							
Food security index	20.2	17.5	12.1	20.5	20.9	17.3	14.2
Food security groups							
Food secure (%)	32.7	16.8	1.8	26.5	33.5	16.1	5.8
Mildly food insecure	6.3	9.5	2.8	8.9	8.6	4.4	3.2
Moderately food insecure	32.0	29.0	22.9	42.1	35.0	41.6	35.0
Severely food insecure	29.0	44.8	72.4	22.4	22.9	37.9	56.0
Dietary diversity score	3.76	4.66	4.08	5.05	5.09	4.61	4.51

Note: The food security index is the inverse of the Household Food Insecurity Access Scale (HFIAS). The food security groups are derived from this scale. The dietary diversity score is the total number of food groups, out of 12, from which food was consumed in the previous day (see introduction to this chapter for more detail).

Figure 4.1 Food security at baseline, midline and across the RMS rounds, by project area



Note: The food security indicator is the food security index (see introduction to this chapter for more detail)

With regard to changes in food security since the baseline, average food security across households has remained relatively stable in the Burkina Faso area. Its lowest value was 18.3 (RMS round 1) and highest 21.4 (round 3), a three-point spread.

By contrast, food security shows a highly fluctuating pattern in the Niger area, with its lowest value being 12.1 (RMS round 1) and its highest 20.9 (RMS round 3), a nine-point spread. The percent of Niger-area households who are severely food insecure also shows a highly variable pattern across the RMS rounds, falling from an extreme 72.4 percent in round 1 to 22.4 percent in round 2 before ending with 56.0 by round 5.

Consistent with the heightened shock exposure experienced in the year prior to the RMS and the beginning of the RMS period, food security was at its lowest in both program areas in RMS round 1. It increased over rounds 2 and 3 and then declined in rounds 4 and 5. In addition to the degree of shock exposure (see next section), these patterns are due to seasonal fluctuations in the agricultural cycle: the agricultural lean season typically ends in September, just prior to the round 2 data collection (see the seasonal calendar in Figure 3.1).

Note that while the food security index for the Burkina Faso area is roughly the same at baseline, midline and RMS round 5 (all for April/May), it is far lower in RMS round 5 for Niger, falling from 20.2 to 17.5 and then 14.2. The declining trend in Niger may be explained by the more negative impact of climatic deficits, especially streamflow drought, which was experienced by 72 percent of households between rounds 1 and 2, on food security there (see next section).

Dietary diversity also shows a fluctuating trend since the baseline in the Niger area. It exhibits a declining trend in the Burkina Faso area, with its value during the RMS being significantly lower than at baseline and midline. The reduction is due to decreased percentages of households consuming foods from a variety of important food groups, including roots and tubers, fruits, meats, fish and seafood, and fats and oils.

4.2 The Effect of Shocks on Household Food Security

To what extent did the shocks households were exposed to have a negative impact on their well-being, measured here as food security? Which shocks had a negative impact?

Table 4.2 reports Ordinary Least Squares (OLS) regression analysis of the association of the overall shock exposure index (the independent variable) with the food security index (outcome of interest) while controlling for household socio-demographic characteristics, livelihood group and wealth. Also controlled for is survey round, which helps to account for seasonal effects. The round-stacked dataset is employed, giving a total of 3,048 observations across the rounds.[16]

The analysis indicates that shock exposure experienced by households over the RMS period had a decidedly negative effect on their food security in both project areas. The coefficients on the shock exposure index are negative and strongly statistically significant. Applied to severe food insecurity, the analysis suggests that a 20-point increase in the shock exposure index (about one-fourth of its range) would lead to about a twelve percentage-point increase in severe food insecurity (see bottom of Table 4.2).

[16] The empirical specification is similar to that in Equation (4) (Chapter 2).

Table 4.3 focusses specifically on the effect of climate shocks on households' food security. Panel A (on the left) uses the round-stacked data set looking at shock exposure of the previous 2 months; Panel B (on the right) looks at the associations between average food security and shock exposure across the entire RMS period.

Starting with climatic deficits, the data confirm that rainfall deficits and associated meteorological drought had a negative effect on households' food security, particularly in the Niger program area (no villages in the Burkina Faso area were exposed to meteorological drought). Streamflow drought appears to have had a negative effect when it rose to extreme (severe drought) levels. While agricultural drought shows no negative effect when looking only at two-month periods (Panel A), it shows a negative effect in both program areas when looking across the entire nine months. Regression analysis using the household-reported shock data for "too little rain" and "lack of rain at a critical time" (see lower panel of table) confirm the negative effects of climatic deficits, particularly those associated with atypical rainfall timing in the Burkina Faso area.

Meteorological flooding associated with above-normal rainfall itself does not appear to have had a negative impact on households' food security. In fact, the regression analysis shows positive associations between meteorological flooding and food security in both project areas. However, streamflow flooding—which is a stronger manifestation of excessive levels of water on the ground—has a negative association with household food security in the round-stacked analysis (significant at the 10 percent level).

Table 4.2 Regression analysis of the effect of overall shock exposure (self-reported) on household food security

	All		Burkina Faso		Niger	
Shock exposure index	-0.087	***	-0.073	***	-0.087	***
Adult equivalents	0.074		0.003		0.032	
AE-squared	-0.006		0.001		-0.006	
Percent females 0-16 a/						
Females 16-30	0.021		0.023		0.020	
Females 30 plus	0.007		0.003		0.004	
Males 0-16	-0.005		-0.005		-0.005	
Males 16-30	0.006		-0.014		0.012	
Males 30 plus	0.010		-0.041		0.043	
Education: None a/						
Primary	0.055		0.612		-0.330	
Secondary	1.018	**	0.896		1.341	**
Female-adult-only hh	1.032		-0.498		2.123	**
Livelihood: Other a/						
Agriculture	0.052		-0.548		0.068	
Pastoralism	0.356		-0.360		0.723	
Asset index	0.084	***	0.023		0.165	***
Niger	-2.348	***				
Time period						
Round 2 a/						
Round 3	-0.334		-0.030		-0.571	
Round 4	-2.732	***	-1.283	*	-4.133	***
Round 5	-4.512	***	-2.013	***	-6.961	***
R-squared	0.145		0.057		0.211	
Number of observations	3,048		1564		1484	
Percent of households severely food insecure						
Shock exposure index	0.622	***	0.557	***	0.568	***

Notes: Asterisks represent statistical significance at 10 (*), 5(**) and 1(***) percent levels.
t-statistics are robust to heteroskedasticity.
a/ Reference category.

Table 4.3 Regression analysis of the effect of climate shocks on household food security

	Shock exposure over previous 2 months (Round-stacked data set) (A)						Shock exposure over RMS period (B)					
	All		**Burkina Faso**		**Niger**		**All**		**Burkina Faso**		**Niger**	
Africa Flood and Drought Monitor measures												
Climatic deficits												
Cumulative rainfall deficit	-1.79	**	0.73		-1.24	*	-3.86	*	0.95		-7.97	***
Cumulative streamflow deficit	-0.04	***	-0.03	**	-0.03	***	-0.085	***	-0.06	**	-0.10	**
Cumulative vegetation deficit	0.03	**	-0.01		-0.06	***	-0.06	***	-0.04	**	-0.13	***
Drought												
Meteorological drought	-3.81	***	a/		-2.82	***	-0.94	***	a/		-10.30	***
Streamflow drought	-1.62	**	-0.47		-1.84	***	-2.25		-1.34		-4.92	*
Severe streamflow drought							-4.67	***	-4.15	**	-4.92	*
Agricultural drought	1.77	***	0.47		-1.60		-3.03	***	-2.09	***	-4.83	***
Climatic surpluses (excesses)												
Cumulative rainfall surplus	0.25		-0.15		-0.05		1.58	**	1.07		1.66	**
Streamflow surplus	-0.002		-0.01		0.01		0.016		0.00		0.06	*
Flooding												
Meteorological flooding	1.86	***	1.04	*	-0.37		4.37	***	4.25	***	4.45	***
Streamflow flooding	-0.63	*	-0.32		-0.16		0.17		-0.24		4.48	
Severe streamflow flooding					-0.87	*	0.291		0.09		0.75	
Number of observations	3,758		1,893		1,865		828		425		403	
Household self-reported data												
Too little rain	-1.25	**	-0.20		-0.22		-0.20		-0.24		0.01	
Lack of rain at a critical time	-2.59	***	-2.22	***	-0.51		-0.92	*	-1.90	***	0.25	
Too much rain	0.06		-0.52		0.61		0.60		0.21		1.06	
Rain at wrong time	-0.07		-0.41		0.40		-0.17		0.11		-0.43	
Number of observations	3,048		1,564		1,484		828		425		403	

Notes: Asterisks represent statistical significance at 10 (*), 5(**) and 1(***) percent levels. *t*-statistics are robust to heteroskedasticity.
a/ No cases of meteorological drought.

Finally, Table 4.4 (below) looks at the effects of a variety of self-reported individual shocks included in the overall shock exposure index. The results suggest the following:

- The massive insect invasions that affected the Niger program area in round 2 had a negative impact on households' food security there;
- Conflict shock had a negative impact on food security, particularly in Burkina Faso;
- Economic shocks, including food price increases, had a strong negative effect on food security in both project areas. Collapse of economic activity, perhaps associated with rising civil insecurity, had negative effects in the Burkina Faso area;
- The elevated levels of serious illnesses of household members in Burkina Faso had a negative effect on households' food security there, as did emigration of family members;
- Sudden increases in household size, possibly associated with the welcoming of IDPs into host households (see Chapter 3), had a negative effect on households' food security in both project areas.

The positive association found between animal disease outbreaks and food security may be a reflection of the fact that households were eating animals no longer fit for sale on the market.

Table 4.4 Regression analysis of the effect of environmental, conflict, economic, and other types of shocks on household food security

	All		Burkina Faso		Niger	
Environmental shocks (non-climate)						
Massive insect/bird invasion	0.056		-0.244		-1.610	**
Animal disease outbreak	0.096	***	1.440	***	0.564	
Conflict shock						
Any conflict shock	-0.705	*	-1.990	***	-0.240	
Economic shock						
Any economic shock	-1.160	***	-0.925	***	-0.787	***
Sharp food price increases	-1.870	***	-0.798	***	-2.53	***
Increase in the price of productive inputs	-0.261		0.091		0.214	
Debt repayment	0.194		0.456		-0.437	
Collapse of economic activity	-1.390	***	-1.202	***	-1.127	
Other						
Serious illness of household member	-0.042		-1.370	***	2.590	***
Death of household member	0.455		0.650		0.692	
Emigration of family member	-0.548	*	-1.200	**	0.059	
Sudden increase in household size	-2.000	***	-1.400	**	-2.270	***
Number of observations	3,048		1,564		1,484	

Notes: Asterisks represent statistical significance at 10 (*), 5(**) and 1(***) percent levels. *t*-statistics are robust to heteroskedasticity.
a/ Reference category.

4.3 Household Resilience in the Face of Shocks

Resilience is the ability of a household to manage or recover from shocks and stresses. It is measured here using two types of indicators: (1) objective indicators based on changes in the food security index over the RMS period—realized resilience and food security stability; and (2) a subjective or "experiential" indicator based on households' own reports of their ability to recover from the shocks they experienced.

4.3.1 Objective Indicators of Resilience

The objective indicators (with associated percentages of households resilient) are defined as follows:

- **Long-term realized resilience:** The total change in food security over the RMS period.
    - Whether a household was able to maintain or increase its food security over the RMS period.
- **Short-term realized resilience:** The change in food security between RMS rounds (2-month periods).
    - Whether a household was able to maintain or increase its food security between RMS rounds.
- **Food security stability:** Whether a household was able to stay within one point of its round 1 food security (or above) throughout the RMS period.

The realized resilience indicators directly measure households' actual ability to recover from shocks, with ability indexed to a well-being outcome related to households' basic survival. Given that the food security index ranges from 0 to 27, these indicators range from -27 to +27. The stability indicator, a dummy variable equal to 0 or 1, measures households' ability to maintain steadiness in their well-being—despite negative stressors.

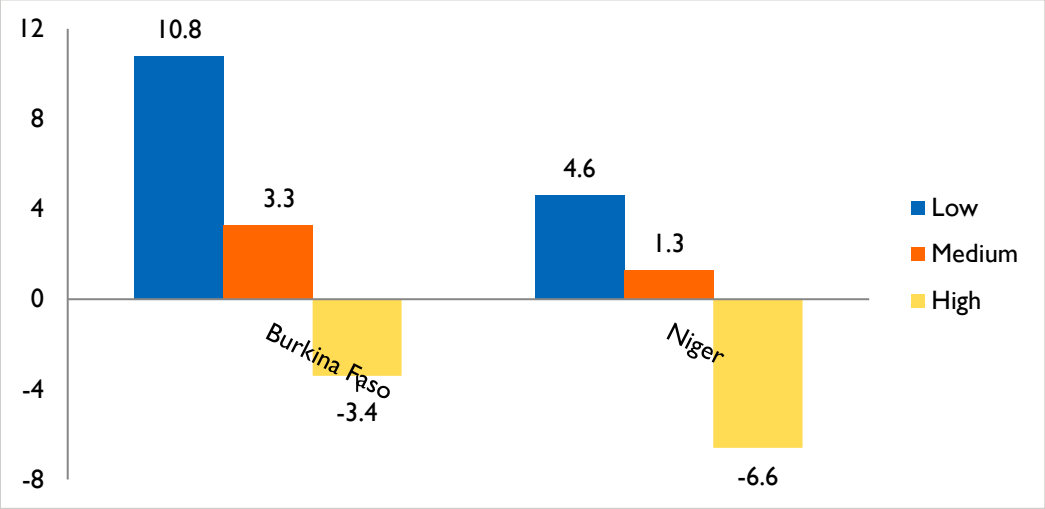
It is important to note that, as will be seen from the regression analyses of Chapters 7 and 8, the values of the realized resilience indicators are highly dependent on initial values of food security. The higher is the initial value of food security, the lower is realized resilience and vice-versa. This "regression to the mean" (Trochim 2020; Dalliard 2017) may be partly due to random measurement error, but has another source here: the bounds imposed on *changes* in food security by upper and lower bounds on the food security index. Much as human calorie consumption is bounded by human physiology, these bounds validly represent the finite phenomenon of food security. For our measures, they mean that the starting food security values circumscribe the possible range of realized resilience. For example, households starting out at a value of 0 can only take on realized resilience values of 0 to 27; their food security cannot go down. Households starting out at a value of 27, by contrast, can only take on realized resilience values of -27 to 0; their food security cannot go up. Similar considerations apply to the measure of food security stability.

The significance of regression to the mean in the objective measures of resilience is that the resilience of groups of households cannot be validly compared using them if their average starting

food security differs. In this case, simple comparison of means is not an accurate representation of differences in the true course of change due to factors like shocks, resilience capacities, and program interventions.

As we will see below, the mean long-term realized resilience for Burkina Faso is 0.97 while that for the Niger area is 1.89, suggesting that Niger area households are more resilient. Figure 4.2 illustrates how, when regression to the mean is accounted for by grouping households in both regions into similar initial food security groups, Burkina Faso area households are shown to be in fact more resilient than Niger households. For example, in the low initial food security group (with index range 0 to 11.5), the mean realized resilience of Burkina Faso households is 10.8 while it is 4.6 for Niger households.

Figure 4.2 Long-term realized resilience for groups of households with different initial levels of food security



Note: The initial food security ranges for the three groups are: 0-11.5 (low), 11.5-19.5 (medium) and 19.5+ (high).

For this analysis, valid comparisons across the two program areas are accomplished by statistically adjusting the realized resilience measures for initial food security using the following equation:[17]

$$Y_{i,1} - Y_{i,o} = \alpha + \beta_1 Y_{i,o} + \beta_2 \text{Niger},$$

where $Y_{i,1} - Y_{i,o}$ is the change in food security, $Y_{i,o}$ is initial food security, and "Niger" is equal to "1" if the household resides in the Niger area and "0" otherwise. The similar adjustment equation in the case of food security stability (S) is:

$$S_i = \alpha + \beta_1 Y_{i,o} + \beta_2 \text{Niger}.$$

[17] This equation is a variation on "Analysis of covariance" modelling, or the ANCOVA model (e.g., Barnett et al. 2004; Linden 2013).

4.3.2 Subjective Indicator of Resilience

The fourth indicator of resilience, the experiential ability to recover measure, is calculated using data on survey respondents' answers to the question, for each of the shocks experienced, "To what extent were you and your household able to recover?" The following are the possible responses:

1. Did not recover;
2. Recovered some, but worse off than before;
3. Recovered to same level as before;
4. Recovered and better off; and
5. Not affected.

