



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative



ETHIOPIA

Pastoralist Areas Resilience Improvement and Market
Expansion (PRIME) Project Impact Evaluation

Report of Recurrent Monitoring Survey 2 (2015/16)

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FROM THE AMERICAN PEOPLE

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TABLE OF CONTENTS

Acknowledgements.....	iii
Table of Contents.....	iv
List of Figures.....	vi
List of Tables.....	vii
List of Acronyms.....	viii
Executive Summary.....	ix
I. Introduction.....	I
1.1 The PRIME Project.....	1
1.2 Description of the PRIME Project IE Areas: Borena and Jijiga.....	2
1.3 Background on the Recurrent Monitoring Surveys.....	4
1.4 Objective of this Report and Research Questions.....	4
1.5 Resilience and Resilience Capacity.....	5
1.6 Organization of the Report.....	6
2. Methodology.....	7
2.1 Data Collection: Quantitative Survey.....	7
2.1.1 Sampling Design.....	7
2.1.2 Quantitative Survey Questionnaire.....	9
2.2 Data Collection: Qualitative Survey.....	13
2.3 Analysis of the Quantitative Data.....	14
2.3.1 Descriptive Analysis.....	14
2.3.2 Multivariate Regression Analysis.....	14
2.4 Analysis of the Qualitative Data.....	18
3. Household Shock Exposure.....	20
3.1 The Context: Evolution of the Drought.....	20
3.2 Household Reports of Drought and Its Downstream Impacts.....	25
3.2.1 Direct Exposure to the Drought.....	25
3.2.2 Downstream Drought Impacts: Agricultural Production and Livestock Rearing.....	27
3.2.3 Downstream Drought Impacts: Price and Demand Effects.....	28
3.2.4 Downstream Drought Impacts: Conflict Shocks and Death.....	29
3.2.5 Downstream Drought Impacts: Asset Ownership.....	30
3.2.6 Downstream Drought Impacts: Children’s Nutritional Status.....	31
3.3 Correlations Across Shocks.....	32
3.4 Overall Measures of Shock Exposure.....	33
3.5 Summary: Household Shock Exposure.....	36
4. Household Food Security and Resilience in the Face of the Drought.....	37
4.1 Changes in Food Security over the RMS-2 Period.....	37
4.2 Household Resilience in the Face of the Drought.....	40
4.3 Identification of Resilience Positive Deviants.....	42
4.4 A Note Regarding Resilience Measurement Using Asset Ownership Data in RMS-2.....	44
4.5 Qualitative Data on Food and Livelihood Security During the Drought.....	44
4.6 Summary: Household Food Security and Resilience in the Face of the Drought.....	47
5. Household Response: Coping Strategies Employed for Dealing with the Drought.....	48
5.1 Quantitative Data on Coping Strategies.....	48
5.1.1 RMS-2 Households’ Reports of Their Coping Strategies.....	48

5.1.2	Comparison of Coping Strategies Used by RMS-1 and RMS-2 Households	51
5.1.3	How Coping Strategies Changed Over the Course of the Drought	53
5.1.4	Strategies Employed by the Resilience Positive Deviants	55
5.2	Qualitative Data on Coping Strategies	56
5.3	Summary: Household Response: Coping Strategies for Dealing with the Drought	68
6.	Drought Recovery: The Role of PRIME Project Interventions	69
6.1	Evidence on the Impact of the PRIME Project on Households' Resilience in the Face of Drought.....	69
6.1.1	Standard Growth Regressions.....	71
6.1.2	Positive Deviant Probit Regressions	73
6.1.3	Has the PRIME Project Helped Prevent Unplanned Livestock Deaths?	76
6.2	Impacts of PRIME Interventions on Household Coping Strategies.....	79
6.3	Summary: Drought Recovery: The Role of PRIME Project Interventions	81
7.	Drought Recovery: The Role of Humanitarian Assistance	82
7.1	Humanitarian Response to the Drought in the PRIME IE Area	82
7.2	Evidence on the Impact of Humanitarian Assistance	84
7.2.1	Standard Growth Regressions.....	85
7.2.2	Positive Deviant Probit Regressions	86
7.2.3	Did the Timing of Food Aid Matter?	89
7.3	Impacts of Humanitarian Assistance on Household Coping Strategies	92
7.4	Qualitative Data on Humanitarian Assistance	94
7.5	Summary: Drought Recovery: The role of Humanitarian Assistance	97
8.	Drought Recovery: The Role of Households' Resilience Capacities	98
8.1	Indicators of Resilience Capacity	98
8.2	Resilience to the Drought: Evidence on the Impact of Households' Resilience Capacities.....	99
8.3	Evidence on the Impact of Households' Resilience Capacities on Their Coping Strategies	101
8.4	Is Greater Resilience Capacity Associated with Lower Reliance on Humanitarian Assistance?.....	103
8.5	Summary: Drought Recovery: The Role of Households' Resilience Capacities.....	106
9.	Conclusions and Program Implications	107
Appendix 1:	Quantitative questionnaire	110
	MODULE 1: HOUSEHOLD IDENTIFICATION COVER SHEET	110
	MODULE 1a. INFORMED CONSENT SIGNATURE PAGE.....	111
	MODULE 1a. INFORMED CONSENT DUPLICATE SIGNATURE PAGE.....	112
	MODULE 2. SHOCKS.....	113
	MODULE 3. FODDER AND WATER AVAILABILITY.....	116
	MODULE 4. FOOD INSECURITY COPING STRATEGIES.....	117
	MODULE 5. HOUSEHOLD DIETARY DIVERSITY.....	118
	MODULE 6. HOUSEHOLD HUNGER.....	119
	MODULE 7. ASSET OWNERSHIP	121
	MODULE 8. HUMANITARIAN ASSISTANCE	123
Appendix 2:	Topical outlines for qualitative data collection	125
	Focus Group Interview (men and women separately)	125
	Topical Outline – Key Informant Interviews.....	128
References.....		129

LIST OF FIGURES

Figure 1: PRIME project intervention areas	2
Figure 2. Percent of pastoralists, agro-pastoralists, and non-pastoralists, by project area	3
Figure 3: Location of Borena within Oromiya region.....	11
Figure 4: Location of Jijiga within Somali region	12
Figure 5: Spread of the 2015/16 El Niño-induced drought, March-September 2015	21
Figure 6: Spread of the 2016 Indian Ocean Dipole-induced drought as of October 2016	22
Figure 7: Rainfall deviation from norm in Borena and Jijiga, Jan. 2015-Dec. 2016.....	23
Figure 8: Normalized difference vegetation index percentile in Borena and Jijiga, Jan. 2015- Dec. 2016.....	23
Figure 9: Soil moisture percentile in Borena and Jijiga, Jan. 2015-Dec. 2016	24
Figure 10: Asset ownership at baseline compared to RMS-2 rounds, by project area.....	31
Figure 11: Percent of households reporting that a child in their kebele was taken to a therapeutic feeding center in the past two months, by round and project area	32
Figure 12: Food security index at baseline compared to RMS-1 and RMS-2 rounds, by project area	39
Figure 13: Probability density of the change in food security between RMS-2 Rounds 1 and 6	41
Figure 14: Change in food security over the RMS-2 rounds for households with the greatest and least resilience.....	41
Figure 15: Percent of positive deviants, by project area and pastoral status	42
Figure 16: Estimated recovery trajectory as shock exposure increases for low- and high-intensity PRIME project households.....	73
Figure 17: Percent of positive deviants among low- and high-intensity project households, by project area.....	74
Figure 18: Predicted probability of unplanned cattle and goat deaths as shock exposure increases for low- and high-intensity PRIME project households.....	78
Figure 19: Estimated food security trajectory as shock exposure increases for food/cash-for-work receivers and non-receivers	85
Figure 20: Percentage of positive deviants among humanitarian assistance receivers and non-receivers	87
Figure 21: Percentage of households receiving food aid, by RMS-2 round	89
Figure 22: Percentage of households first receiving food aid in each RMS-2 round	90
Figure 23: Estimated resilience trajectory as shock exposure increased, by timing of first food aid receipt (Jijiga)	92
Figure 24: Indicators of household resilience capacity	98
Figure 25: Relationship between the probability of receiving food aid and absorptive capacity	105

LIST OF TABLES

Table 1:	RMS-2 rounds: Dates of data collection.....	7
Table 2:	The PRIME RMS-2 analysis sample.....	9
Table 3:	Rainy seasons in Borena and Jijiga in relation to the RMS-2 data collection.....	21
Table 4:	Percent of households experiencing drought-related shocks over the RMS-2 period, by project area.....	26
Table 5:	Asset ownership at baseline compared to RMS-2 rounds, by project area.....	31
Table 6:	Correlation matrix: Incidence of shocks.....	33
Table 7:	Summary measures of shock exposure, by project area and pastoralist status.....	35
Table 8:	Food security at baseline compared to RMS-1 and RMS-2 rounds, by project area.....	38
Table 9:	Resilience in the face of the drought, by project area and pastoralist status.....	40
Table 10:	Comparison of food security, shock exposure, and household characteristics of positive deviants and non-PDs.....	43
Table 11:	Percent of households employing various coping strategies in any RMS-2 round, by project area and pastoralist status.....	49
Table 12:	Percent of households employing various coping strategies: Comparison of the RMS-1 and RMS-2 surveys.....	52
Table 13:	Percent of households employing coping strategies, by RMS-2 round and project area.....	54
Table 14:	Comparison of coping strategies employed by positive deviants and non-positive deviants ...	55
Table 15:	Comparison of baseline characteristics of low-intensity and high-intensity RMS-2 households.....	71
Table 16:	Has the PRIME project enhanced households' resilience to drought? Food security growth regression results.....	72
Table 17:	Has the PRIME project helped prevent unplanned livestock deaths? Probit regression.....	77
Table 18:	Association between PRIME project intervention intensity and households' use of coping strategies: probit regression results.....	80
Table 19:	Percent of households receiving various types of humanitarian assistance over the RMS-2 period, by project area and pastoralist status.....	82
Table 20:	Percent of households receiving various types of humanitarian assistance across the RMS-2 rounds, by project area.....	83
Table 21:	Comparison of initial characteristics of humanitarian assistance receivers versus non-receivers.....	84
Table 22:	Did humanitarian assistance increase households' resilience to drought? Food security growth regression results.....	86
Table 23:	Is humanitarian assistance a determinant of resilience positive deviance?: probit regression results.....	88
Table 24:	Did early timing of humanitarian assistance matter for households' resilience to the drought? Food security growth regression results.....	91
Table 25:	Association between humanitarian assistance and households' use of coping strategies: probit regression results.....	93
Table 26:	Which resilience capacities helped households recover from the drought? Growth regression and positive-deviance probit regression results.....	100
Table 27:	Summary: Which resilience capacities are associated with the coping strategies households used in response to the drought?.....	102
Table 28:	Summary: Association between resilience capacities and humanitarian assistance.....	104