The responses are used to calculate an ability to recover (ATR) index. To calculate the index, the five responses are coded from one to five (with "Did not recover" receiving the lowest score of one and "Not affected" receiving the highest score of five) for each shock experienced. Following, the average of the scores across shocks is taken to form the index. The index ranges from one to five.[18]

4.3.3 Descriptive Statistics for Resilience Indicators

Table 4.5 reports means and percentages of the four resilience indicators. Across the RISE program area, the percent of households resilient ranges from 55.0 (for food security stability) to 62.0 (based on long-term realized resilience). When initial food security is adjusted for, the realized resilience measures indicate that Burkina Faso households were more resilient to the shocks they faced than Niger households—despite their greater shock exposure as a group (see Chapter 3). This may be linked to the fact that Burkina Faso households had higher resilience capacities, the stronger positive influence of resilience capacities on resilience in the area (see Chapter 6), and/or greater local government responsiveness to community needs (see Chapter 5).

Food security stability over the RMS period was roughly the same for the program areas, with about 55 percent maintaining their food security within one point (or higher) of their food security at the start of the period. The perceived ability to recover index is also roughly equal across the program areas.

[18] The index of ability to recover can be statistically adjusted to take into account each households' degree of shock exposure. This procedure uses OLS regression to single out their general ability to recover regardless of current shock exposure (see Smith et al. 2015). For this analysis the adjustment was not performed because households' shock exposure was not statistically significant in the regression analysis.

Table 4.5 Household resilience in the face of shocks over the RMS period

	Unadjusted			Adjusted for initial food security		
	All	Burkina Faso	Niger	All	Burkina Faso	Niger
Initial food security				15.4	18.3	12.1
Long-term realized resilience						
Total change in food security	1.42	0.97	1.89	1.43	3.1	-0.3
Percent of households resilient	62.1	56.5	67.9	61.3	66.2	56.2
Short-term realized resilience (means across rounds)						
Total change in food security	0.26	0.04	0.49	0.29	0.94	-0.56
Percent of households resilient	58.0	56.4	60.1	57.2	58.3	56.3
Food security stability						
Percent hhs with stable food security	55.0	43.8	68.0	54.8	56	54.0
Perceived ability to recover (means across rounds)						
Ability to recover index	1.94	1.99	1.89	--	--	--

Note: Adjusted estimates of the indicators of realized resilience and food security stability correct for differences across the regions in the initial values of food security (see text for more detail).

4.4 Has Resilience Increased since the Baseline?

It is not possible to examine trends in resilience since the baseline using the objective measures because the time periods of measurement have not been equal in length. However, the ability to recover index (ATR), for which data were collected using a 12-month recall period three times over the project's implementation period—the baseline, midline and RMS round 1 surveys—can be compared over time to get a sense of how households' resilience has changed.

Table 4.6 indicates that resilience has increased in the Burkina Faso area—the ability to recover index increased by 13.2 percent between the baseline and RMS round 1. This increase occurred despite the large increase in shock exposure (see lower row of table). By contrast, the ability to recover has declined in the Niger area (by 9.5 percent) over this period of similarly increasing shock exposure.

Table 4.6 Baseline-midline RMS comparison of households' perceived ability to recover from shocks in the previous 12 months

	All				Burkina Faso				Niger			
Indicator	Base-line	Midline	RMS Round 1		Base-line	Midline	RMS Round 1		Base-line	Midline	RMS Round 1	
Ability to recover index	1.93	1.81	1.99	*	1.97	2.0	2.23	***	1.90	1.58	1.72	***
For reference: Shock exposure index	7.9	11.1	24.9		6.3	10.3	25.0		9.8	12.1	24.7	

Notes: Asterisks represent statistical significance of the baseline-Round 1 difference in ability to recover at 10 (*), 5(**) and 1(***) percent levels.

4.5 Summary

The chapter's analysis confirms that food insecurity is very high in both the Burkina Faso and Niger program areas. It is highest in the Niger area, where the percent of households severely food insecure rose to as high as 72.4 percent during RMS round 1 when shock exposure was at its peak.

Food security has remained relatively stable since the baseline in the Burkina Faso area. However, in the Niger area it had fallen by 30 percent by the end of the RMS period and showed a highly fluctuating pattern.

The shocks exposure experienced by households over the RMS period had a decidedly negative effect on their food security in both program areas. The data analysis of this chapter showed that the types of shocks that had negative effects were: drought, flooding, insect invasions (in the Niger area), conflict shocks, food price increases, illnesses of household members (in the Burkina Faso area), and sudden increases in household size. The latter is possibly associated with the welcoming of Internally Displaced Persons into host households.

With regard to resilience, 62 percent of households were able to recover from the shocks they faced over the RMS period, defined as maintaining or increasing their food security. Fifty-five percent maintained stability in their food security, another indicator of resilience. Burkina Faso households were better able to recover than Niger households, despite the fact that they experienced greater shock exposure. This finding may be due to Burkina Faso's higher resilience capacities, the stronger positive influence of resilience capacities on resilience in the area (see Chapter 6), and/or greater local government responsiveness to community needs (see Chapter 5). The program areas had roughly the same percentage of households who were able to maintain stability in their food security.

Has resilience increased since the baseline? Using an experiential indicator of households' ability to recover from shocks it was found that resilience has increased in the Burkina Faso area despite greatly increased shock exposure. By contrast, it has declined in the Niger area over this period of similarly rising shock exposure.

5. HUMANITARIAN ASSISTANCE AND GOVERNMENT RESPONSIVENESS

5.1 Humanitarian Assistance

Table 5.1 reports on the percent of households in the RISE area that received humanitarian assistance during the RMS period and the types of assistance received. In general, few households received assistance. For some areas this may be partly because of the inability of humanitarian actors to access them due to the threat of violent extremism. In the year prior to RMS round 1, about 15 percent of households received assistance. In the two months prior to all rounds between round 2 and round 5, 14 percent of households received assistance. Overall a slightly lower percent of Burkina Faso households received assistance than Niger households.

Of note is that the percent of households receiving assistance in the entire year prior to RMS round 1 is close to the percentages doing so in the two-month periods prior to RMS rounds 2 through 5. This pattern indicates that the RMS period was marked by an upturn in assistance.

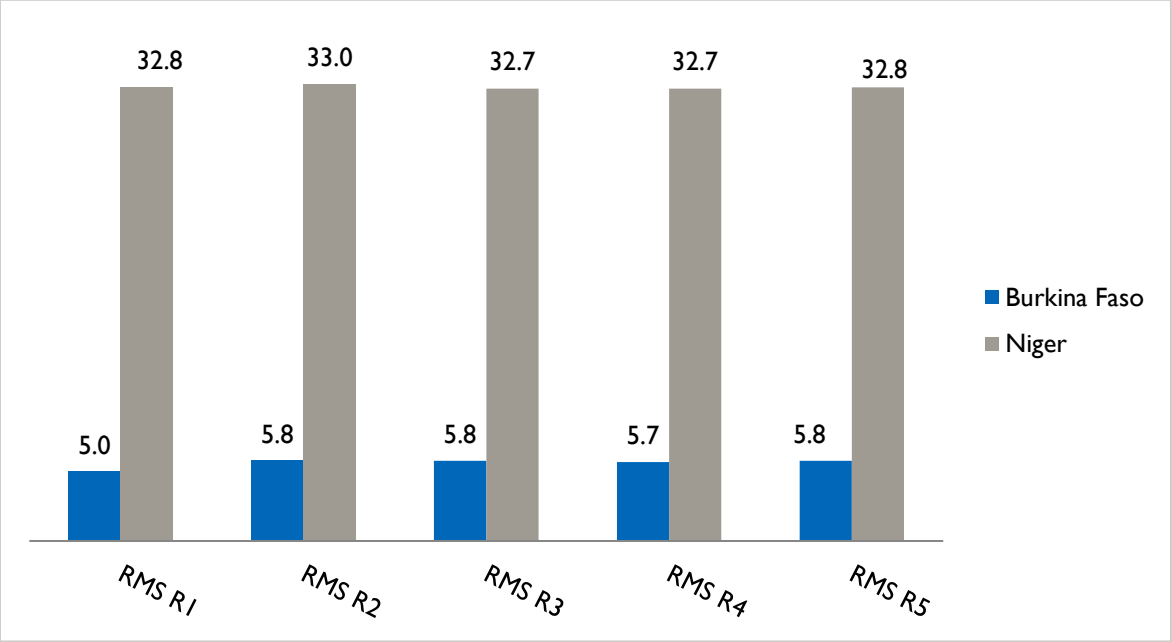
The most common form of assistance received was food aid, which was received by a substantially higher percent of households in the Burkina Faso area. For example, in the year prior to RMS round 1, 8.2 percent of Burkina Faso households received this assistance while only 4.8 percent of Niger households did. The other most commonly received types of assistance were social protection, drinking water, and cash assistance.

Notably, the percent of households reporting that they had taken a child to get help at a feeding center "because they did not have enough food to eat" was steadily very high in the Niger area, reaching 33 percent in RMS round 2 (see Figure 5.1). As seen in the last chapter, the percent of households classified as severely food insecure in Niger was far higher than in Burkina Faso in almost all RMS rounds (see Table 4.1). The greater use of feeding centers for children could be related to this greater prevalence of severe food insecurity compared to the Burkina Faso area and/or a greater availability of feeding centers.

Table 5.1 Comparison of percent of households receiving humanitarian and other assistance across the RMS rounds, by program area

Indicator	All					Program area									
						Burkina Faso					Niger				
	Round 1 (12m recall)	Round 2	Round 3	Round 4	Round 5	Round1 (12m recall)	Round 2	Round 3	Round 4	Round 5	Round1 (12m recall)	Round 2	Round 3	Round 4	Round 5
Received any humanitarian assistance	15.2	14.2	14.4	14.7	14.5	15.0	13.5	13.5	13.8	13.4	15.5	15.0	15.4	15.5	15.5
Received….															
Food assistance	6.8	6.3	6.2	6.4	6.1	8.2	7.8	7.7	8.0	7.5	4.8	4.5	4.6	4.8	4.8
Subsidy/social protection	4.8	4.2	4.2	4.2	4.2	4.7	3.5	3.4	3.5	3.6	4.9	5.0	4.9	4.8	4.8
Drinking water	3.0	3.3	3.2	3.3	3.1	2.4	2.6	2.5	2.5	2.0	4.0	4.2	4.0	4.1	4.1
Cash/voucher assistance	1.5	1.3	1.3	1.3	1.3	2.2	1.9	1.9	2.0	2.0	0.6	0.5	0.6	0.7	0.6
Drinking water for animals	1.1	1.2	1.2	1.2	1.2	0.8	1.0	1.0	1.0	0.8	1.4	1.5	1.4	1.4	1.5
Feed/fodder	0.9	1.0	0.9	0.9	0.8	1.4	1.6	1.5	1.5	1.3	0.3	0.3	0.3	0.3	0.3
Food for work/cash for work	0.4	0.3	0.5	0.5	0.5	0.0	0.1	0.1	0.1	0.1	1.0	0.7	1.0	1.0	1.0
Taken a child to get help at a feeding center because they did not have enough food to eat	16.4	18.4	19.1	19.3	19.7	5.0	5.8	5.8	5.7	5.8	32.8	33.0	32.7	32.7	32.8

Figure 5.1 Percent of households with a child taken to get help at a feeding center, by RMS round and program area



5.2 Government Responsiveness

In the next chapter of this report it is found that households' access to services and infrastructure helped them to recover from the shocks they faced over the RMS period. The main means through which they gain access to services and infrastructure is through requests of their local government by their communities. In turn, that access is dependent on whether local governments respond positively to the requests and actually provide the services and infrastructure requested.

Table 5.2 contains data on the percent of households indicating that their local government was approached about a service or infrastructure need, in addition to requests for food assistance. RISE program area-wide, some of the most common requests were for schools, drinking water services, health facilities, roads, and food assistance. Among these requests, the percent in turn indicating that it was addressed (or promised to be addressed) was quite high, ranging from 72.2 % for drinking water services to 83.4% for food assistance. Note also that almost all (97.3%) of the few requests for assistance with conflict resolution were responded to.

Households in the Burkina Faso area reported substantially more requests for services and infrastructure than households in the Niger area. Further, government responsiveness was generally higher there. The one exception if that a somewhat higher percentage of Niger households reported that their requests for health facilities were responded to in a positive manner.

Table 5.2 Government responsiveness to community requests for services, infrastructure, and food assistance, by program area

Service	All		Program area			
			Burkina Faso		Niger	
	Local government approached about need?	Need addressed or promised to be addressed?	Local government approached about need?	Need addressed or promised to be addressed?	Local government approached about need?	Need addressed or promised to be addressed?
	(Percent of households)					
Schools	45.8	78.2	58.2	80.0	27.3	71.3
Piped water/boreholes/wells	40.5	72.2	49.1	72.6	27.9	71.4
Health center/post/clinic	40.0	81.7	47.7	80.8	28.7	84.4
Roads	36.5	76.5	47.6	80.3	19.9	60.4
Food assistance (in-kind or as cash)	35.6	83.4	38.4	92.1	31.5	67.4
Irrigation systems	8.4	63.6	9.6	84.0	6.4	--
Natural resource conservations	7.7	82.3	5.7	86.5	10.7	79.2
Confict resolution	6.7	97.3	4.4	--	10.1	95.6
Fodder	6.2	64.6	7.8	66.1	3.9	--
Security	5.1	88.3	2.9	--	8.3	90.7
Habitat	4.0	73.3	2.3	--	6.5	67.6
Public transporation	1.5	--	0.3	--	3.3	--
Other	3.6	76.8	2.7	--	5.0	--

Note: The statistics in this table refer to the period spanning August 2017 (one year prior to RMS Round 1) through April 2019 (RMS Round 5). Approximately 20 percent of survey respondents indicated "Don't know" to enumerators for each service category. Table values refer only to the remaining households. Blank entries signifiy insufficient observations for accurate estimation (N<30).

5.3 Summary

Few households received humanitarian assistance over the RMS period, about 15 percent in any two-month period. The most common forms of assistance were food aid, social protection, drinking water, and cash assistance. The percent of households reporting that they had taken a child to get help at a feeding center "because they did not have enough food to eat" was notably high throughout the RMS period in the Niger area, reaching 33 percent in RMS round 2.

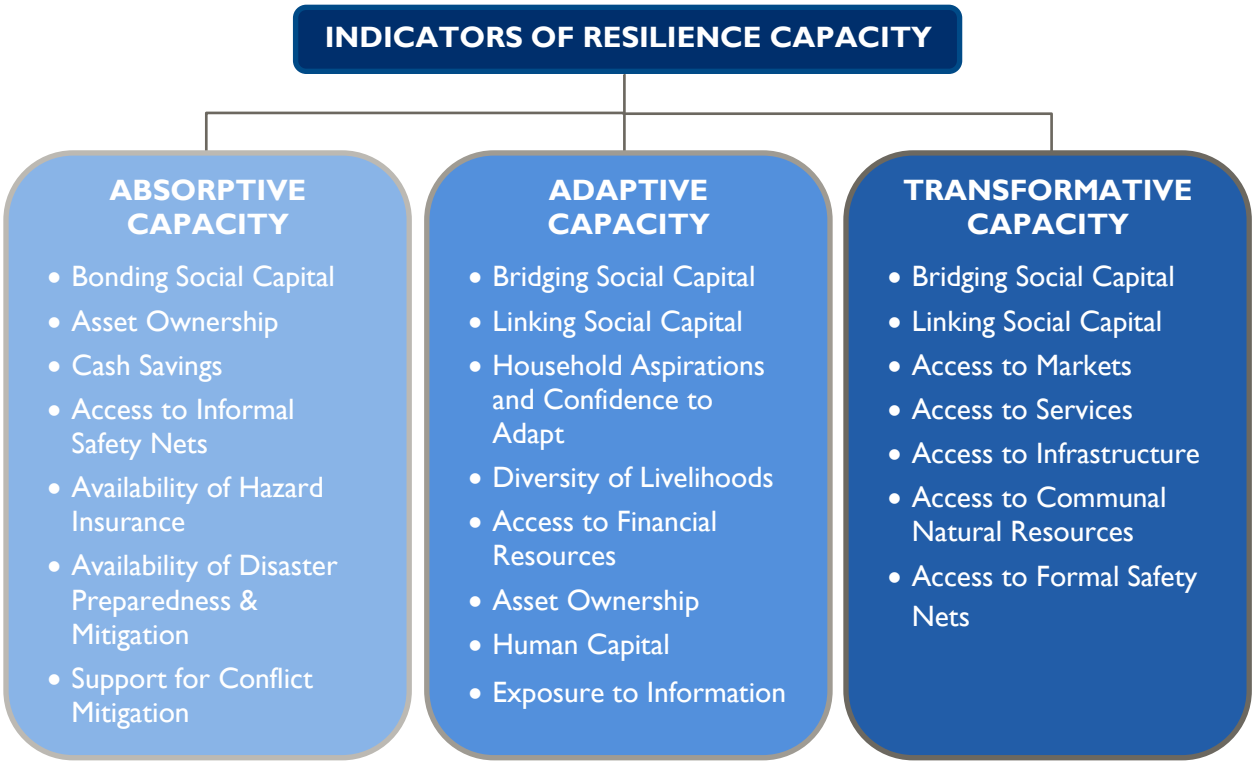
This chapter also looked at local government responsiveness to community requests for services, infrastructure, and food assistance. Some of the most common requests were for schools, drinking water services, health facilities, roads and food assistance. Households in the Burkina Faso area made more requests of their local governments than did those in the Niger area, and government responsiveness was higher there.

6. SHOCK RECOVERY: THE ROLE OF HOUSEHOLDS' RESILIENCE CAPACITIES

While resilience itself is an ability to manage or recover from shocks, resilience capacities are a set of conditions, attributes, or skills that enable households to achieve resilience. This chapter examines the role of households' resilience capacities, as measured during the midline survey, in strengthening their resilience to shocks. It first looks at which of the three dimensions of resilience capacity—absorptive, adaptive and transformative—made a difference in households' recovery. It then asks which specific capacities helped them recover. These capacities are the actionable programming and policy levers that can potentially strengthen households' resilience.

Given their complexity, measuring the three dimensions of resilience capacity requires combining multiple indicators of the underlying concepts into an overall indicator. Figure 6.1 lists the indicators used to measure them for this analysis. The indicators are combined into indexes of the three capacities and an overall index of resilience capacity using factor analysis. The capacities were measured at baseline and then again as part of the midline survey. The baseline and midline reports (Smith et al. 2015; Smith et al. 2018) describe the indicators and their measurement in detail. The values used here are those from the midline (April/May 2017), that is, 16 months before the start of RMS 2018-19.

Figure 6.1 Indicators employed to measure resilience capacity



The values of all indicators of resilience capacity at baseline and midline are given in Table 6.1. For both time periods, the Niger program area households had lower resilience capacity than did Burkina Faso area households.

Table 6.1 Resilience capacity indicators and indexes: baseline and midline values by program area

Indicator	All		Program area			
			Burkina Faso		Niger	
	Baseline	Midline	Baseline	Midline	Baseline	Midline
Social capital						
Bonding social capital	71.3	75.1	75.7	71.0	65.9 [a]	80.3 [a]
Bridging social capital	52.6	56.2	51.7	46.1	53.7 [a]	68.7 [a]
Linking social capital	47.1	44.5	54.1 [a]	48.6 [a]	38.6	39.7
Aspirations and confidence to adapt	39.1 [a]	42.0 [a]	43.4	44.6	33.6	38.9
Livelihood diversity	2.58	2.54	2.71 [a]	2.46 [a]	2.41 [a]	2.64 [a]
Asset ownership						
Consumer durables	7.78 [a]	8.18 [a]	9.27	9.15	5.95 [a]	6.98 [a]
Farming implements	4.35	4.14	4.77 [a]	4.18 [a]	3.85	4.09
Animals owned (Tropical Livestock Units)	3.71	3.61	5.54	5.24	1.47	1.60
Land owned (ha)	3.69	3.41	3.66 [a]	3.13 [a]	3.73	3.76
Index of asset ownership	23.6	23.4	27.2 [a]	25.1 [a]	19.1 [a]	21.2 [a]
Access to financial resources						
Access to credit (% of hholds)	68.7	61.0	74.3	67.6	61.7	52.8
Access to savings (%)	50.5	51.8	49.1	59.0	52.2	42.9
Index of access to financial resources	1.19	1.13	1.23	1.27	1.14	0.96
Currently holding savings	37.1	31.9	55.1 [a]	40.6 [a]	15.0	21.2
Access to markets, infrastructure, services, and communal natural resources						
Access to markets	1.58	1.82	1.80	1.69	1.31 [a]	1.97 [a]
Access to infrastructure	1.26	1.19	1.23	1.35	1.30	0.99
Access to basic services	4.03	4.23	4.22	4.41	3.81	4.01
Access to communal natural resources	1.94	1.75	1.81	1.65	2.10	1.88
Human capital and access to information						
Human capital	27.2	26.2	25.9	26.7	28.9	25.7
Exposure to information	3.46 [a]	2.56 [a]	3.43 [a]	2.58 [a]	3.51 [a]	2.54 [a]
Safety nets						
Formal safety nets	0.97	0.92	0.78	0.98	1.21	0.86
Informal safety nets	2.01	2.14	2.16	2.59	1.83	1.59
Disaster preparedness and mitigation	0.68	0.49	0.41	0.51	1.02	0.48
Hazard insurance (% of hholds)	46.2 [a]	26.5 [a]	40.6 [a]	18.8 [a]	53.2	35.9
Institution providing conflict mitigation (%)	55.4	46.8	62.5	58.6	46.6	32.3
Indexes of resilience capacity						
Absorptive capacity	46.2	43.0	48.7	46.3	43.0	38.9
Adaptive capacity	50.9	48.4	56.4 [a]	51.0 [a]	44.0	45.0
Transformative capacity	47.1	47.3	50.8	50.3	42.6	43.7
Overall resilience capacity	52.2	50.0	57.0 [a]	53.1 [a]	46.2	46.2

a/ Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

Note: The indexes of resilience capacity range from 0 to 100 and are calculated using factor analysis. Unless otherwise noted, the individual indicators are measured either as additive indexes or factor analysis indexes (see Smith et al. 2015; Smith et al. 2018).

6.1 Did Households' Resilience Capacities Help Them Recover from Shocks?

6.1.1 Overall Resilience Capacity

Table 6.2 contains regression results analyzing the associations between the four measures of resilience introduced in Chapter 4 and the overall resilience capacity index. The independent variables controlled for are shock exposure (the index of self-reported exposure), initial food security where appropriate, household socio-demographic characteristics, livelihood group, wealth (asset ownership), and program area. The resilience capacity coefficients for the program areas are given at the bottom of the table.

Note that for the long-term realized resilience and food security stability analyses, the observations are for each household's measure of resilience over the entire RMS period. The sample size is less than the full 828 RMS households because not all participated in both the round 1 and round 6 surveys (it is 615, 75.5 percent of the full sample). Similarly, not all households participated in all five rounds, and thus the sample size for the food security stability measure is 555 (67 percent of the full sample).

The results indicate that households' initial resilience capacities before the onset of the shock period did indeed strengthen their resilience. In particular, it boosted their ability to recover from and maintain stability of their food security in the face of the shocks that occurred over the entire nine-month period. As would be expected from these results for the long-term realized resilience measure, it also boosted their ability to recover from immediate shocks (see short-term realized resilience results). The regression coefficients for the three objective measures of resilience are strongly statistically significant ($p<0.01$). The coefficient for perceived ability to recover is positive but not statistically significant ($p=0.296$).

The results for the RISE area as a whole apply to the Burkina Faso program area. However, for the Niger area the resilience capacity index coefficient is only positive and statistically significant for the measure of short-term realized resilience.

Table 6.2 Regression analysis of the relationship between overall resilience capacity and resilience

Measure of resilience	Realized resilience				Food security stability		Perceived ability to recover	
	Total change in food security over RMS period (9 months)		Change in food security between rounds (2-month periods)					
Resilience capacity	**0.055**	***	**0.029**	***	**0.019**	***	**0.002**	
Shock exposure index	-0.069		-0.065	***	-0.020	*	-0.001	
Initial food security	-0.720	***	-0.617	***	-0.140	***		
Adult equivalents	0.192		0.130		0.053		0.014	
AE-squared	-0.011		-0.009		-0.004		-0.001	
Percent females 0-16 a/								
Females 16-30	0.030		0.012		0.004		-0.001	
Females 30 plus	0.005		0.008		-0.001		0.001	
Males 0-16	-0.002		-0.002		0.003		0.001	
Males 16-30	0.001		0.001		0.011		0.002	
Males 30 plus	0.018		0.008		-0.006		0.003	
Education: None a/								
Primary	0.488		0.080		0.256	*	0.047	
Secondary	1.189		0.638	**	0.175		0.042	
Female-adult-only hh	1.222		0.731		-0.018		0.134	
Livelihood: Other a/								
Agriculture	-0.095		0.115		0.099		0.048	
Pastoralism	-0.668		0.368		0.043		0.036	
Asset index	-0.031		0.023		-0.012		0.003	
Niger	-3.521	***	-1.248	***	-0.082		-0.068	
Time period								
Round 2 a/								
Round 3			-2.035	***			-0.023	
Round 4			-4.569	***			-0.094	*
Round 5			-5.488	***			-0.237	***
R-squared	0.418		0.446				0.030	
Prob>F					0.0003			
Number of observations	619		2,833		555		2,835	
Resilience capacity index coefficients by program area								
Burkina Faso	0.081	***	0.028	**	0.027	**	0.002	
Niger	0.030		0.021	**	0.012		0.003	

Notes: Asterisks represent statistical significance at 10 (*), 5(**) and 1(***) percent levels.
t-statistics are robust to heteroskedasticity.
a/ Reference category

6.1.2 The Three Dimensions of Resilience Capacity

Which of the three dimensions of resilience capacity helped strengthen households' resilience? The results in Table 6.3 indicate that all three—absorptive, adaptive and transformative capacity—played a role. Again, we find that the results for the full sample apply generally to the Burkina Faso program area. Although weak, some evidence is provided that Niger households' adaptive capacities helped boost their resilience in the short run and to maintain stability in their food security. The perceived ability to recover index shows no statistically significant associations between households' ability to recover and their resilience capacities.

Table 6.3 Regression analysis of the relationship between the three dimensions of resilience capacity and resilience

Measure of resilience	Realized resilience				Food security stability		Perceived ability to recover	
	Total change in food security over RMS period (9 months)		Change in food security between rounds (2-month periods)					
All								
Absorptive capacity	0.016		0.018	**	0.006		0.001	
Adaptive capacity	0.050	**	0.030	***	0.022	***	0.002	
Transformative capacity	0.041	***	0.015	**	0.009	**	0.003	
	N=619		N=2,833		N=555		N=2,835	
Burkina Faso								
Absorptive capacity	0.039	**	0.029	**	0.02	***	-0.002	
Adaptive capacity	0.069	**	0.027	*	0.029	**	0.002	
Transformative capacity	0.048	***	0.011		0.008		0.002	
	N=281		N=1,441		N=264		N=1,511	
Niger								
Absorptive capacity	0.011		0.011		0.0007		0.001	
Adaptive capacity	0.027		0.023	*	0.016	*	0.003	
Transformative capacity	0.026		0.009		0.007		0.003	
	N=338		N=1,392		N=291		N=1,324	

Notes: Asterisks represent statistical significance at 10 (*), 5(**) and 1(***) percent levels.
t-statistics are robust to heteroskedasticity.

6.1.3 Did Resilience Capacity Reduce the Negative Impact of Shocks on Food Security?

Table 6.4 contains regression results investigating whether households' resilience capacities reduced the negative impact of the shocks they faced over the RMS period. If so, then the evidence that they enhance households' resilience to shocks is reinforced.

The independent variables are the overall index of resilience capacity, shock exposure, and the variables controlling for demographic and economic characteristics of households, including their asset ownership. The results are shown for three shock exposure measures, the

perceptions-based food security index, the cumulative vegetation deficit, and whether or not a household experienced agricultural drought.[19] The main result of interest is the sign and statistical significance of the coefficient on an interaction term between shock exposure and the resilience capacity index; a positive coefficient is suggestive evidence of the resilience-enhancing effect of resilience capacity.[20]

Table 6.4 Does resilience capacity reduce the negative impact of shocks on food security?

	Shock exposure index (perceptions-based)		Cumulative vegetation deficit (G)		Agricultural drought (H)	
All						
Resilience capacity	0.490	***	0.022	*	0.022	
Shock exposure	-0.007		-0.147	***	-5.48	***
RC*Shock exposure	-0.001	**	0.002	***	0.073	***
Burkina Faso						
Resilience capacity	0.043	***	0.016		0.015	
Shock exposure	0.002		-0.124		-5.08	***
RC*Shock exposure	-0.0012	**	0.002	***	0.071	***
Niger						
Resilience capacity	0.029		0.053	**	0.051	**
Shock exposure	-0.076		-0.087		-5.26	***
RC*Shock exposure	-0.0001		-0.001		0.056	

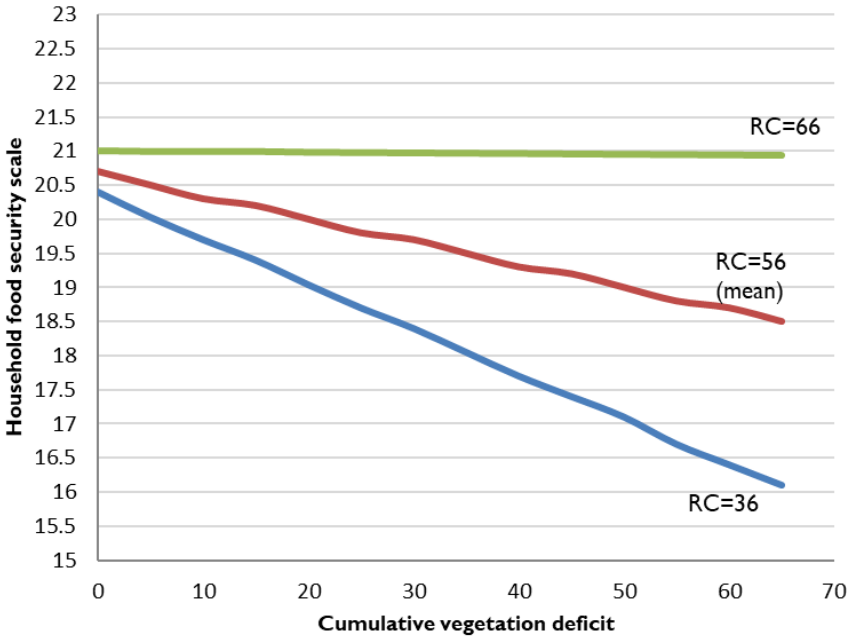
Notes: Asterisks represent statistical significance at the 10 (*), 5(**) and 1(***) percent levels.
t -statistics are robust to heteroskedasticity.

When the perceptions-based shock exposure index is employed, the coefficient on the interaction term is *negative*, indicating that resilience capacity increases the negative impact of shock exposure. A closer look at this result, which applies only to the Burkina Faso area, reveals that two types of adaptive capacity are driving it: bridging social capital and asset ownership. Bridging social capital refers to the bonds connecting people belonging to different communities with one another that enable households to meet their needs in hard times. The implied increase in the negative impacts of shocks on food security for households with greater bridging social capital may be related to the rising civil insecurity in the Burkina Faso program area throughout the RMS period. The civil insecurity may have disrupted that social capital as people no longer felt safe traveling outside of their villages. With respect to asset ownership, a major component of such ownership in the Burkina Faso area is livestock (see Table 6.1). Households with more animals may have experienced more negative impacts of the climate shocks than others.

[19] The coefficient on the interaction term is not statistically significant for the other AFDM measures (the rainfall and streamflow measures).
[20] Equation (5) in Chapter 2 is the empirical specification for this analysis.

The results for the vegetation deficit and agricultural drought indicate that in the Burkina Faso area the higher is households' resilience capacity, the less negative is the relationship between shock exposure and food security. They suggest that resilience capacity does reduce the negative impact of this specific shock that is directly related to the state of a key source of households' livelihoods in the program area: their land. The relationship between vegetation deficits and food security implied by the regression results is illustrated in Figure 6.2. It shows the linear relationship between food security and the cumulative vegetation deficit at three levels of resilience capacity (using the overall index of resilience capacity): the mean (56), the mean plus 20 points and the mean minus 20 points. Increasing vegetation deficits have no impact on households with the higher level of resilience capacity. Those with the lowest levels see steady declines in their food security.

Figure 6.2 Estimated recovery trajectory with increasing vegetation deficit at differing levels of resilience capacity (Burkina Faso program area)



6.2 Which Specific Resilience Capacities Helped Households Recover?

6.2.1 Recovery from Shocks of the RMS Period

We next turn to determining which specific capacities boosted households' resilience to the shocks they faced over the RMS period. The results are presented in Table 6.5. The analysis is conducted for the three objective measures of resilience and three shock exposure measures: the overall perceptions-based shock exposure index (Panel A), meteorological drought (Panel B), and agricultural drought (Panel C). In the table the blue-shaded cells indicate a positive, statistically significant association between a resilience capacity and resilience, that is, that there is a positive relationship between the capacity and resilience.