LIST OF ACRONYMS

AFDM	African Flood and Drought Monitor
BFS	Bureau for Food Security
CMAM	Community Management of Acute Malnutrition
CSI	Coping Strategies Index
DAO	District Agriculture Officers
EA	Enumeration Area
FEWSNET	Famine Early Warning System Network
FGDs	Focus Group Discussions
GIS	Geographical Information System
HFIAS	Household Food Insecurity Access Scale
HI	High Intensity
IE	Impact Evaluation
IMS	Interim Monitoring Survey
KIIs	Key Informant Interviews
LI	Low Intensity
NDVI	Normalized Difference Vegetation Index
NGO	Non-Governmental Organization
NMA	National Meteorological Agency of Ethiopia
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
OTP	Outpatient Therapeutic Program
PC	Pastoral Clusters
PCA	Principal Components Analysis
PPS	Probability Proportional to Size
PRIME	Pastoralist Areas Resilience Improvement and Market Expansion
PSNP	Productive Safety Nets Program
SNNP	State of Southern Nations, Nationalities and Peoples
SPI	Standardized Precipitation Index
TFP	Therapeutic Feeding Program
TOT	Terms of Trade
UNESCO	United Nations Educational, Scientific and Cultural Organization
USAID	United States Agency for International Development
WASH	Water, Sanitation, and Hygiene
WFP	World Food Programme

EXECUTIVE SUMMARY

The Pastoralist Areas Resilience Improvement and Market Expansion (PRIME) project was launched in October 2012 in one of the most shock-prone areas of the world, the drylands of Ethiopia. A key objective of the project is to enhance the resilience of households to shocks. In particular, it aims to enable households to withstand and recover from the recurrent climate-related shocks—mainly drought—to which they are subjected. The analysis in this report is being undertaken as part of an impact evaluation (IE) of the project that aims to determine how its interventions affected households' resilience to shocks and, thus, poverty, food security, and children's nutritional status in the project area. The IE is focused on two regions within the wider project area: Borena and Jijiga.

This report presents analysis of the data collected in the PRIME IE Recurrent Monitoring Survey 2 (RMS-2). This survey is the second of two interim surveys conducted between the project's baseline (December 2013) and endline (planned for December 2017) surveys. The purpose of the PRIME IE RMSs is to collect real-time data during an actual shock in order to understand how, in a time of increasing climatic variability, droughts affect households' well-being and their responses (coping strategies), and what can help them recover.

The shock that is the subject of RMS-2 is the El Niño-induced drought of 2015/16 and following continued drought into late 2016. In response to the drought onset, RMS-2 was launched in October 2015. The survey was administered to 400 households in 18 kebeles (communities) once every two months for a total of six rounds over a year's period. Both quantitative and qualitative data were collected.

The objective of this report is to understand the severity of the drought and its downstream impacts, how households coped with it, and the roles of three factors in their ability to recover from it: PRIME project interventions, humanitarian assistance, and households' resilience capacities. The specific research questions explored are:

1. How did the severity of the drought evolve over the RMS-2 period? What downstream shocks (e.g., food price changes and conflict) did households experience and, reflecting the complex risk environment of the PRIME area, how did these shocks co-occur?
2. How did households' food security change over the course of the drought? Which types of households were able to maintain or recover their food security, that is, which were resilient to the drought's impacts?
3. What coping strategies did households employ to deal with the drought? How did these change as the drought progressed?
4. Did PRIME project interventions assist households in their recovery from the drought? How did they affect households' coping strategies?
5. What was the role of humanitarian assistance in households' recovery? Did the timing of food aid matter? How did assistance affect households' coping strategies?

6. Did households' baseline resilience capacities help protect them from the drought's negative impacts? Which specific capacities were most protective? How were households' coping strategies affected by their resilience capacities? Is greater resilience capacity associated with lower reliance on humanitarian assistance?

Household shock exposure

The extended drought episode that took place over the RMS-2 period was induced by two weather phenomenon: (1) the 2015/16 El Niño Southern Oscillation, which led to what was considered Ethiopia's worst drought in more than 50 years; and (2) the negative Indian Ocean Dipole, which was spread more broadly across the East Africa region. The extreme weather conditions led to three consecutive failed rainy seasons, exposing households in the PRIME IE area to numerous downstream drought impacts. Data from secondary sources and both the quantitative and qualitative surveys concur that the drought was a major shock to livestock rearing and agricultural production. The majority of households experienced crop losses and/or crop diseases at some point over the RMS-2 period. Problems of insufficient fodder and water for livestock and consequent livestock disease, emaciation and unplanned deaths were widespread.

The shocks to agricultural production and livestock rearing both stemmed from and compounded economic shocks. Nearly all households in the IE area experienced food price inflation at some point over the study period. Drops in demand for agricultural and livestock products, decreases in their prices, and increases in the prices of inputs were also widespread.

With respect to asset holdings, Borena households registered a steady reduction in asset holdings as the drought progressed, and a marked drop from the baseline, revealing the toll that the multiple shocks over the previous four years have had. The same pattern of asset depletion was not found for Jijiga households, who had considerably lower asset holdings to start.

The resource scarcities associated with climate shocks such as drought can often result in increased conflict. While qualitative survey respondents did not feel that conflict between community members had increased as a result of the drought, the quantitative data reveal a distinct uptick in thefts of livestock or crops and other conflict shocks, such as theft of money and violence against household members. As for RMS-1, respondents did identify increased conflict between married couples as one way the drought was affecting households.

Qualitative data collection respondents stated that the drought had a significant negative impact on women, the elderly, and children. They indicated that women end up walking longer distances in search of water and food for small livestock, which takes time away from child care, income generating activities, food preparation, and other household activities. They felt that lactating women and children suffered the most nutritionally from the drought conditions.

Reflecting the negative food security impacts of the drought (see below), secondary data and analysis of the quantitative survey data both indicate that it took a toll on children's nutritional status, finding increased admissions to therapeutic feeding centers of children under five, particularly in Borena.