Table 6.5 Regression analysis of the relationship between households' resilience to shocks and specific resilience capacities

Shock exposure measure:	Overall shock exposure (perceptions-based) (A)			Meteorological drought (based on satellite data) (B)			Agricultural drought (based on satellite data) '(C)		
	Total change in food security over RMS period	Change in food security between rounds	Food security stability	Total change in food security over RMS period	Change in food security between rounds	Food security stability	Total change in food security over RMS period	Change in food security between rounds	Food security stability
Absorptive capacity									
Bonding social capital		***			**			**	
Holdings of savings		**							
Access to informal safety nets	**	***	***		**	***		*	***
Availability of hazard insurance									
Disaster prep/mitigation									
Asset index		***			***			***	
Adaptive capacity									
Bridging social capital		*	**		*	***			***
Linking social capital	**			**		*	**		*
Aspirations/confidence to adapt									
Livelihood diversity									
Access to financial resources		*			*			*	
Human capital			*			**			**
Exposure to information		*	**			***			**
Asset index (as above)		***			***			***	
Transformative capacity									
Bridging social capital (as above)		*	**		*	***			***
Linking social capital (as above)	**			**		*	**		*
Access to markets		*			**			**	
Access to infrastructure	***			***	**	**	***	***	**
Access to services	**	**	**	**	***	***	**	***	***
Communal nat. resources									
Formal safety nets									

Notes: Blue-shaded cell indicate a positive coefficient; asterisks represent statistical significance at the 10 (*), 5(**) and 1(***) percent levels.

The capacities that likely enabled households to recover are, for the three resilience measures in turn:[21]

Long-Term Resilience
(9-month RMS period)

- Access to Informal Safety Nets
- Linking Social Capital
- Access to Infrastructure
- Access to Services

Short-Term Resilience
(2-month periods between rounds)

- Bonding Social Capital
- Bridging Social Capital
- Holdings of Savings
- Access to Informal Safety Nets
- Asset Ownership
- Access to Financial Resources
- Exposure to Information
- Access to Markets
- Access to Infrastructure
- Access to Services

Food Security Stability
(9-month RMS period)

- Access to Informal Safety Nets
- Bridging Social Capital
- Linking Social Capital
- Human Capital
- Exposure to Information
- Access to Infrastructure
- Access to Services

The differing enabling capacities identified for the three measures is due to their differing meanings and time frames. But, ultimately, all are linked to households' ability to recover over the longer term, in this case over the nine-month RMS period. The capacities that show up for all three measures of resilience, and thus for which the evidence is strongest, are: access to informal safety nets, access to infrastructure, and access to services. Social capital likely played a key role: at least one of the three types, bonding, bridging or linking, is identified to have enabled households' recovery for all three of the resilience measures.

6.2.2 Comparison with Findings from the Baseline and Midline Analyses

Table 6.6 highlights the capacities that showed a positive and statistically significant association with households' resilience to shocks across the baseline, midline and RMS 2018-19 surveys. Three capacities stand out as having likely assisted households recover from the shocks they faced in all three surveys:

[21] Variables listed are those for whom the relationship with the resilience indicator is (1) positive and statistically significant at least at the 5 percent level for at least one shock measure; or (2) significant at least at the 10 percent level for multiple shock exposure measures.

- Bonding social capital;
- Bridging social capital; and
- Access to financial resources.

Others that showed up in at least two of the surveys are holdings of savings, asset ownership, linking social capital, human capital, and access to infrastructure.

Table 6.6 Comparison of resilience capacities that helped households recover from shocks across the baseline, midline and RMS 2018-19

	Baseline	Midline	RMS 2018-19
Absorptive capacity			
Bonding social capital	■	■	■
Holdings of savings			■
Access to informal safety nets			■
Availability of hazard insurance		■	
Disaster prep/mitigation	■	■	
Asset ownership		■	■
Adaptive capacity			
Bridging social capital	■	■	■
Linking social capital	■		■
Aspirations/confidence to adapt	■		
Livelihood diversity			
Access to financial resources	■	■	■
Human capital	■		■
Exposure to information			■
Asset ownership		■	■
Transformative capacity			
Bridging social capital (as above)	■	■	■
Linking social capital (as above)	■		■
Access to markets			■
Access to infrastructure			■
Access to services			■
Communal nat. resources			
Formal safety nets	■		

Note: The baseline analysis was based on cross-sectional data while the midline and RMS analyses are based on panel data. Blue-shading indicates a positive coefficient in regression analysis.

6.3 Summary

While resilience itself is an ability to manage or recover from shocks, resilience capacities are a set of conditions, attributes, or skills that enable households to achieve resilience. This chapter examined the role of households' resilience capacities, as measured during the midline survey, in strengthening their resilience to the shocks they faced over the RMS period. It first looked at which of the three dimensions of resilience capacity—absorptive, adaptive and transformative—made a difference in households' recovery. It then asked which specific capacities enhanced their resilience.

The results indicate that households' initial resilience capacities before the onset of the shock period did indeed strengthen their resilience, boosting their ability to recover and to maintain stability of their food security in the face of the shocks. Evidence is provided that they reduced the negative impact of shocks on households' food security, a further indication that they strengthened their resilience. Households' own initial resilience capacities played a stronger role in boosting resilience in the Burkina Faso area than the Niger area. All three dimensions of resilience capacity boosted resilience in the Burkina Faso area. Only households' adaptive capacities may have done so in the Niger area.

A wide range of specific resilience capacities helped strengthen households' resilience to the shocks they faced over the RMS period, including:

- Social capital (bonding, bridging and linking)
- Access to informal safety nets
- Holdings of savings
- Asset ownership
- Access to financial resources
- Human capital
- Exposure to information
- Access to markets
- Access to infrastructure
- Access to services

Three capacities stand out as having likely assisted households recover from the shocks they faced prior to all three RISE IE surveys, the baseline, midline, and RMS 2018-19:

- Bonding social capital
- Bridging social capital
- Access to financial resources.

Others that showed up in at least two of the surveys are holdings of savings, asset ownership, linking social capital, human capital, and access to infrastructure. These and the others listed above are the actionable programming and policy levers that can potentially strengthen households' resilience in the future.

7. THE IMPACT OF RISE ON HOUSEHOLDS' ABILITY TO RECOVER: EXPLORATORY ANALYSIS

Appropriate data for a formal impact evaluation of the RISE program will be collected as part of the endline survey. Meanwhile, in this chapter an exploratory analysis of the effect of the program to date on households' resilience to shocks is undertaken. The analysis draws on the differences across households residing in high exposure villages (the "treatment group") and low exposure villages (the "control group"). As detailed in Chapter 2, high exposure villages are benefiting from a set of FFP projects, REGIS-ER and/or REGIS-AG—the latter two of which provide comprehensive resilience programming—while low exposure villages are not.

The methods employed are laid out in Chapter 2. They are: (1) regression analysis examining the relationship between RISE intervention exposure and the four measures of resilience (long-term realized resilience, short-term realized resilience, food security stability, and perceived ability to recover); and (2) difference-in-difference analysis.

Table 7.1 compares the four measures of resilience across the RISE low- and high-exposure households. With regard to realized resilience, both the long-term and short-term measures are greater for the high-exposure households as a group, with the differences being statistically significant at the 5 and 10 percent levels, respectively. Higher levels of realized resilience are apparent for both Burkina Faso and Niger households, although they are only statistically significant in the case of long-term resilience for Niger households.

Figure 7.1 illustrates the difference across the low and high-exposure groups for long-term realized resilience, showing the change in food security over the RMS period for the two groups.

While the percent of households with food security stability is almost 10 points higher for the high-exposure households (Table 7.1), the difference is only statistically significant for Niger households. Finally, the perceived ATR is also greater among high-exposure households, but in this case only for Burkina Faso households.

These descriptive findings indicate that the RISE program has had its intended positive impact. However, pre-existing differences between the low-exposure and high-exposure groups could be driving the differences between them seen in Table 7.1. The next section looks at these pre-existing differences before embarking on the regression analyses of the rest of the chapter.

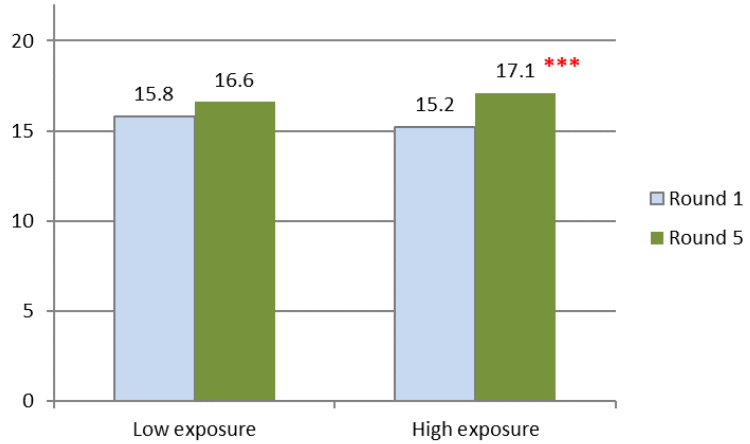
Table 7.1 Comparison of resilience measures across low-exposure and high-exposure households, by program area

Measure	Low exposure	High exposure	Difference	t-stat	p value	
All						
Realized resilence: Long-term	0.71	2.09	1.38	1.83	0.078	*
Realized resilience: Short-term	-0.02	0.56	0.57	2.20	0.028	**
Food security stability	50.10	59.10	9.00	1.50	0.144	
Perceived ability to recover	1.91	1.98	0.07	2.61	0.009	***
Burkina Faso						
Realized resilence: Long-term	0.500	1.480	0.980	0.760	0.457	
Realized resilience: Short-term	-0.106	0.275	0.381	1.450	0.148	
Food security stability	43.1	44.5	1.4	0.140	0.885	
Perceived ability to recover	1.990	2.080	0.090	2.890	0.004	***
Niger						
Realized resilence: Long-term	0.959	2.632	1.673	2.490	0.024	**
Realized resilience: Short-term	0.097	0.794	0.697	1.490	0.137	
Food security stability	60.7	72.7	12.0	2.250	0.040	**
Perceived ability to recover	1.810	1.880	0.070	1.540	0.123	

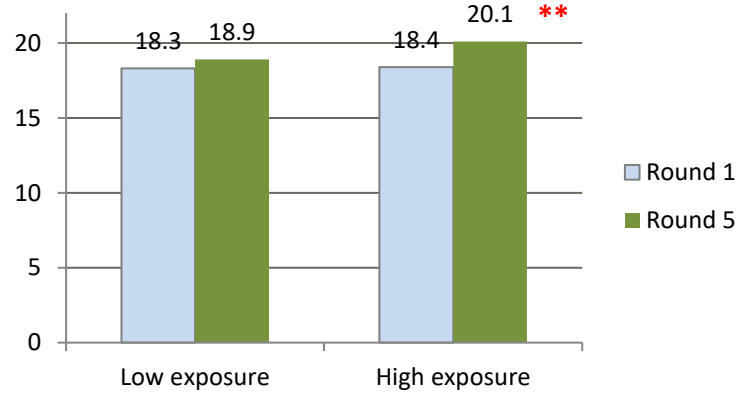
Notes: Asterisks represent statistical significance at 10 (*), 5(**) and 1(***) % levels.

Figure 7.1 Long-term realized resilience: Change in food security over the RMS period for RISE low- and high-exposure households, by program area

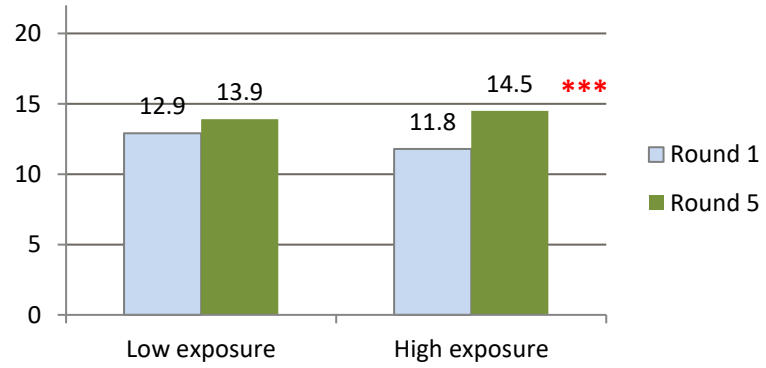
All



Burkina Faso



Niger



Note: Asterisks represent statistical significance at 10(*), 5(**) and 1(***) percent levels.

7.1 Comparison of Pre-Existing Characteristics of Low-Exposure and High-Exposure Households

Table 7.2 compares the food security, resilience, shock exposure, and resilience capacities of low- and high-exposure households at the times of the baseline, midline, and RMS round1 surveys. It shows that at baseline food security was greater among the high-exposure households. Additionally, households' resilience capacities were substantially greater for high-exposure households, with the overall index of resilience capacity being a full 33 percent higher. Other differences across the groups were that the low-exposure group owned more animals and land, and the high exposure group was more educated and less likely to rely on pastoralism as a primary livelihood.

As noted in the midline report (Smith at el. 2018), two factors may underlie the above differences across our treatment and control groups. First, most of the high-exposure villages had already benefited from some REGIS-ER interventions at the time of the baseline. Second, the selection of which specific villages to introduce interventions in by some RISE partners was founded on explicit or implicit criteria and based on the judgment of local technical and administrative authorities. Examples of these criteria are accessibility, absence of serious conflicts, and demonstration of local initiative or leadership. These considerations governing intervention allocation may account for some of the noted differences in the baseline "starting points" of high and low-exposure villages.[22]

The differences seem to have largely disappeared by the time of the midline, however. The data in Table 7.2 (right-hand panel) show no difference in the food security, (perceived) ability to recover, or shock exposure of the low- and high-exposure households at midline. The slightly greater resilience capacity of high-exposure households is not significantly different from that of low-exposure households. The only difference detected between the two groups is that high exposure households own less land.

Despite little disparity between the control and treatment groups for this analysis at the time of the midline, differences could have emerged between the midline and the start of the RMS.[23] Further, mean differences could be masking those at the extremes of some of the characteristics listed above. In the regression analyses of the rest of this chapter, the characteristics are thus taken into account in order to explore whether the RISE program itself strengthened households' resilience to the shocks they faced over the RMS period.

[22] Steve Reid (Chief of Party, SAREL). Personal communication, March 2018.
[23] Most of the characteristics listed in Table 7.2 were not re-measured during the RMS data collection.

Table 7.2 Comparison of initial characteristics of low exposure and high exposure households

Measure	Baseline				Midline				RMS Round 1			
	Low exposure	High exposure	Difference		Low exposure	High exposure	Difference		Low exposure	High exposure	Difference	
Food security												
Food security index	19.33	21.14	1.81	**	15.80	15.20	-0.60		15.8	15.2	-0.60	
Dietary diversity score	5.10	5.09	-0.01		4.20	4.10	-0.10		4.20	4.09	-0.11	
Resilience												
Ability to recover index	1.89	1.99	0.10		1.99	1.99	0.00		1.98	2.13	0.15	*
Shock exposure												
Perceptions-based shock exposure index (Previous year)	8.13	7.59	-0.54		25.10	24.70	-0.40		25.1	24.7	-0.40	
Cumulative rainfall deficit a/	2.14	2.07	-0.07		3.12	2.87	-0.25		3.12	2.87	-0.25	
Resilience capacity												
Absorptive capacity	38.4	53.8	15.4	***	43.1	45.5	2.4		--	--		
Adaptive capacity	45.7	55.9	10.1	***	49.3	50.9	1.6		--	--		
Transformative capacity	37.0	56.9	19.9	***	44.5	49.8	5.2		--	--		
Overall resilience capacity	44.8	59.3	14.6	***	49.9	52.7	2.8		--	--		
Economic status												
Consumption assets (indexes)	7.8	7.7	-0.1		8.4	8.1	-0.2		--	--		
Productive assets	4.4	4.3	0.0		4.3	4.3	0.0		--	--		
Animals (Tropical livestock ur	4.6	2.9	-1.7	**	3.7	5.2	1.5		--	--		
Land owned (ha)	4.3	3.1	-1.3	***	4.1	2.8	-1.3	***	--	--		
Overall asset index	24.3	22.9	-1.4		24.5	24.0	-0.6		--	--		

Notes: Asterisks represent statistical significance of the difference at 10 (*), 5(**) and 1(***) percent levels.

a/ For the baseline and midline the values are for the previous year; For RMS Round 1 the values are for the period between the midline and RMS Round 1.

7.2 Regression Analysis of the Relationship between RISE Intervention Exposure and Resilience Outcomes

Table 7.3 contains results of regression analyses examining the relationship between exposure to RISE resilience-strengthening interventions and households' resilience to shocks over the RMS period, that is, August 2018 to April 2019. Shock exposure is controlled for using the household self-reported index.

The analysis indicates a positive effect of RISE interventions on households' realized resilience. The coefficient on the treatment group dummy variable is statistically significant at the 5 percent level for both the long-term and short-term measures of realized resilience. Long-term realized resilience shows statistical significance (at the 10 percent level) for both the Burkina Faso and Niger program areas. Short-term resilience shows statistical significance for the Niger area only. It should be kept in mind, however, that lower variability in the outcome measure may be driving the low statistical significance for the Burkina Faso area.[24] The regression analysis shows no effect of RISE intervention exposure on food security stability or households' perceived ability to recover. However, it suggests there may be a positive effect on the latter for the Niger program area.

It is interesting to note that that formal education has a positive relationship with both measures of realized resilience and on food security stability and, further, that asset ownership played a role in helping households maintain their food security during the two-month periods between RMS rounds. The negative and statistically significant coefficients on the Niger-area dummy variable suggest that, beyond the other factors controlled for (including shock exposure), something unique to the Niger area reduced households' ability to recover there.

[24] The standard deviation of the short-term realized resilience measure if 5.9 for the Burkina Faso area and 7.8 for the Niger area.

Table 7.3 Regression analysis of the relationship between RISE intervention exposure and household resilience to shocks (controlling for household self-reported shock exposure)

Measure of resilience	Realized resilience				Food security stability		Perceived ability to recover	
	Total change in food security over RMS period (9 months)		Change in food security between rounds (2-month periods)					
RISE intervention exposure (High=1)	0.932	**	0.488	**	0.054		0.083	
Shock exposure index	-0.064		-0.067	***	-0.021	*	-0.001	
Initial food security	-0.729	***	-0.617	***	-0.143	***		
Adult equivalents	0.220		0.136		0.050		0.015	
AE-squared	-0.013		-0.009		-0.004		-0.001	
Percent females 0-16 a/								
Females 16-30	0.033		0.013		0.005		0.000	
Females 30 plus	0.001		0.007		-0.002		0.001	
Males 0-16	-0.006		-0.003		0.002		0.001	
Males 16-30	0.001		0.001		0.011		0.002	
Males 30 plus	0.015		0.007		-0.006		0.003	
Education: None a/								
Primary	0.565		0.160		0.307	**	0.053	
Secondary	1.445	**	0.821	***	0.303	**	0.054	
Female-adult-only hh	0.992		0.660		-0.130		0.130	
Livelihood: Other a/								
Agriculture	-0.131		0.055		0.051		0.050	
Pastoralism	-0.821		0.201		-0.011		0.028	
Asset index	0.008		0.047	***	0.002		0.005	
Niger	-3.993	***	-1.438	***	-0.243		-0.081	
Time period								
Round 2 a/								
Round 3			-2.059	***			-0.021	
Round 4			-4.573	***			-0.088	*
Round 5			-5.450	***			-0.228	***
R-squared	0.414		0.444				0.032	
Prob>F					0.001			
Number of observations	619		2,833		555		2,835	
RISE intervention exposure coefficients by program area								
Burkina Faso	0.943	*	0.470		-0.169		0.094	
Niger	1.21	*	0.511	**	0.256		0.093	*

Notes: Asterisks represent statistical significance at 10 (*), 5(**) and 1(***) % levels. *t*-stats are robust to heteroskedasticity.
a/ Reference category.

The results in Table 7.4 pertain to the same outcomes (dependent variables) but here the AFDM climate shock exposure variables are controlled for. They indicate the same positive effect of the RISE program on realized resilience for the program area as a whole and both the Burkina Faso (for long-term realized resilience) and Niger (for short-term realized resilience) areas. They indicate a positive effect of the program on food security stability in the Niger area in the face of drought. There is some weak evidence of a *negative* effect for the Burkina Faso area when the cumulative vegetation deficit is controlled for. This result is not corroborated by regressions controlling for any of the other AFDM-derived indicators of climate shock exposure.

Table 7.4 Regression analysis of the relationship between RISE intervention exposure and household resilience to shocks (controlling for village-level satellite-based shock exposure indicators)

Measure of resilience / Measure of shock exposure controlled for	Realized resilience: Total change in food security over RMS period (9 months)		Realized resilience: Change in food security between rounds (2-month periods)		Food security stability		Perceived ability to recover
All	(RISE intervention exposure coefficient, High=1)						
Cumulative rainfall deficit	1.09	**	0.360		0.314	*	0.07
Meteorological drought	1.10	***	0.475	*	0.078		0.06
Cumulative streamflow deficit	1.14	***	0.470	*	0.088		0.06
Streamflow drought	1.03	*	0.527	*	0.108		0.05
Cumulative vegetation deficit	0.12		0.743	**	-0.048		0.07
Agricultural drought	0.906	**	0.712	**	0.083		0.07
Burkina Faso							
Cumulative rainfall deficit	2.34	***	0.405		-0.007		0.097
Meteorological drought	1.08	**	0.357		-0.139		0.079
Cumulative streamflow deficit	1.07	**	0.367		-0.147		0.073
Streamflow drought	1.01		0.376		-0.04		0.061
Cumulative vegetation deficit	-0.621		0.356		-0.737	***	0.139
Agricultural drought	0.702		0.514	*	0.108		0.121
Niger							
Cumulative rainfall deficit	0.393		1.020	***	0.338	*	-0.022
Meteorological drought	0.537		1.050	***	0.284	*	-0.022
Cumulative streamflow deficit	0.483		0.857	**	0.221		0.018
Streamflow drought	0.46		1.030	***	0.286	*	-0.021
Cumulative vegetation deficit	0.547		1.060	***	0.284	*	-0.022
Agricultural drought	0.534		1.050	***	0.282	*	-0.023

Notes: Asterisks represent statistical significance at 10 (*), 5(**) and 1(***) % levels. *t*-stats are robust to heteroskedasticity.

a/ Reference category.

When an interaction term between shock exposure and the RISE treatment variables is included as an independent variable in the realized resilience regressions, we gain further insight into whether RISE increased households' resilience to shocks, and to which shocks. This analysis was undertaken for all measures of shock exposure, including the index of household self-reported shocks and the AFDM variables listed in Table 7.4. The interaction term between shock exposure and the RISE treatment variable is positive and statistically significant for two of the AFDM measures in the Niger

area: the cumulative rainfall deficit and agricultural drought. The results indicate that RISE interventions reduced the negative effect of insufficient rainfall and drought on households' resilience. In the case of rainfall deficit, they imply the following relationship between shock exposure (RF_def), being in the high-exposure (treatment) group (T), and households' long-term realized resilience (RR):

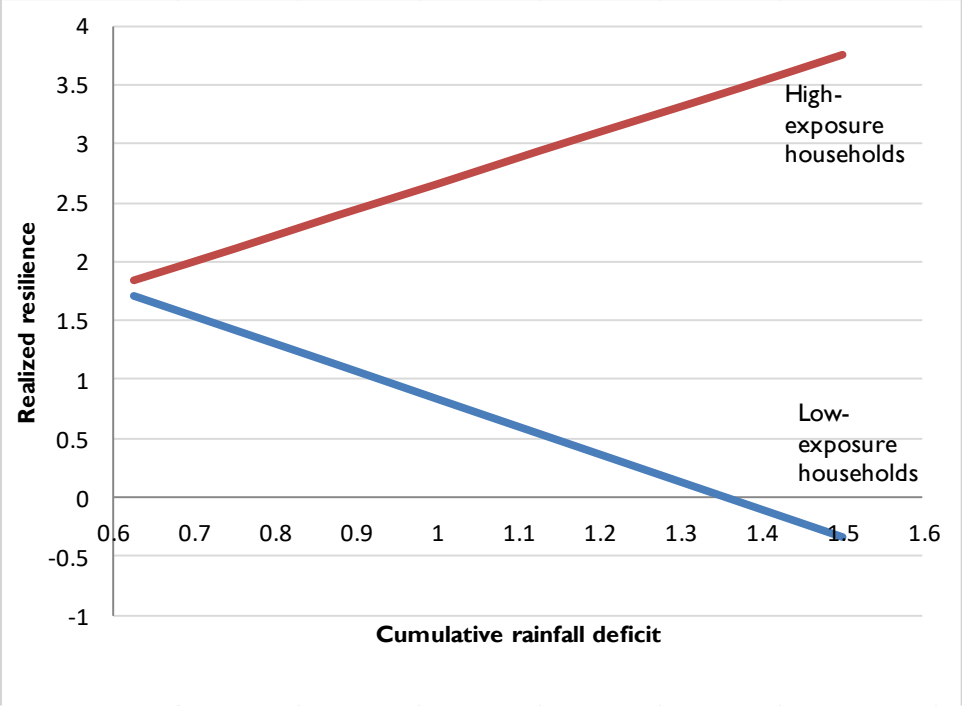
$$\text{RR} = -2.34 * RF\_def - 2.70 * T + 4.53 * RF\_def * T.$$

The estimated impact of the cumulative rainfall deficit on our measure of resilience is thus:

$$\frac{\partial RR}{\partial RF\_def} = -2.34 + 4.53 * T.$$

The relationship is illustrated in Figure 7.2, which shows the simulated trajectory of resilience as the cumulative rainfall deficit increases. As can be seen, the recovery trajectory is far better for the high-exposure group (when T=1) than the low-exposure group (T=0).

Figure 7.2 Estimated recovery trajectory as the cumulative rainfall deficit over the RMS period increases for low- and high-exposure households



When an interaction term between shock exposure and the RISE treatment variable is included in a regression with food security itself as a dependent variable the coefficient on the interaction is positive and statistically significant in the Burkina Faso area for two of the AFDM measures: streamflow surplus and flooding.

7.3 Difference-in-Difference Analysis

Difference-in-difference (DID) analysis is a descriptive technique that evaluates program effects by comparing differences in the *changes over time* of treatment and control groups in outcomes the program is attempting to improve. It thereby removes any pre-existing difference in measured outcomes of interest between the groups, differences such as those seen in Table 7.2

above. The technique relies on the "parallel trends" assumption: that the path over time of the outcome would be the same for the control and treatment groups if the program's interventions had not occurred. As we saw in Chapter 4, the measures of realized resilience are subject to substantial regression to the mean. Thus, if groups of households start out with differing values of the outcome measure of interest, then they can be expected to have differing time trends and the parallel trends assumption will be violated. The parallel trends assumption is not violated in this case as the main variable of interest, food security, did not differ between our treatment and control groups at the start of RMS 2018-19 (see Figure 7.1).

Table 7.5 contains the food security DID results. For the RMS sample as a whole, the DID for the food security index is positive and statistically significant at the 5 percent level for the food security index and at the 1 percent level for the dietary diversity score. The latter signals that the improvement in food security brought about by the project was in part through increases in dietary quality. We also find that the food security improvement may have been brought about through reducing *severe* food insecurity, whose DID is -6.9 percentage points (significant at the 10 percent level).

With respect to differences between the two program areas, the food security index DIDs for both areas are statistically significant, with the Niger area's being roughly double that of the Burkina Faso area. The dietary diversity score DID is only positive and significant for the Niger area. Note also that the DIF for severe food insecurity is negative and statistically significant at the 5 percent level for the Niger area.

Finally, Table 7.6 shows the DID results for perceived ability to recover, which imply that, as seen above, the RISE program did not have any effect on resilience as measured using subjective reports of people's ability to recover.

Table 7.5 Relationship between resilience outcomes and RISE intervention exposure: Difference-in-difference analysis for food security

Independent variable	Low exposure			High exposure			Difference in difference	
	Round 1	Round 5	Difference	Round 1	Round 5	Difference		
All								
Food security index	15.7	17	1.3	15.1	17.7	2.6	1.3	**
Percent of households								
Food secure	7.3	10.2	2.9	4.7	11.5	6.8	3.9	
Mildly food insecure	5.3	8.1	2.8	7.2	9.6	2.4	-0.4	
Moderately food insecure	33.7	49.0	15.3	32.7	51.5	18.8	3.5	
Severely food insecure	53.7	32.6	-21.1	55.4	27.4	-28	-6.9	*
Dietary diversity score	4.23	3.90	-0.33	4.10	4.63	0.53	0.86	***
Burkina Faso								
Food security index	18.30	19.00	0.7	18.40	20.00	1.6	0.9	**
Percent of households								
Food secure	12.7	13.4	0.7	6.8	15.1	8.3	7.6	*
Mildly food insecure	7.6	13.6	6	11.1	12.2	1.1	-4.9	
Moderately food insecure	37.2	58.0	20.8	47.1	63.8	16.7	-4.1	
Severely food insecure	42.5	15.0	-27.5	35.0	8.9	-26.1	1.4	
Dietary diversity score	4.17	4.13	-0.04	4.30	4.19	-0.11	-0.07	
Niger								
Food security index	12.80	13.90	1.1	11.60	14.50	2.9	1.8	**
Percent of households								
Food secure	1.0	5.6	4.58	2.5	6.5	4	-0.58	
Mildly food insecure	2.6	0.0	-2.6	3.0	5.8	2.8	5.4	***
Moderately food insecure	29.7	36.0	6.3	17.4	34.2	16.8	10.5	
Severely food insecure	66.7	58.3	-8.4	77.2	53.4	-23.8	-15.4	**
Dietary diversity score	4.30	3.67	-0.63	3.89	5.25	1.36	1.99	***

Notes: Asterisks represent statistical significance at the 10 (*), 5(**) and 1(***) percent levels.

Table 7.6 Relationship between resilience outcomes and RISE intervention exposure: Difference-in-difference analysis for perceived ability to recover

	Low exposure			High exposure			Difference in difference a/
	RMS Round 2	RMS Round 5	Difference	RMS Round 2	RMS Round 5	Difference	
All	1.98	1.79	-0.19	2.13	1.84	-0.29	-0.1
Burkina Faso	2.13	1.75	-0.38	2.30	1.86	-0.44	-0.06
Niger	1.75	1.86	0.11	1.86	1.81	-0.05	-0.16

a/ The difference-in-differences are not statistically significant.

7.4 Summary

Appropriate data for a formal impact evaluation of the RISE program will be collected as part of the endline survey. Meanwhile, in this chapter an exploratory analysis of the effect of the program to date on households' resilience to shocks was undertaken. The analysis draws on the differences across groups of households residing in low exposure villages (the "control group") and high exposure villages (the "treatment control group"). The high-exposure villages are benefiting from a set of FFP projects, REGIS-ER and/or REGIS-AG—the latter two which focus on resilience programming—while low exposure villages are not.

The methods employed are: (1) regression analysis examining the relationship between RISE intervention exposure and the four measures of resilience; and (2) difference-in-difference analysis. Various measures of shock exposure are controlled for, including the index of household-reported shock exposure and satellite-based measures of climate shock exposure from the Africa Flood and Drought Monitor, both introduced in Chapter 3.

The analysis provides suggestive evidence that the RISE program's interventions to date *have* had a positive impact on households' ability to recover from the shocks they faced over the RMS period. There is also some evidence indicating that the interventions helped Niger households maintain stability in their food security in the face of drought.

Other indications that the program helped to strengthen households' resilience is analysis signaling that it reduced the negative impact of drought on Niger-area households' ability to maintain their food security and that it reduced the negative impact of flooding on Burkina Faso-area households' food security. Overall, it appears that RISE interventions have had a stronger positive impact in the Niger program area than in the Burkina Faso area.

It is important to keep in mind that the positive associations between RISE program interventions and the resilience outcomes seen here are likely due to the program's efforts to strengthen households' resilience capacities. It will be possible to pinpoint which resilience capacities have been strengthened when new data on resilience capacities are collected as part of the final impact evaluation.

8. IMPLICATIONS FOR PROGRAMMING

The analysis carried out in this RMS report provides suggestive evidence that the RISE program interventions have had a positive impact on households' ability to recover from shocks. However, the results indicate that some additional investments may be necessary to have a bigger impact on food security and resilience. For example, the interventions that build stronger absorptive capacity should receive greater attention, especially in Niger. Some of these investments are discussed below.

Safety nets need to be redesigned and expanded. Due to the fact that the RISE program area was exposed to multiple weather induced shocks and their downstream effects over several years, agricultural production has been poor for multiple years. As a result, people have had to rely on various strategies that have enabled them to purchase food from the market much earlier than they did in previous years. This has led to the selling of assets and engagement in casual labor on other farmers' fields such that households have not used the improved agricultural activities the RISE interventions are promoting on their own fields. To enable farmers to do so, an income transfer should be considered in the Soudure period so that farmers can increase production in their own fields and not have to displace their labor to meet their food needs. Given the fact that 72.4 percent of the households in Niger were severely food insecure during the first round of this survey indicates that such a transfer is warranted.

In addition, when severe drought conditions or floods hit a localized area, indicators should be monitored to implement a crisis modifier when conditions have deteriorated. The crisis modifier could be in the form of cash or in kind (food or fodder) for those areas hardest hit. Indicators could be satellite imagery (e.g., AFDM data), market prices for grain, and the terms of trade for animal sales. Such a shock-responsive safety net has been effectively used in Northern Kenya. Currently very few households receive any humanitarian assistance (15 %). Such a crisis modifier would prevent the mass selloff of animals that were witnessed over the RMS rounds.