Household food security and resilience in the face of the shock

The measure of food security relied on in the report is the inverse of an experiential indicator of food insecurity, the Household Food Insecurity Access Scale, that combines information on the sufficiency of food consumption with that on the quality of households' diets. The experiences of the IE regions with regard to food security over the course of the drought episode differ substantially. In Borena, food security had dropped substantially between the baseline and RMS-2 Round 1 (by 29 percent), but showed no continued deterioration across the RMS-2 rounds. By contrast, in Jijiga, food security was higher in RMS-2 Round 1 than it was at baseline (by 19 percent), but the average household experienced a continual decline as the drought progressed. These patterns are likely influenced by the humanitarian response to the drought (addressed below).

Individual households' resilience to the drought is measured using two indicators: the change in food security they experienced over the RMS-2 rounds and a perceptions-based indicator of their ability to recover from the drought and its downstream impacts. Analysis of the former measure indicates that roughly half (51.3 percent) of households in the IE area were able to get back to their pre-drought food security or better by round 6 of the data collection. The other half were not. The two indicators of resilience concur that (1) households' resilience to the drought was far lower, on average, in Jijiga than Borena; (2) pastoralists as a group were more resilient than non-pastoralists; and (3) agro-pastoralists, who depend on both farming and pastoralism for their livelihoods, were the least resilient.

The qualitative data concur that a primary impact of the low rainfall and drought is food insecurity. Respondents linked the inability of households to maintain their food security with reduced productivity in agriculture, limited alternative livelihoods options, and limited trading opportunities due to scarcity of markets.

Household response: coping strategies for dealing with the drought

In all RMS-2 rounds the most commonly-reported strategy used by households to cope with the drought was to reduce food consumption, a sign of how fragile households' food security was in the face of this severe drought. Other widely employed strategies identified in the quantitative data fall into three broad categories: disposing of assets, financial strategies, and relying on assistance of others. The most commonly employed strategy involving assets was to sell livestock. Borrowing money from friends or relatives, purchasing food on credit, and drawing down on savings were the most common financial strategies. The greatest source of assistance from others was money or food from family members or non-relatives living outside of one's village.

Many coping strategies were less prevalent in RMS-2 than they were in RMS-1 or showed a declining trend over the RMS-2 rounds. These include slaughtering livestock, taking up new wage labor, migration and, notably, relying on friends and relatives for food or money. These trends are a sign of widespread dwindling resources and income generating opportunities; they are an indication that, following a series of multiple, back-to-back shocks, coping strategies exhaustion was setting in. While reliance on family members declined over the course of the drought, there was an increase

in reliance on assistance from non-relatives and people living outside of one's own community. These trends indicate that as households' most immediate sources of informal assistance began drying up they turned to their wider pool of social capital, to households less exposed to the drought. Two coping strategies that saw an increase both from RMS-1 to RMS-2 and across the RMS-2 rounds was drawing down on savings and receiving food aid from the government. The latter is likely related to the Ethiopian government's strong response to the 2015/16 El Niño drought.

Consistent with the quantitative data, the qualitative data point to relying on social capital and selling livestock as two major strategies used by households to cope with the drought. Other important strategies identified in the qualitative data are: diversification of income sources or foods eaten, migration with livestock to places with better pasture and water, storing water and grain, relying on community leaders for mobilizing resources, and using local early warning information. Of note, participants in Jijiga and Borena report that communities do not have access to formal early warning information and rely instead on traditional methods of prediction of climate conditions.

Drought recovery: The role of PRIME project interventions

A full impact evaluation of the PRIME project employing advanced evaluation techniques will be undertaken following the collection of endline data in late 2017. Meanwhile, this report investigated whether the project's activities up to and including the RMS-2 period have served to enhance households' resilience to drought. Regression analyses confirm that drought exposure had a negative effect on households' ability to recover from drought. They indicate that **the PRIME project's interventions to date have served to reduce that negative effect of drought exposure and, thus, that the project has had a positive effect on households' resilience.** Further analysis shows that one of the pathways through which the positive effect may have been brought about was reducing unplanned deaths of cattle and goats. With respect to coping strategies, the analysis suggests that **the project reduced households' reliance on borrowing from money lenders and reliance on non-family members for help with food and money.** In turn, it increased borrowing from friends and relatives, an option likely to have less negative consequences for future indebtedness. With regard to labor patterns, the analysis finds that **PRIME interventions reduced the need for households to turn to new wage labor and food-for-work or cash-for-work in order to cope with the drought.**

Drought recovery: The role of humanitarian assistance

The three most common types of humanitarian assistance received by households during the drought were food aid, food/cash-for-work, and cash assistance. **This report found evidence that both food aid and food/cash-for-work had a positive effect on households' ability to recover from the drought.** Such evidence was not found for cash assistance, but it is noted that the regression estimates for this type of assistance are likely downward biased (because of proactive targeting to households in greater need).

Focusing specifically on food aid, the chapter looked at whether the early timing of assistance, which is thought to be critical for saving lives, livelihoods, and financial resources for longer-term development, mattered for households' recovery. **The quantitative analysis found evidence of a positive impact of early receipt (beyond and above receipt of food aid at all), being particularly strong for Jijiga.**

With respect to coping strategies, the humanitarian assistance received by households appears to have reduced households' reliance on a number of coping strategies, including selling or slaughtering livestock, consuming seed stock, relying on help from friends and family members, drawing down on savings, and buying food on credit. The results confirm the role of food aid, in particular, in bolstering households' food consumption: **food aid is associated with less use of the coping strategy "reduce food consumption."** The qualitative data confirm that, although direct food assistance provided by the government or NGOs may have been insufficient compared to need, it was **critical for people's survival during the drought**, representing for some, their only means of daily subsistence.