A third shock-responsive intervention that would help households deal with water and fodder shortages that occur during droughts is to have opportunities to have livestock offtakes that are implemented before the animals get sick or die. Households would be able to buy back animals at a later time when conditions improve. Such an approach was used effectively in the PRIME project in Ethiopia.

Due to the rise in violent extremism, households are absorbing displaced people, which puts real strains on the food security of the host households. Such households should be targeted with additional income transfers to deal with the increased food demands.

Disaster Risk Reduction activities need to expand their focus beyond droughts to include floods. Although the projects have introduced a range of activities to deal with agricultural droughts (drought tolerant crops, water catchment enhancements etc.), there needs to be more emphasis on responses to floods in areas that are susceptible to these risks.

Flood control infrastructure that can be implement through cash-for-work activities should be given more attention.

To address rising violent extremism, implement interventions that focus on conflict mitigation and provision of mental health and psychosocial support services. Violent extremism has become more serious in the RISE program areas and needs more attention. Specifically, attention should be given to the drivers of this shock so that effective preventive measures can be put in place. For example, disenfranchised youth living in the area that have few livelihood opportunities are often targeted in extremist recruiting. Traditional leaders can be instrumental in these mitigation efforts. Provision of mental health and psychosocial support services will help deal with the emotional stress from the threat of violent extremism.

Continue to invest in savings groups that can build more social capital, especially in areas where social capital is beginning to erode. Savings and social capital have continued to be important resilient capacities that help households recover from shocks. More focus on these groups in Niger will be important.

Continue to strengthen households' adaptive capacity. Many of the interventions being promoted by the RISE program are aimed at strengthening adaptive capacity. The project should continue to create opportunities for women to increase their assets (e.g., small ruminants). Access to financial services should continue to receive attention since it was one capacity that has proved important to building resilience across the different RISE surveys. Access to information and access to markets should also continue to receive attention since these capacities were also found to be important to improved resilience. In addition, continued investment in human capital through education and training will be important to future resilience.

Continue to strengthen transformative capacity. Transformative capacity is much stronger in Burkina Faso than in Niger. For example, the RMS data analysis showed that government responsiveness was much stronger in Burkina Faso. Much more emphasis can be given in Niger to strengthening access to services such as schools, veterinary services, and health care, access to infrastructure like roads, and access to formal safety nets. Improved access to potable water for both people and their animals is critical in both Burkina Faso and Niger.

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APPENDIX 1. QUANTITATIVE SURVEY QUESTIONNAIRE

Round 1 Questionnaire

RESILIENCE IN THE SAHEL ENHANCED (RISE)

Recurrent Monitoring Survey 2018:

Household Questionnaire

Round 1

Table of Contents

MODULE 1: HOUSEHOLD IDENTIFICATION COVER SHEET

DATE OF SURVEY	|__|__| |__|__| |_2_|_0__|_X__|_X__| Day Month Year

101: Country	102: Region	103: Province/District	104: Commune	105: Village
…… |__|	…… |__|__|	…… |__|__|	…… |__|__|__|	…… |__|__|__|

106. GPS Coordinates				107	108
Accuracy	**Elev**	**Lat**	**Long**	**Enumerator Code**	**Supervisor Code**
……	……	……	……	|__|__|	|__|__|

109: Compound Number |___|___|___|

110. Full Name of Head of Compound:

_____

111. Phone Number of Head of Compound:

_____

112: Full Name of Head of Household

_____

113. Phone Number of Head of Household:

_____

Confidential

MODULE 1A: INFORMED CONSENT SIGNATURE PAGE

PAGE DE SIGNATURE DU FORMULAIRE DE CONSENTEMENT ÉCLAIRÉ

Thank you for the opportunity to speak with you. We are conducting a study financed by USAID along with partners from the Government of Niger and Burkina Faso. We are conducting a recurrent monitoring survey to learn about the agriculture, food security, food consumption, nutrition, and wellbeing of households in this area. You were selected to participate in a survey that is about shocks, the responses to shocks, and well-being outcomes. Your participation is completely voluntary. If you agree to participate, you can choose to stop at any time or to skip any questions you do not want to answer. Your answers will be completely confidential; we will not share information that identifies you with anyone. Do you have any questions about the survey or about anything I have said? If you have any questions in the future about the survey or the interview or concerns or complaints, we invite you to contact:

If you have questions on this interview or concerns of complaints, we invite you to contact CESAO-AI (Coulibaly Dramane | Coordinateur Régional | Tel : (+226)73 83 43 20 / 66 63 78 42 / dramane_c@yahoo.fr) if in Burkina Faso. If in Niger: Projet USAID/SAREL (Stephen Reid | Chef de Projet, Sahel Resilience Learning (SAREL) Project | Tel. :(+227)9663-0291 / 227-9025-7197 / sreid@sarelproject.com

	Name (last and first) of the person being interviewed ***OR*** **Name (last and first) of a witness if the person is illiterate**	**Consent to participate in the survey (select one)** **YES=1 NO=2**	**Signature of the person interviewed** **OR** **Signature of witness if the person is illiterate**
1		|____|	
2		|____|	
3		|____|	
4		|____|	
5		|____|	
6		|____|	
7		|____|	
8		|____|	

MODULE 1B: INFORMED CONSENT DUPLICATE SIGNATURE PAGE

DUPLICATE TO LEAVE WITH HOUSEHOLD

Thank you for the opportunity to speak with you. We are conducting a study financed by USAID along with partners from the Government of Niger and Burkina Faso. We are conducting a recurrent monitoring survey to learn about the agriculture, food security, food consumption, nutrition, and wellbeing of households in this area. You were selected to participate in a survey that is about shocks, the responses to shocks, and well-being outcomes. Your participation is completely voluntary. If you agree to participate, you can choose to stop at any time or to skip any questions you do not want to answer. Your answers will be completely confidential; we will not share information that identifies you with anyone. Do you have any questions about the survey or about anything I have said? If you have any questions in the future about the survey or the interview or concerns or complaints, we invite you to contact:

If you have questions on this interview or concerns of complaints, we invite you to contact CESAO-AI (Coulibaly Dramane | Coordinateur Régional | Tel : (+226)73 83 43 20 / 66 63 78 42 / dramane_c@yahoo.fr) if in Burkina Faso. If in Niger: Projet USAID/SAREL (Stephen Reid | Chef de Projet, Sahel Resilience Learning (SAREL) Project | Tel. :(+227)9663-0291 / 227-9025-7197 / sreid@sarelproject.comProjet

	Name (last and first) of the person being interviewed *OR* Name (last and first) of a witness if the person is illiterate	Consent to participate in the survey (select one) YES=1 NO=2	Signature of the person interviewed OR Signature of witness if the person is illiterate
1		|____|	
2		|____|	
3		|____|	
4		|____|	
5		|____|	
6		|____|	
7		|____|	
8		|____|	

MODULE 2: ABBREVIATED HOUSEHOLD ROSTER

				201	202a	203a	202b	203b
Respondent's name	What is the relationship of the respondent to the head of household?	Phone number of respondent (Ask the respondent to provide their number. Skip to the next screen if the person refuses to respond/does not want to answer)	Sex of the head of household (Be sure not to confuse « Head of HH » with « respondent » Faire attention a ne pas confondre "chef du ménage" et "répondant") Male Female DK Refused	Have there been any changes in the last 12 months? Yes No (skip to q301) -8	How many births?	Name of the person(s) born (If there is more than one person born, insert all their names separated by a comma)	How many deaths?	Name of the person(s) deceased (If there is more than one person deceased, insert all their names separated by a comma)
		01							
		02							
		03							
		04							
		05							
		06							
		07							
		08							
		09							
		10							
		11							

MODULE 3: SHOCKS

	301	302	303	304
	In the last 12 months , did your household experience [Shock a – pp]? 1. Yes 2. No **>> Next event**	How many times did you experience this shock in the last 12 months?	What was the severity of the impact of this/these shock(s) experienced by your household in the last 2 months on your income and food consumption? 1. None 2. Slight impact 3. Moderate impact 4. Strong impact 5. Worst ever happened 8. DK 9. Refused	To what extent were you and your household able to recover after this/these shock(s) experienced by your household in the last 12 months? 1. Did not recover 2. Recovered some, but worse off than before [event] 3. Recovered to same level as before [event] 4. Recovered and better off 5. Not affected by [event] 8. DK
Climatic Shocks				
a. Excessive rains (Refers to rain that is stronger or more frequent than expected whatever the reason)				
b. Rain at inappropriate time (Refers to rain outside of the normal season)				
c. Flood/flash flood (Refers to a flood that lasts a long time, such as an unexpected flood)				
d. Too little rain/drought (Refers to the quantity if rain)				
e. Lack of rain at critical time of season (Refers to the repartition of rain during the season)				
f. Massive insect/bird invasion				
g. Lack of fodder for livestock				
h. Lack of water for livestock				
i. Polluted water due to mining activity				
j. lack of water for household consumption				
k. epizootic (animal disease outbreak) – large livestock (bovines)				
l. epizootic (animal disease outbreak) – small livestock (sheep/goats)				
m. epizootic (animal disease outbreak) – poultry				

	301	302	303	304
	In the last 12 months , did your household experience [Shock a – pp]? 1. Yes 2. No **>> Next event**	How many times did you experience this shock in the last 12 months?	What was the severity of the impact of this/these shock(s) experienced by your household in the last 2 months on your income and food consumption? 1. None 2. Slight impact 3. Moderate impact 4. Strong impact 5. Worst ever happened 8. DK 9. Refused	To what extent were you and your household able to recover after this/these shock(s) experienced by your household in the last 12 months? 1. Did not recover 2. Recovered some, but worse off than before [event] 3. Recovered to same level as before [event] 4. Recovered and better off 5. Not affected by [event] 8. DK
n. bush fires/blaze				
Conflict shocks				
o. Land conflicts (Refers to property conflicts inter- or intra-HH)				
p. Violent extremism				
q. Conflicts between farmers to herders				
r. Conflicts over potable water				
s. Conflict over access to fodder for livestock				
t. Conflict over access to water for livestock				
u. Conflict/violence involving entire communities/villages (Includes conflicts related to traditional authority, inter-village conflicts, and intra-village conflicts)				
v. Theft of assets/holdups/ burglary (animals, crops, etc.)				
Socioeconomic and other shocks				
w. Sharp food price increase (Refers to a sharp increase for the consumers)				
x. Unavailability of agricultural or livestock inputs (Refers to situations when there are no products available in the local market, no matter the price).				
y. Drop in agricultural or livestock product demand (Refers to situations when there				

	301	302	303	304
	In the last 12 months , did your household experience [Shock a – pp]? 1. Yes 2. No **>> Next event**	How many times did you experience this shock in the last 12 months?	What was the severity of the impact of this/these shock(s) experienced by your household in the last 2 months on your income and food consumption? 1. None 2. Slight impact 3. Moderate impact 4. Strong impact 5. Worst ever happened 8. DK 9. Refused	To what extent were you and your household able to recover after this/these shock(s) experienced by your household in the last 12 months? 1. Did not recover 2. Recovered some, but worse off than before [event] 3. Recovered to same level as before [event] 4. Recovered and better off 5. Not affected by [event] 8. DK
are no people who want to purchase the products)				
z. Disease/exceptional health-related expense				
aa. Debt repayment				
bb. Increase in price of agricultural or livestock inputs (Refers to the increase of prices for producers)				
cc. Drop in price of agricultural or livestock products (Refers to the decrease of prices for producers)				
dd. Job loss by household member (Refers to the job loss lasting less than 6 months)				
ee. Long-term unemployment (non-agricultural) (Refers to the job loss lasting less more than 6 months)				
ff. Abrupt end of assistance/regular support from outside the household (Refers to the support in cash or in-kind sent by another person or organization/project)				
gg. Sudden increase in household size (Refers to the absorption of displaced persons, or persons who have returned from overseas, or housing displaced persons)				
hh. Fire (house, etc....)				

	301	302	303	304
	In the last 12 months , did your household experience [Shock a – pp]? 1. Yes 2. No **>> Next event**	How many times did you experience this shock in the last 12 months?	What was the severity of the impact of this/these shock(s) experienced by your household in the last 2 months on your income and food consumption? 1. None 2. Slight impact 3. Moderate impact 4. Strong impact 5. Worst ever happened 8. DK 9. Refused	To what extent were you and your household able to recover after this/these shock(s) experienced by your household in the last 12 months? 1. Did not recover 2. Recovered some, but worse off than before [event] 3. Recovered to same level as before [event] 4. Recovered and better off 5. Not affected by [event] 8. DK
ii. Death of household member				
jj. Emigration of household member (Refers to emigration which handicaps the HH)				
kk. Serious illness of household member				
ll. Forced repatriation				
mm. Household dislocation				
nn. Collapse of economic activity (Refers to the collapse of an economic activity including agricultural activity)				
oo. Loss of production means (land, tools, plow machine) (Refers to the loss of productive means that one uses to earn a living)				
pp. Another shock that has not already been mentioned? (If so, specify other; if there is more than one, separate with a comma).				

MODULE 4: COPING STRATEGIES

401. How did you cope with the shock(s) you experienced during the past 2 months?

N°	Coping mechanisms	YES=1 NO=2
	LIVESTOCK AND LAND HOLDINGS	
a	Send livestock in search of pasture and water	|___|
b	Sell livestock	|___|
c	Slaughter livestock	|___|
d	Lease out land	|___|
e	Treat livestock	|___|
	MIGRATION	
f	Migrate (only some family members)	|___|
g	Migrate (the whole family)	|___|
h	Send children or an adult to stay with relatives	|___|
	COPING STRATEGIES TO GET MORE FOOD OR MONEY	
i	Take children out of school	|___|
j	Reduce the regular household expenses (for ex., fuel, electricity etc.) including moving to less expensive housing	|___|
k	Limit portion size at mealtimes	
l	Reduce the number of meals a day	|___|

N°	Coping mechanisms	YES=1 NO=2
	ADOPT ADDITIONAL LIVELIHOOD ACTIVITIES OR DISCONTINUE OTHERS	
Dd	Production and sale of an alternative/complementary agricultural product	|___|
Ee	Production and sale of an alternative/complementary animal product (for ex., milk, eggs, meat etc.)	|___|
Ff	Agricultural labor	|___|
Gg	Production and sale of seedlings, seeds, fodder	|___|
Hh	Production and sale of firewood, carbon, poles, lumber	
Ii	Sale of non-timber products	|___|
Jj	Employed in a marketing company for agricultural or animal products	|___|
Kk	Private provider of agricultural services (emergency veterinary, APS agricultural, etc.)	|___|
Ll	Small business (shopkeeper, sale of non-agricultural products, etc.)	|___|
Mm	Delivery agent for non-agricultural services	|___|
Nn	Technical and professional activities (For instance, carpenter, mason, bicycle or motorcycle repair, , P. ex, menuisier, maçon, réparateur de vélo ou moto, tire repair, cell phone repair, , mécanicien, réparateur de cellulaire, repair of motorised pumps, cutter, etc.)	|___|
Oo	Artisanal mining operation	|___|
Pp	Non-agricultural laborer (factory, entreprise, mine, etc.)	
Qq	Household help	|___|

401. How did you cope with the shock(s) you experienced during the past 2 months?

	COPING STRATEGIES TO GET MORE FOOD OR MONEY	
m	Take up new wage labor	|___|
n	Sell household items (e.g., radio, bed)	|___|
o	Sell production assets (cart or water pump, land, or animals, for example)Sell productive assets (e.g., plow, water pump)	|___|
p	Take out a loan from an institution/association/microfinance NGOTake out a loan from an NGO	|___|
q	Take out a loan from a bank	|___|
r	Take out a loan from a money lender	|___|
s	Take out a loan from friends or relatives	|___|
t	Send children to work for money (e.g., domestic work, for example)	|___|
u	Receive money or food from relatives	|___|
20	Receive food assistance from the government	|___|
w	Receive food assistance from an NGO	|___|
x	Participate in a food-for-work or cash-for-work program	|___|
y	Use money from savings	|___|
z	Obtain cash from a household member who has emigrated (remittances)	|___|
aa	Eating of lean season food (Anza for example) (L'anza is made of of grains : it's not edible but it's eaten during difficult times)	|___|
bb	Hunting, foraging, fishing, excavation of termite mounds	|___|
cc	Consume seed stock held for next season	|___|
Rr	Artisan (pottery, basketwork, woodwork, etc.)	|___|
Ss	Transporter, docker	|___|
Ss Other	Have there been other coping strategies to obtain more food or money that have not been mentioned? Specify (If there are no other continue to the next question)	

MODULE 5: GOVERNMENT RESPONSIVENESS

	502	503	504
	Over the last 12 months, did any community members approach the local government about improving [asset or service]?	Was the need addressed by local government?	How did the local government attempt to address the need
	Yes	Yes	Responses:
	No	No	Completely addressed/being addressed
	Does not apply	DK	Partially addressed (i.e., response completed but need not fully addressed)
	DK		Positive response, will be addressed
			Promised but not yet addressed
			Not addressed, response pending
			Not addressed, attempts failed
			Leaders did nothing
a. Roads			
b. Schools			
c. Health center/post/clinic			
d. Piped water/boreholes/wells			
e. Natural resource conservation			
f. Irrigation systems			
g. Public transportation			
h. Security			
i. Food assistance (in-kind or as cash)			
j. Fodder			
k. Habitat			
l. Conflict resolution			
m. other (specify)			

MODULE 6: FOOD INSECURITY COPING STRATEGIES

	601
In the past 7 days, if there have been times when you did not have enough food or money to buy food, how many days has your household had to do one of the following coping strategies?	Number of days out of the past seven **(Use 0 – 7 to answer number of days. Use -8 for Don't Know and -9 for Refuse)**
a. Rely on less preferred and less expensive foods?	
b. Borrow food, or rely on help from a friend or relative?	
c. Purchase food on credit?	
d. Gather wild food, hunt, or harvest immature crops?	
e. Consume seed stock held for next season?	
f. Send household members to eat elsewhere?	
(intentionally blank)*	
h. Limit portion size at mealtimes (reduce the global quantity of food in each meal)?	
i. Restrict consumption by adults in order for small children to eat?	
j. Feed working members of HH at the expense of non-working members?	
k. Reduce number of meals eaten in a day?	
l. Skip entire days without eating?	