Drought recovery: The role of households' resilience capacities

The analysis finds that, along with PRIME interventions and humanitarian assistance, households' own prior resilience capacities likely played a strong role in their recovery from the drought. The following resilience capacities, grouped into the three dimensions of resilience capacity—absorptive, adaptive and transformative—were found to have enabled households to recover from the 2015/16 El Niño and Indian Ocean Dipole droughts:

Absorptive capacities

- Bonding social capital
- Cash savings
- Access to informal safety nets
- Availability of hazard insurance
- Disaster preparedness and mitigation
- Asset ownership

Adaptive capacities

- Bridging social capital
- Access to financial resources
- Human capital
- Exposure to information
- Asset ownership

Transformative capacities

- Bridging social capital
- Access to markets
- Availability of formal safety nets

One community resilience capacity, the presence of a civic group in households' communities, was also found to have enabled households' resilience.

The above capacities reduced households' reliance on a number of coping strategies, including seeking out new wage labor, receiving food or money from family members, selling or slaughtering livestock, drawing down on savings, and using children as a source of labor.

Households' overall absorptive capacity and many of the individual resilience capacities are associated with lower receipts of humanitarian assistance, including asset ownership, bonding social capital, access to markets, access to communal natural resources, disaster risk reduction, and social protection at the community level. This finding suggests that **investment in boosting certain resilience capacities as a preventative measure can reduce the large development costs associated with emergency response.**

Conclusions and program implications

This RMS-2 analysis provides preliminary evidence that the interventions of the PRIME project, the main goal of which are to “reduce poverty and hunger by enhancing resilience to climate change,” have served to enhance household resilience to drought. Humanitarian assistance (food aid and food/cash for work), particularly early assistance, was also found to have a positive effect on a household's ability to recover. Certain resilience capacities possessed by households played an additional important role, including asset ownership (especially livestock), social capital, access to financial resources (savings and credit), human capital, access to markets, access to information, and the availability of formal safety nets. Strengthening all of these capacities are key priorities of the PRIME project. Many of the resilience capacities are associated with lower receipt of humanitarian assistance. These findings suggest that investments that strengthen certain resilience capacities can reduce the need for large humanitarian assistance responses.

The importance of these resilience capacities in enabling households to manage shocks in order to maintain well-being levels and reduce reliance on outside assistance will be further investigated using the data collected in the endline survey that took place in December 2017. The analysis will be a full impact evaluation of the PRIME project employing advanced evaluation techniques to determine which interventions or combination of interventions strengthened which particular capacities that, in turn, led to greater household resilience to drought in the project area.

Meanwhile, the following are the **program implications** stemming from the analysis of this report:

- Comprehensive, multi-sectoral programming has helped strengthen household and community resilience capacities to manage drought. Households that are exposed to layering, sequencing and integrating of multiple interventions are more likely to manage and recover from droughts and their downstream effects than those that are not, and are less likely to turn to negative coping strategies.
- Protecting livestock assets from unplanned deaths through fodder and water provision, market off-take and veterinary services can be critical to helping households manage shocks.
- Access to financial services and markets are also critical for diversifying livelihoods into activities not as susceptible to climatic risks.
- More focus must be given to promoting successful livelihood opportunities for people moving out of pastoralism. As youth move to urban areas, investment in their human capital (such as soft skills training related to job readiness) and improvements in their access to information will help prepare them for other employment options.
- Social capital, which is critical to resilience, can be strengthened through group formations such as formation of savings groups, natural resource management committees, pasture management groups, livestock marketing groups, etc. Projects need to do a better job tracking improvements in collective action as trust between group members increases.
- Using good trigger indicators to determine the timing, scale, and duration of formal transfers (cash and food) can be critical to enabling households to manage drought without turning to negative coping strategies. Early receipt of such transfers can lead to early recovery, reducing the need for extensive humanitarian assistance.
- Hazard insurance and disaster risk reduction interventions also show promise as protective measures that lessen the impact of droughts.



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I. INTRODUCTION

The Pastoralist Areas Resilience Improvement and Market Expansion (PRIME) project, funded under the United States Government’s Feed the Future initiative,¹ was launched in October 2012 in one of the most shock-prone areas of the world, the drylands of Ethiopia. A key objective of the project is to enhance the resilience of households to shocks. In particular, it aims to enable households to withstand and recover from the recurrent climate-related shocks—mainly drought—to which they are subjected.

The analysis of this report is being undertaken as part of an impact evaluation (IE) of the project² that aims to determine how its interventions affected households’ resilience to shocks and, thus, poverty, food security, and children’s nutritional status in the project area. The report presents analysis of the data collected in the PRIME IE Recurrent Monitoring Survey 2 (RMS-2), the second of two interim surveys conducted between the project’s baseline (December 2013) and endline (planned for December 2017) surveys. The purpose of the RMS is to collect real-time data during an actual shock in progression in order to understand how, in a time of increasing climatic variability, droughts affect households’ well-being, their responses (coping strategies), and what can help them recover. The shock that is the subject of RMS-2 is the El Niño-induced drought of 2015/2016 and subsequent continued drought into late 2016 related to the Indian Ocean Dipole weather phenomenon (see Chapter 3).

I.1 The PRIME Project

The PRIME project’s overall goal is to reduce poverty and hunger by enhancing resilience to climate change through market linkages in the drylands of the Somali, Afar, and Oromiya regional states of Ethiopia. To achieve this goal, the project strives to meet the following five “Intermediate Results”:

1. Improve productivity and competitiveness of livestock and livestock products;
2. Enhance pastoralists’ adaptation to climate change;
3. Strengthen alternative livelihoods for households transitioning out of pastoralism;
4. Ensure enhanced innovation, learning and knowledge management;
5. Improve nutritional status of targeted households through targeted, sustained, and evidence-based interventions.