* Note: The coping strategy "Send household members to beg" was not included in round 1 data collection, but was included in all subsequent rounds

MODULE 7: DIETARY DIVERSITY

Now I would like to ask you about the types of foods that you or anyone else in your household ate yesterday during the day and at night. Please include all food eaten both at your home, or away from home. **Read the list of foods. Choose "yes" if anyone in the household ate the food in question. Choose "no" if no one in the household ate the food.**

701	Any bread, rice, pasta, biscuits, or other foods made from barley, millet, sorghum, maize, rice, wheat?	1. Yes 2. No
702	Any foods made with potatoes, yams, sweet potatoes, Irish potatoes, manioc, taro and other tubers?	1. Yes 2. No
703	Any food made with vegetables such as onions, cabbage, green leafy vegetables, gathered wild green leaves, tomato, cucumber, mushroom, green pepper, beet root, garlic, or carrots?	1. Yes 2. No
704	Any food or fruit juices made from fruits such as mango, banana, oranges, pineapple, papaya, guava, avocado, wild fruit or apple?	1. Yes 2. No
705	Any food made from beef, lamb, goat, wild game, chicken, duck, or other birds, other meats?	1. Yes 2. No
706	Any eggs?	1. Yes 2. No
707	Any fresh fish, smoked fish, fish soup/sauce or dried fish or shellfish?	1. Yes 2. No
708	Any foods made from beans (white, brown, field), peas, chickpeas, rape seed, linseed, sesame, sunflower, vetch, soybean flour or nuts (peanut, peanut flour)?	1. Yes 2. No
709	Any cheese, yogurt, milk, powder milk, or other milk products?	1. Yes 2. No
710	Any foods made with oil, margarine, fat, or butter?	1. Yes 2. No
711	Any sugar, sugar cane, tamarind, or honey?	1. Yes 2. No
712	Any other foods, such as condiments, traditional beer, beer, wine, coffee or tea?	1. Yes 2. No

MODULE 8: HOUSEHOLD HUNGER

801	In the past four weeks, did you worry that your household would not have enough food?	1. Yes 2. No **(Skip to q802)**
801a	How often did this happen?	1. Rarely (one or twon times during the course of the last four weeks) 2. Sometimes (three to ten times during the course of the last four weeks) 3. Often (more than ten times during the course of the last four weeks)
802	In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?	1. Yes 2. No **(Skip to q803)**
802a	How often did this happen?	1. Rarely (one or twon times during the course of the last four weeks) 2. Sometimes (three to ten times during the course of the last four weeks) 3. Often (more than ten times during the course of the last four weeks)
803	In the past four weeks, did you or any household member have to eat a limited variety of foods due to a lack of resources?	1. Yes 2. No **(Skip to q804)**
803a	How often did this happen?	1. Rarely (one or twon times during the course of the last four weeks) 2. Sometimes (three to ten times during the course of the last four weeks) 3. Often (more than ten times during the course of the last four weeks)
804	In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?	1. Yes 2. No **(Skip to q805)**
804a	How often did this happen?	1. Rarely (one or twon times during the course of the last four weeks) 2. Sometimes (three to ten times during the course of the last four weeks) 3. Often (more than ten times during the course of the last four weeks)
805	In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?	1. Yes 2. No **(Skip to q806)**
805a	How often did this happen?	1. Rarely (one or twon times during the course of the last four weeks) 2. Sometimes (three to ten times during the course of the last four weeks)

		3. Often (more than ten times during the course of the last four weeks)
806	In the past four weeks, did you or any other household member have to eat fewer meals in a day because there was not enough food?	1. Yes 2. No **(Skip to q807)**
806a	How often did this happen?	1. Rarely (one or twon times during the course of the last four weeks) 2. Sometimes (three to ten times during the course of the last four weeks) 3. Often (more than ten times during the course of the last four weeks)
807	In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?	1. Yes 2. No **(Skip to q808)**
807a	How often did this happen?	1. Rarely (one or twon times during the course of the last four weeks) 2. Sometimes (three to ten times during the course of the last four weeks) 3. Often (more than ten times during the course of the last four weeks)
808	In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?	1. Yes 2. No **(Skip to q809)**
808a	How often did this happen?	1. Rarely (one or twon times during the course of the last four weeks) 2. Sometimes (three to ten times during the course of the last four weeks) 3. Often (more than ten times during the course of the last four weeks)
809	In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?	1. Yes 2. No
809a	How often did this happen?	1. Rarely (one or two times during the course of the last four weeks) 2. Sometimes (three to ten times during the course of the last four weeks) 3. Often (more than ten times during the course of the last four weeks)

MODULE 9: HUMANITARIAN ASSISTANCE

901. In the last 12 months, did your household rececive any type of support from the local government or from an international NGO?	1. Yes 2. No **(Skip to q902)** -8 DK
901a. What type of local government assistance did your household receive?	1Food assistance 2. Cash/voucher 3. Food for work (FFW)/cash for work (CFW) 4. Subsidy/social protection 5. Other -8.DK -9 Refused
901b. If other, what type of assistance?	
902. In the last two months, has your household received any assistance from the government or an NGO with feed or fodder for your animals?	1. Yes 2. No -8 DK -9 Refused
903. In the last two months, has your households received assistance from the government or an NGO with drinking water?	1. Yes 2. No -8 DK -9 Refused
904. In the last two months, has anyone in your community received assistance from the government or an NGO with access to water for animals?	1. Yes 2. No **(Skip to q906)** -8 DK -9 Refused
905. Did your animals get some of this water?	1. Yes 2. No -8 DK -9 Refused
906. In the last two months, has anyone in your community taken a child to get help at a feeding center because they did not have enough food to eat?	1. Yes 2. No -8 DK -9 Refused

THANK YOU

After the interview thank the respondent for giving you his/her time and for the co-operation in providing the information. Inform them that you will be returning to collect more information in two months. At this point invite the respondent to ask you any questions that he/she might have. Answer where you can. If you do not know the answer(s), tell the respondent that his/her questions will be forwarded to a relevant person who can respond.

Round 2-5 Questionnaire

RESILIENCE IN THE SAHEL ENHANCED (RISE)

Recurrent Monitoring Survey 2018:
Household Questionnaire
Rounds 2-5

Table of Contents

MODULE 1: HOUSEHOLD IDENTIFICATION COVER SHEET

DATE OF SURVEY	|___|___| |___|___| |_2_|_0__|_X__|_X__| Day Month Year

101: Country	102: Region	103: Province/District	104: Commune	105: Village
…… |__|	…… |__|__|	…… |__|__|	…… |__|__|__|	…… |__|__|__|

106. GPS Coordinates				107	108
Accuracy	Elev	Lat	Long	Enumerator Code	Supervisor Code
……	……	……	……	|__|__|	|__|__|

109: Compound Number |___|___|___|

110. Full Name of Head of Compound:

_____

111. Phone Number of Head of Compound:

_____

112: Full Name of Head of Household

_____

113. Phone Number of Head of Household:

_____

Confidential

MODULE 1A: INFORMED CONSENT SIGNATURE PAGE

PAGE DE SIGNATURE DU FORMULAIRE DE CONSENTEMENT ÉCLAIRÉ

Thank you for the opportunity to speak with you. We are conducting a study financed by USAID along with partners from the Government of Niger and Burkina Faso. We are conducting a recurrent monitoring survey to learn about the agriculture, food security, food consumption, nutrition, and wellbeing of households in this area. You were selected to participate in a survey that is about shocks, the responses to shocks, and well-being outcomes. Your participation is completely voluntary. If you agree to participate, you can choose to stop at any time or to skip any questions you do not want to answer. Your answers will be completely confidential; we will not share information that identifies you with anyone. Do you have any questions about the survey or about anything I have said? If you have any questions in the future about the survey or the interview or concerns or complaints, we invite you to contact:

If you have questions on this interview or concerns of complaints, we invite you to contact CESAO-AI (Coulibaly Dramane | Coordinateur Régional | Tel : (+226)73 83 43 20 / 66 63 78 42 / dramane_c@yahoo.fr) if in Burkina Faso. If in Niger: Projet USAID/SAREL (Stephen Reid | Chef de Projet, Sahel Resilience Learning (SAREL) Project | Tel. :(+227)9663-0291 / 227-9025-7197 / sreid@sarelproject.com

	Name (last and first) of the person being interviewed ***OR*** **Name (last and first) of a witness if the person is illiterate**	**Consent to participate in the survey (select one)** **YES=1 NO=2**	**Signature of the person interviewed** **OR** **Signature of witness if the person is illiterate**
1		|____|	
2		|____|	
3		|____|	
4		|____|	
5		|____|	
6		|____|	
7		|____|	
8		|____|	

MODULE 1B: INFORMED CONSENT DUPLICATE SIGNATURE PAGE

DUPLICATE TO LEAVE WITH HOUSEHOLD

Thank you for the opportunity to speak with you. We are conducting a study financed by USAID along with partners from the Government of Niger and Burkina Faso. We are conducting a recurrent monitoring survey to learn about the agriculture, food security, food consumption, nutrition, and wellbeing of households in this area. You were selected to participate in a survey that is about shocks, the responses to shocks, and well-being outcomes. Your participation is completely voluntary. If you agree to participate, you can choose to stop at any time or to skip any questions you do not want to answer. Your answers will be completely confidential; we will not share information that identifies you with anyone. Do you have any questions about the survey or about anything I have said? If you have any questions in the future about the survey or the interview or concerns or complaints, we invite you to contact:

If you have questions on this interview or concerns of complaints, we invite you to contact CESAO-AI (Coulibaly Dramane | Coordinateur Régional | Tel : (+226)73 83 43 20 / 66 63 78 42 / dramane_c@yahoo.fr) if in Burkina Faso. If in Niger: Projet USAID/SAREL (Stephen Reid | Chef de Projet, Sahel Resilience Learning (SAREL) Project | Tel. :(+227)9663-0291 / 227-9025-7197 / sreid@sarelproject.com

	Name (last and first) of the person being interviewed ***OR*** **Name (last and first) of a witness if the person is illiterate**	**Consent to participate in the survey (select one)** **YES=1 NO=2**	**Signature of the person interviewed** **OR** **Signature of witness if the person is illiterate**
1		|____|	
2		|____|	
3		|____|	
4		|____|	
5		|____|	
6		|____|	
7		|____|	
8		|____|	

MODULE 2: ABBREVIATED HOUSEHOLD ROSTER

				201	202a	203a	202b	203b
Respondent's name	What is the relationship of the respondent to the head of household?	Phone number of respondent (Ask the respondent to provide their number. Skip to the next screen if the person refuses to respond/does not want to answer)	Sex of the head of household (Be sure not to confuse « Head of HH » with « respondent » Faire attention a ne pas confondre "chef du ménage" et "répondant") Male Female DK Refused	Have there been any changes in the last 2 months? Yes No (skip to q301) -8	How many births?	Name of the person(s) born (If there is more than one person born, insert all their names separated by a comma)	How many deaths?	Name of the person(s) deceased (If there is more than one person deceased, insert all their names separated by a comma)
		01						
		02						
		03						
		04						
		05						
		06						
		07						
		08						
		09						
		10						
		11						

MODULE 3: SHOCKS

	301	302	303	304
	In the last 2 months , did your household experience [Shock a – pp]? 1. Yes 2. No **>> Next event**	How many times did you experience this shock in the last 2 months?	What was the severity of the impact of this/these shock(s) experienced by your household in the last 2 months on your income and food consumption? 1. None 2. Slight impact 3. Moderate impact 4. Strong impact 5. Worst ever happened 8. DK 9. Refused	To what extent were you and your household able to recover after this/these shock(s) experienced by your household in the last 2 months? 1. Did not recover 2. Recovered some, but worse off than before [event] 3. Recovered to same level as before [event] 4. Recovered and better off 5. Not affected by [event] 8. DK
Climatic Shocks				
qq. Excessive rains (Refers to rain that is stronger or more frequent than expected whatever the reason)				
rr. Rain at inappropriate time (Refers to rain outside of the normal season)				
ss. Flood/flash flood (Refers to a flood that lasts a long time, such as an unexpected flood)				
tt. Too little rain/drought (Refers to the quantity if rain)				
uu. Lack of rain at critical time of season (Refers to the repartition of rain during the season)				
vv. Massive insect/bird invasion				
ww. Lack of fodder for livestock				
xx. Lack of water for livestock				
yy. Polluted water due to mining activity				
zz. lack of water for household consumption				
aaa.epizootic (animal disease outbreak) – large livestock (bovines)				
bbb. epizootic (animal disease outbreak) – small livestock (sheep/goats)				
ccc. epizootic (animal disease outbreak) – poultry				
ddd. bush fires/blaze				
Conflict shocks				

	301	302	303	304
	In the last 2 months , did your household experience [Shock a – pp]? 1. Yes 2. No **>> Next event**	How many times did you experience this shock in the last 2 months?	What was the severity of the impact of this/these shock(s) experienced by your household in the last 2 months on your income and food consumption? 1. None 2. Slight impact 3. Moderate impact 4. Strong impact 5. Worst ever happened 8. DK 9. Refused	To what extent were you and your household able to recover after this/these shock(s) experienced by your household in the last 2 months? 1. Did not recover 2. Recovered some, but worse off than before [event] 3. Recovered to same level as before [event] 4. Recovered and better off 5. Not affected by [event] 8. DK
eee. Land conflicts (Refers to property conflicts inter- or intra-HH)				
fff. Violent extremism				
ggg. Conflicts between farmers to herders				
hhh. Conflicts over potable water				
iii. Conflict over access to fodder for livestock				
jjj. Conflict over access to water for livestock				
kkk. Conflict/violence involving entire communities/villages (Includes conflicts related to traditional authority, inter-village conflicts, and intra-village conflicts)				
lll. Theft of assets/holdups/ burglary (animals, crops, etc.)				
Socioeconomic and other shocks				
mmm. Sharp food price increase (Refers to a sharp increase for the consumers)				
nnn. Unavailability of agricultural or livestock inputs (Refers to situations when there are no products available in the local market, no matter the price).				
ooo. Drop in agricultural or livestock product demand (Refers to situations when there are no people who want to purchase the products)				
ppp. Disease/exceptional health-related expense				
qqq. Debt repayment				

	301	302	303	304
	In the last 2 months , did your household experience [Shock a – pp]? 1. Yes 2. No **>> Next event**	How many times did you experience this shock in the last 2 months?	What was the severity of the impact of this/these shock(s) experienced by your household in the last 2 months on your income and food consumption? 1. None 2. Slight impact 3. Moderate impact 4. Strong impact 5. Worst ever happened 8. DK 9. Refused	To what extent were you and your household able to recover after this/these shock(s) experienced by your household in the last 2 months? 1. Did not recover 2. Recovered some, but worse off than before [event] 3. Recovered to same level as before [event] 4. Recovered and better off 5. Not affected by [event] 8. DK
rrr. Increase in price of agricultural or livestock inputs (Refers to the increase of prices for producers)				
sss. Drop in price of agricultural or livestock products (Refers to the decrease of prices for producers)				
ttt. Job loss by household member (Refers to the job loss lasting less than 6 months)				
uuu. Long-term unemployment (non-agricultural) (Refers to the job loss lasting less more than 6 months)				
vvv. Abrupt end of assistance/regular support from outside the household (Refers to the support in cash or in-kind sent by another person or organization/project)				
www. Sudden increase in household size (Refers to the absorption of displaced persons, or persons who have returned from overseas, or housing displaced persons)				
xxx. Fire (house, etc....)				
yyy. Death of household member				
zzz. Emigration of household member (Refers to emigration which handicaps the HH)				
aaaa. Serious illness of household member				
bbbb. Forced repatriation				
cccc. Household dislocation				

	301	302	303	304
	In the last 2 months , did your household experience [Shock a – pp]? 1. Yes 2. No **>> Next event**	How many times did you experience this shock in the last 2 months?	What was the severity of the impact of this/these shock(s) experienced by your household in the last 2 months on your income and food consumption? 1. None 2. Slight impact 3. Moderate impact 4. Strong impact 5. Worst ever happened 8. DK 9. Refused	To what extent were you and your household able to recover after this/these shock(s) experienced by your household in the last 2 months? 1. Did not recover 2. Recovered some, but worse off than before [event] 3. Recovered to same level as before [event] 4. Recovered and better off 5. Not affected by [event] 8. DK
dddd. Collapse of economic activity (Refers to the collapse of an economic activity including agricultural activity)				
eeee. Loss of production means (land, tools, plow machine) (Refers to the loss of productive means that one uses to earn a living)				
ffff. Another shock that has not already been mentioned? (If so, specify other; if there is more than one, separate with a comma).				

MODULE 4: COPING STRATEGIES

401. How did you cope with the shock(s) you experienced during the past 2 months?

N°	Coping mechanisms	YES=1 NO=2
	LIVESTOCK AND LAND HOLDINGS	
a	Send livestock in search of pasture and water	|____|
b	Sell livestock	|____|
c	Slaughter livestock	|____|
d	Lease out land	|____|
e	Treat livestock	|____|
	MIGRATION	
f	Migrate (only some family members)	|____|
g	Migrate (the whole family)	|____|
h	Send children or an adult to stay with relatives	|____|
	COPING STRATEGIES TO GET MORE FOOD OR MONEY	
i	Take children out of school	|____|
j	Reduce the regular household expenses (for ex., fuel, electricity etc.) including moving to less expensive housing	|____|
k	Limit portion size at mealtimes	
l	Reduce the number of meals a day	|____|

N°	Coping mechanisms	YES=1 NO=2
	ADOPT ADDITIONAL LIVELIHOOD ACTIVITIES OR DISCONTINUE OTHERS	
Dd	Production and sale of an alternative/complementary agricultural product	|____|
Ee	Production and sale of an alternative/complementary animal product (for ex., milk, eggs, meat etc.)	|____|
Ff	Agricultural labor	|____|
Gg	Production and sale of seedlings, seeds, fodder	|____|
Hh	Production and sale of firewood, carbon, poles, lumber	
Ii	Sale of non-timber products	|____|
Jj	Employed in a marketing company for agricultural or animal products	|____|
Kk	Private provider of agricultural services (emergency veterinary, APS agricultural, etc.)	|____|
Ll	Small business (shopkeeper, sale of non-agricultural products, etc.)	|____|
Mm	Delivery agent for non-agricultural services	|____|
Nn	Technical and professional activities (For instance, carpenter, mason, bicycle or motorcycle repair, , P. ex, menuisier, maçon, réparateur de vélo ou moto, tire repair, cell phone repair, , mécanicien, réparateur de cellulaire, repair of motorised pumps, cutter, etc.)	|____|
Oo	Artisanal mining operation	|____|
Pp	Non-agricultural laborer (factory, entreprise, mine, etc.)	
Qq	Household help	|____|

401. How did you cope with the shock(s) you experienced during the past 2 months?

	COPING STRATEGIES TO GET MORE FOOD OR MONEY	
m	Take up new wage labor	|____|
n	Sell household items (e.g., radio, bed)	|____|
o	Sell production assets (cart or water pump, land, or animals, for example)Sell productive assets (e.g., plow, water pump)	|____|
p	Take out a loan from an institution/association/microfinance NGOTake out a loan from an NGO	|____|
q	Take out a loan from a bank	|____|
r	Take out a loan from a money lender	|____|
s	Take out a loan from friends or relatives	|____|
t	Send children to work for money (e.g., domestic work, for example)	|____|
u	Receive money or food from relatives	|____|
20	Receive food assistance from the government	|____|
w	Receive food assistance from an NGO	|____|
x	Participate in a food-for-work or cash-for-work program	|____|
y	Use money from savings	|____|
z	Obtain cash from a household member who has emigrated (remittances)	|____|
aa	Eating of lean season food (Anza for example) (L'anza is made of of grains : it's not edible but it's eaten during difficult times)	|____|
bb	Hunting, foraging, fishing, excavation of termite mounds	|____|
cc	Consume seed stock held for next season	|____|
Rr	Artisan (pottery, basketwork, woodwork, etc.)	|____|
Ss	Transporter, docker	|____|
Ss Other	Have there been other coping strategies to obtain more food or money that have not been mentioned? Specify (If there are no other continue to the next question)	

MODULE 5: GOVERNMENT RESPONSIVENESS

	502	503	504
	Over the last 2 months, did any community members approach the local government about improving [asset or service]?	Was the need addressed by local government?	How did the local government attempt to address the need
	Yes	Yes	**Responses:**
	No	No	Completely addressed/being addressed
	Does not apply	DK	Partially addressed (i.e., response completed but need not fully addressed)
	DK		Positive response, will be addressed
			Promised but not yet addressed
			Not addressed, response pending
			Not addressed, attempts failed
			Leaders did nothing
n. Roads			
o. Schools			
p. Health center/post/clinic			
q. Piped water/boreholes/wells			
r. Natural resource conservation			
s. Irrigation systems			
t. Public transportation			
u. Security			
v. Food assistance (in-kind or as cash)			
w. Fodder			
x. Habitat			
y. Conflict resolution			
z. other (specify)			

MODULE 6: FOOD INSECURITY COPING STRATEGIES

	601
In the past 7 days, if there have been times when you did not have enough food or money to buy food, how many days has your household had to do one of the following coping strategies?	Number of days out of the past seven **(Use 0 – 7 to answer number of days.** **Use -8 for Don't Know and -9 for Refuse)**
a. Rely on less preferred and less expensive foods?	
b. Borrow food, or rely on help from a friend or relative?	
c. Purchase food on credit?	
d. Gather wild food, hunt, or harvest immature crops?	
e. Consume seed stock held for next season?	
f. Send household members to eat elsewhere?	
g. Send household members to beg?	
h. Limit portion size at mealtimes (reduce the global quantity of food in each meal)?	
i. Restrict consumption by adults in order for small children to eat?	
j. Feed working members of HH at the expense of non-working members?	
k. Reduce number of meals eaten in a day?	
L. Skip entire days without eating?	

MODULE 7: DIETARY DIVERSITY

Now I would like to ask you about the types of foods that you or anyone else in your household ate yesterday during the day and at night. Please include all food eaten both at your home, or away from home. **Read the list of foods. Choose "yes" if anyone in the household ate the food in question. Choose "no" if no one in the household ate the food.**

701	Any bread, rice, pasta, biscuits, or other foods made from barley, millet, sorghum, maize, rice, wheat?	1. Yes 2. No
702	Any foods made with potatoes, yams, sweet potatoes, Irish potatoes, manioc, taro and other tubers?	1. Yes 2. No
703	Any food made with vegetables such as onions, cabbage, green leafy vegetables, gathered wild green leaves, tomato, cucumber, mushroom, green pepper, beet root, garlic, or carrots?	1. Yes 2. No
704	Any food or fruit juices made from fruits such as mango, banana, oranges, pineapple, papaya, guava, avocado, wild fruit or apple?	1. Yes 2. No
705	Any food made from beef, lamb, goat, wild game, chicken, duck, or other birds, other meats?	1. Yes 2. No
706	Any eggs?	1. Yes 2. No
707	Any fresh fish, smoked fish, fish soup/sauce or dried fish or shellfish?	1. Yes 2. No
708	Any foods made from beans (white, brown, field), peas, chickpeas, rape seed, linseed, sesame, sunflower, vetch, soybean flour or nuts (peanut, peanut flour)?	1. Yes 2. No
709	Any cheese, yogurt, milk, powder milk, or other milk products?	1. Yes 2. No
710	Any foods made with oil, margarine, fat, or butter?	1. Yes 2. No
711	Any sugar, sugar cane, tamarind, or honey?	1. Yes 2. No
712	Any other foods, such as condiments, traditional beer, beer, wine, coffee or tea?	1. Yes 2. No

MODULE 8: HOUSEHOLD HUNGER

801	In the past four weeks, did you worry that your household would not have enough food?	1. Yes 2. No **(Skip to q802)**
801a	How often did this happen?	1. Rarely (one or twon times during the course of the last four weeks) 2. Sometimes (three to ten times during the course of the last four weeks) 3. Often (more than ten times during the course of the last four weeks)
802	In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?	1. Yes 2. No **(Skip to q803)**
802a	How often did this happen?	1. Rarely (one or twon times during the course of the last four weeks) 2. Sometimes (three to ten times during the course of the last four weeks) 3. Often (more than ten times during the course of the last four weeks)
803	In the past four weeks, did you or any household member have to eat a limited variety of foods due to a lack of resources?	1. Yes 2. No **(Skip to q804)**
803a	How often did this happen?	1. Rarely (one or twon times during the course of the last four weeks) 2. Sometimes (three to ten times during the course of the last four weeks) 3. Often (more than ten times during the course of the last four weeks)
804	In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?	1. Yes 2. No **(Skip to q805)**
804a	How often did this happen?	1. Rarely (one or twon times during the course of the last four weeks) 2. Sometimes (three to ten times during the course of the last four weeks) 3. Often (more than ten times during the course of the last four weeks)
805	In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?	1. Yes 2. No **(Skip to q806)**
805a	How often did this happen?	1. Rarely (one or twon times during the course of the last four weeks) 2. Sometimes (three to ten times during the course of the last four weeks)

		3. Often (more than ten times during the course of the last four weeks)
806	In the past four weeks, did you or any other household member have to eat fewer meals in a day because there was not enough food?	1. Yes 2. No **(Skip to q807)**
806a	How often did this happen?	1. Rarely (one or twon times during the course of the last four weeks) 2. Sometimes (three to ten times during the course of the last four weeks) 3. Often (more than ten times during the course of the last four weeks)
807	In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?	1. Yes 2. No **(Skip to q808)**
807a	How often did this happen?	1. Rarely (one or twon times during the course of the last four weeks) 2. Sometimes (three to ten times during the course of the last four weeks) 3. Often (more than ten times during the course of the last four weeks)
808	In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?	1. Yes 2. No **(Skip to q809)**
808a	How often did this happen?	1. Rarely (one or twon times during the course of the last four weeks) 2. Sometimes (three to ten times during the course of the last four weeks) 3. Often (more than ten times during the course of the last four weeks)
809	In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?	1. Yes 2. No
809a	How often did this happen?	1. Rarely (one or two times during the course of the last four weeks) 2. Sometimes (three to ten times during the course of the last four weeks) 3. Often (more than ten times during the course of the last four weeks)

MODULE 9. HUMANITARIAN ASSISTANCE

901. In the last 2 months, did your household rececive any type of support from the local government or from an international NGO?	1. Yes 2. No **(Skip to q902)** -8 DK -9 Refused
901a. What type of local government assistance did your household receive?	1Food assistance 2. Cash/voucher 3. Food for work (FFW)/cash for work (CFW) 4. Subsidy/social protection 5. Other -8.DK -9 Refused
901b. If other, what type of assistance?	
902. In the last two months, has your household received any assistance from the government or an NGO with feed or fodder for your animals?	1. Yes 2. No -8 DK -9 Refused
903. In the last two months, has your households received assistance from the government or an NGO with drinking water?	1. Yes 2. No -8 DK -9 Refused
904. In the last two months, has anyone in your community received assistance from the government or an NGO with access to water for animals?	1. Yes 2. No **(Skip to q906)** -8 DK -9 Refused
905. Did your animals get some of this water?	1. Yes 2. No -8 DK -9 Refused
906. In the last two months, has anyone in your community taken a child to get help at a feeding center because they did not have enough food to eat?	1. Yes 2. No -8 DK -9 Refused

THANK YOU

After the interview thank the respondent for giving you his/her time and for the co-operation in providing the information. Inform them that you will be returning to collect more information in two months. At this point invite the respondent to ask you any questions that he/she might have. Answer where you can. If you do not know the answer(s), tell the respondent that his/her questions will be forwarded to a relevant person who can respond.

APPENDIX 2. QUALITATIVE SURVEY QUESTIONNAIRE

QUESTIONNAIRE FOR THE RMS FOCUS GROUP (45mins) AND FOR KII (30mins)

Lines/comments in *italics* are instructions

INTRODUCTION (2 minutes max)

Quick presentation of the investigation team, how long the discussion will take, what will be done with the results of the work. Explain that the discussion will be recorded and the reason behind it and the principle of confidentiality.

Ask for verbal consent, be polite but firm about the number of people included in the group (6 people maximum).

Take the identity and age of the participants for the purposes of citations.

1. INVESTIGATE SHOCKS AND THEIR IMPACTS DIFFERENTIATING BY GENDER/AGE AS WELL AS THE POSSIBLES INTERACTIONS BETWEEN SHOCKS (10mins for FGD) (5 mins for KII)

As a reminder; a shock/stress can be of a climatic nature (drought, flood) as well as economic (e.g. insecurity that affects trade) or social (prolonged illness of a key family member, death of the husband.....). On the basis of previous experiences also make sure that people understand the difference between shock/stresss and structural problems. For example, low literacy of women is not a shock but a structural problem.

Q: List of shocks/stresses: What are the unfortunate events that have affected the village members over <u>the last two/twelve months?</u> *(You can cite the following examples:* "drought, flood, locust invasion, diseases, death, livestock epidemic outbreak" .... *also ask when these events have begun and identify among these events those that have started before the two months in question and/or that last several weeks).*

A particular focus will be dedicated to shocks or stresses related to conflict and insecurity - explore the possibilities of presence/threats by armed groups, periods of insecurity linked to tensions with neighbouring communities or between (ethnic – cultivators/ herders)groups within the village,etc.

<u>For the rest of the discussion consider only major events</u> (maximum three although the initial list of shocks/stresses can be longer) and discuss them one by one by exploring the following questions:

Q: Which categories of people were most affected by Event X, Y or Z? How and why? *(Keep in mind the following oppositions: rich/poor; young/old people, women/men, farmers/pastoralists) - explore why some groups are more exposed than others. Is it due to the nature of the shock/stress itself or the consequence* of social *factors (some people/groups are made* more vulnerable by the existence of certain social *practices/beliefs/social constraints)?*

If the group or key-informer has listed an idiosyncratic shock, ask them to justify why they listed this event (what makes it special?)

Repeat these questions for the other major events originally listed by the group.

Q: Combination: Do some of these events combine or interact (strengthen) or follow each other? And why *(explore interactions, possible associations between these shocks and/or stresses)*

2. EXPLORER THE RESPONSE MECANISMS PUT IN PLACE AT BOTH HOUSEHOLD AND COLLECTIVE (COMMUNITY) LEVEL (25mins for FGD) (15 mins for KII)

Q: How do households react to event X (or Y or Z)? What strategies are they putting in place? *(Get a RAPIDE description of the different strategies/responses adopted by the households for this specific shock - do these strategies have negative effects on household members?). This question is only there to introduce the following questions*

Q: Why do households adopt these strategies *(is it because they are the only strategies they can adopt/they have no choice - or because they know they are very effective responses).*

Q: Are these strategies/responses the same for all households? if not why? *(Keep in mind the following oppositions: rich/poor; young/old people, women/men, farmers/pastoralists)*

Q: Dynamic strategies over time: do strategies evolve/do households change strategies over time? if so how and why? *This question is particularly relevant for shocks/stresses that began more than two months ago*

(What factors influence the choice of strategies, why do some households change? Do they change because the impact of shock/stress changes/decreases, or because they are starting to recover and no longer need to apply this type of response?)

Repeat these questions for the other major events originally listed by the group.

3. COMMUNITY STRATEGIES (5 mins)

Q: Are there also strategies in place at the community level?

Q: Do all members of the community benefit from these community responses? *(Keep in mind the following oppositions: young/old people, women/men, farmers/pastoralists, etc.*)

4. PROGRAMME ROLE (5 mins)

Q: Do certain ACTIVITIES in the RISE program help people in relation to Event X (or Y or Z)? *(Does the activity in question help because it prevents the household from adopting certain bad strategies; or because it helps to recover more quickly? or something else?)*

Q: Do all members of the community benefit equally from the contribution of this activity? *(Keepin mind the following oppositions: young/old people, women/men, farmers/pastoralists)*