¹ Feed the Future seeks to address global food insecurity in 19 focus countries by accelerating growth of the agricultural sector, addressing the root causes of undernutrition, and reducing gender inequality. USAID is responsible for leading the government-wide effort to implement the Feed the Future initiative, whose high-level target is: “to reduce by 20 percent the prevalence of poverty and the prevalence of stunted children under 5 years of age in the areas where we work.” (USAID 2013).

² The IE is being implemented by the Center for Resilience REAL project, which is contracted by the United States Agency for International Development (USAID) to provide monitoring and evaluation support to Feed the Future.

The project seeks to assist not only pastoralists, but also agro-pastoralists, non-pastoralists, and those transitioning between these different categories. Its implementation area covers 54 woredas (districts) within three pastoral clusters (PC) in Ethiopia: the Southern PC, the Somali PC, and the Afar PC (see Figure 1).

The Southern PC includes the Borena/Guji zones of Oromia Region and the Liban Zone of Somali Region. The Somali PC includes the Jijiga and Shinile³ zones of the Somali Region, and the Afar PC is comprised of Zone 3 of the Afar Region.

The project is being implemented by Mercy Corps in partnership with CARE International, Kimetrica, Haramaya University, Action for Integrated Sustainable Development, Ethiopian Center for Disability and Development, Horn of Africa Voluntary Youth Committee, Aged and Children Pastoralists Association, and SOS Sahel Ethiopia. It is a five-year project and expects to benefit 250,000 individuals.

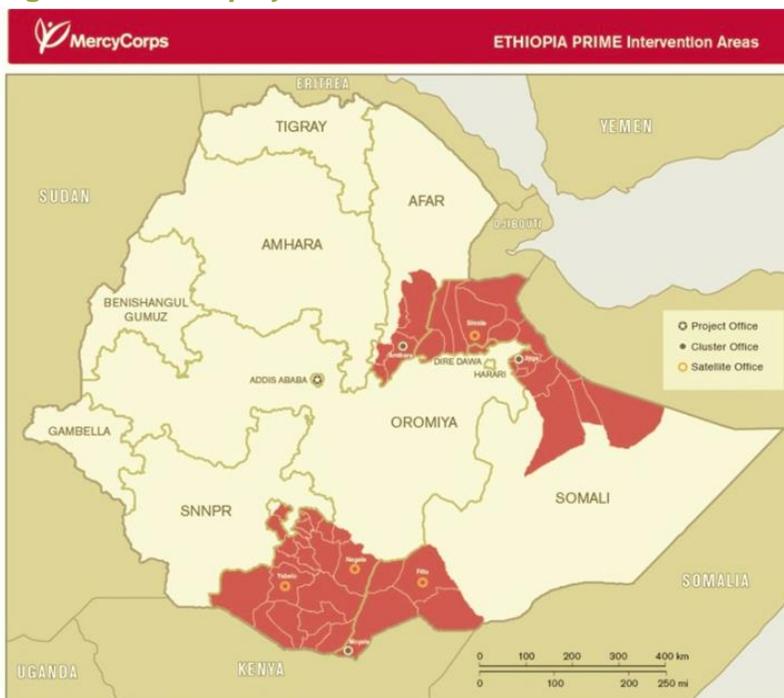
1.2 Description of the PRIME Project IE Areas: Borena and Jijiga

The PRIME IE is being undertaken in a sub-set of the project's overall implementation area comprising two zones: Borena and Jijiga. Borena is located in the southern lowlands of Ethiopia, bordering on northern Kenya. It is one of 17 zones within the region of Oromiya. Jijiga, also known as "Fafan," borders Somalia (the country) and is located in the northern part of the Somali region. Both areas have arid and semi-arid climates and are situated in the drylands of Ethiopia, where pastoralism has traditionally prevailed. They are characterized by erratic and unpredictable rainfall and patchy vegetation.⁴ The scope for sedentary, arable farming is limited in many parts of these zones. Nomadic and semi-nomadic pastoralists have traditionally made efficient use of scarce natural resources to access food and earn income through the sale and consumption of livestock and livestock products (meat, milk, and hides).

³ The Jijiga zone is now called Fafan.

⁴ This overview of the PRIME project area is summarized from Mercy Corps (No date).

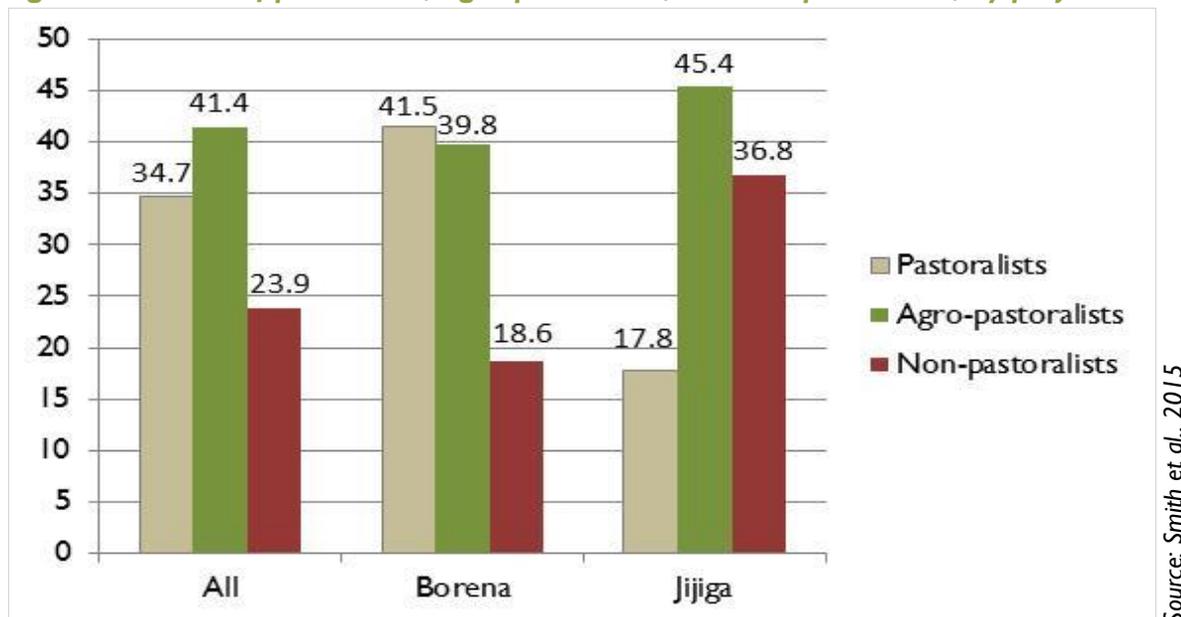
Figure 1: PRIME project intervention areas



A sustainable balance of human populations, livestock populations, water, and rangeland resources are required for pastoralism to thrive over the long term. However, in Borena and Jijiga, as in pastoral areas across Ethiopia, pastoral systems are under increasing pressures due to natural and man-made shocks that are leading to imbalances between these populations and the resources they depend on to sustain themselves. Ongoing climate change is expected to increase the unpredictability of rainfall, leading to more frequent droughts and floods. A diminishing natural resource base due to overgrazing, increased sedentarization, and the increased presence of agriculture⁵ has reduced pastoralists' mobility. Yet mobility is a key foundation of traditional risk management strategies, and its reduction has made them increasingly vulnerable to shocks. An additional challenge is that increased competition for pasture and water has led to conflict in a number of places, including locations within the PRIME project's operational area. These pressures have spurred many pastoralists to transition out of pastoralism and seek alternative livelihoods.

Figure 2 shows the percentage of households that were pastoralist, agro-pastoralist, and non-pastoralist in Borena and Jijiga at the time of the PRIME baseline. As can be seen, the transition out of pastoralism is well under way in both areas, being furthest along in Jijiga. Pastoralism is far more prevalent in Borena than Jijiga, and non-pastoralism far more prevalent in Jijiga than Borena. Accordingly, the baseline data show that crop production is much more likely to be households' main source of income and food in Jijiga. The data indicate that poverty and food insecurity are roughly equal across the two areas (Smith et al. 2015).⁶

Figure 2. Percent of pastoralists, agro-pastoralists, and non-pastoralists, by project area



⁵ The increased presence of agriculture manifests itself in increased numbers of commercial farms and in private enclosure.

⁶ When consumption expenditures are used to measure poverty, Borena appears to be poorer. However, a measure of poverty based on asset ownership indicates that Jijiga is poorer. With respect to food security, although calorie consumption is lower in Borena, dietary diversity is higher. Experiential measures of food security point to Jijiga as having somewhat poorer food security than Borena.

1.3 Background on the Recurrent Monitoring Surveys

The PRIME IE was launched with a baseline survey undertaken in Borena and Jijiga in November/December 2013. As noted above, an endline survey will be conducted near the end of the project, and the baseline and endline data will be employed to evaluate the impact of the project on households' resilience in the face of shocks, on household incomes and food security, and on children's nutritional status.

The two recurrent monitoring surveys (RMSs) implemented in the interim between the baseline and endline were planned in order to capture real-time household and community responses to any actual shocks that might occur during the implementation of the PRIME project. This innovative feature of the IE would be launched after "trigger indicators"⁷ monitored on the ground reached shock levels. Following, a series of monthly surveys would be administered to a subsample of the 3,142 baseline households to record their shock exposure, shock coping strategies, and food security as the shock progressed.

The first RMS was launched in October 2014 in response to the failure of the 2014 March-May rains in both Borena and Jijiga. The drought cycle included the failure of Borena's second rains as well and the late start of Jijiga's, combined with an unusual aridity. The RMS-1 survey was administered to 400 households in 17 kebeles (communities) once a month over a period of six months, through March 2015, for a total of six rounds.

RMS-2, the subject of this report, was launched one year later in October 2015 in response to the failure of the second rains in both areas, a drought episode that was part of a wider El Niño-induced drought hitting central and northeastern areas of the country. The survey was administered to 400 households in 18 kebeles, this time once every two months over a year's period. Both areas continued to experience unusual rainfall volatility and marked deterioration in soil moisture throughout the RMS-2 data collection period (see Chapter 3).

1.4 Objective of this Report and Research Questions

The overall objective of the data analysis is to understand the severity of the drought and its downstream impacts, how households coped with it, and the roles of three factors in their ability to recover from it: PRIME project interventions, humanitarian assistance, and households' resilience capacities.

⁷ Trigger indicators (e.g., rainfall, pasture conditions, water availability, livestock body conditions, and food price levels) were tracked through on-the-ground monitoring by project staff supplemented with monitoring of rainfall, soil moisture, and vegetation patterns via the African Flood and Drought Monitor and FEWSNET publications.

The specific research questions explored are:

1. How did the severity of the drought evolve over the RMS-2 period? What downstream shocks (e.g., food price changes and conflict) did households experience and, reflecting the complex risk environment of the PRIME area, how did these shocks co-occur?
2. How did households' food security change over the course of the drought? Which types of households were able to maintain or recover their food security, that is, which were resilient to the drought's impacts?
3. What coping strategies did households employ to deal with the drought? How did these change as the drought progressed?
4. Did PRIME project interventions assist households in their recovery from the drought? How did they affect households' coping strategies?
5. What was the role of humanitarian assistance in households' recovery? Did the timing of food aid matter? How did assistance affect households' coping strategies?
6. Did households' baseline resilience capacities help protect them from the drought's negative impacts? Which specific capacities were most protective? How were households' coping strategies affected by their resilience capacities? Is greater resilience capacity associated with lowered reliance on humanitarian assistance?

1.5 Resilience and Resilience Capacity

As resilience and resilience capacity are both key concepts on which this report's analysis is based, it is important to understand what each is and the distinction between them.

The PRIME 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.”⁸ This report focuses on resilience at the household level. From a practical measurement standpoint, it defines resilience as the ability of a household to manage or recover from shocks and stresses and takes into account whether that recovery took place with the use of negative coping strategies that undermine the ability to recover from future 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.

⁸ USAID 2012.

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*).⁹
- *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.

Given their complexity, measuring the resilience capacities requires combining a variety of indicators of the underlying concepts relevant in a particular setting into one overall indicator. The measurement of absorptive, adaptive, and transformative capacity for the PRIME IE is described in Chapter 8.

1.6 Organization of the Report

Chapter 2 of this report presents the RMS-2 data collection and analysis methodologies. Chapter 3 discusses the household shock exposure associated with the drought episode spanning 2015-2016 and lays out the shock exposure measures that are used in the rest of the report. Chapter 4 examines how food security changed over the RMS-2 period, revealing the extent to which households were resilient to the drought, and Chapter 5 addresses the coping strategies they employed to deal with it. The roles played by PRIME project interventions, humanitarian assistance, and households' resilience capacities in recovery from the drought are investigated in Chapters 6 through 8. Finally, Chapter 9 provides conclusions.

⁹ The descriptions in the paragraph of absorptive, adaptive, and transformative capacity are from Frankenberger et al. (2012b).

2. METHODOLOGY

This section outlines the methodology used for collecting the PRIME IE RMS-2 data. It then describes the methods for analyzing both the quantitative and qualitative data collected.

2.1 Data Collection: Quantitative Survey

The RMS-2 data were collected for a panel of households selected from among the 3,142 baseline households so that baseline (pre-drought) information on resilience capacities and household characteristics would be available for analysis. The data were collected in six rounds, roughly two months apart, between October 2015 and November 2016. The drought episode began in July 2015. Thus, the beginning of the data collection marks three months after the onset of the drought, and the end marks 16 months after its onset. The dates of data collection for each round are given in Table 1.

Table 1: RMS-2 rounds: Dates of data collection

Survey round	Start date	End date
Round 1	October 14, 2015	November 18, 2015
Round 2	December 21, 2015	January 22, 2016
Round 3	February 26, 2016	March 24, 2016
Round 4	April 16, 2016	June 14, 2016
Round 5	July 14, 2016	August 4, 2016
Round 6	September 30, 2016	November 10, 2016

The data were collected by Green Professional Services, the same organization that collected the baseline and RMS-1 data. Enumerator and qualitative researcher training took place from October 13-15, 2015 and included a review of the quantitative and qualitative questionnaires, use of the Nexus 7 tablets with which the data were collected, human subjects research training, data checking for quality control, creating backup copies of data, and data archiving and transfer. Trainers included staff members from Green Professional Services and TANGO International.

2.1.1 Sampling Design

In order to facilitate the final impact evaluation of the PRIME project, the baseline sampling design was planned with the need to collect data for two intervention groups—high intensity and low intensity¹⁰—within each of the two PRIME IE areas.

¹⁰ Each of the 112 kebeles in the IE area were assigned to a high or low intensity group. See the baseline report (Smith et al. 2015) for details of this assignment process.

The sample was thus drawn from four strata:

- Borena high intensity (Borena HI);
- Borena low intensity (Borena LI);
- Jijiga high intensity (Jijiga HI); and
- Jijiga low intensity (Jijiga LI).

To ensure a representative sample, sample selection was based on a two-stage, stratified random sampling design. In stage one, sample enumeration areas (EAs)¹¹ were selected within each stratum using probability proportional to size (PPS) sampling. In the second stage, households within each EA were selected randomly from household listings. After the baseline data collection, the number of sample households in Borena available for sampling for RMS data collection was 1,744 and the number in Jijiga was 1,398. These households, located in a total of 139 EAs, make up the sampling frame for the RMSs.

The goal of the RMS-2 sample selection was to ensure a representative sample of at least 400 households from among the baseline sample throughout the monitoring period. Sample selection was based on a stratified random selection of the EAs within the two regions, but without further stratification into high and low intensity groups. All baseline households in each selected EA were included in the sample.¹² In order to ensure the minimum 400 household sample size, and using a ten percent mark-up for nonresponse and five percent mark-up for sample attrition, ten EAs (with a mean of 22.6 baseline households in each) were chosen in each stratum using PPS sampling.

Working with local informants, RMS-2 enumerators were able to locate 96 percent of the 472 baseline households, collecting data from 454 households. After data cleaning, the final number of households included in each round of the RMS-2 analysis sample is 400: 215 in Borena and 185 in Jijiga (see Table 2).

Figure 3 shows the location of Borena within the broader region of Oromiya (see the pink area in the south) as well as sample woredas in the area. Figure 4 shows the same for Jijiga within Somali (see the dark pink area in the north).

¹¹ Enumeration areas are the smallest geographical unit for which population data were collected in the 2007 census, which provided the sample frame for the baseline. There may be several enumeration areas in each kebele.

¹² Note that RMS-1 sampling was based on stratification of the sample into the four original baseline strata, with a half-half split between the low intensity and high intensity groups in each. The sampling weights were adjusted so that all statistics calculated would be representative of the PRIME IE population. The method used here is altered from this design in order to avoid repeat sampling of EAs in the smaller, high intensity strata.

Table 2: The PRIME RMS-2 analysis sample

Project area	Woreda	Number of kebeles	Number of enumeration areas	Number of households
Borena	Yabelo	4	4	88
	Teltele	3	3	66
	Dugdada	1	1	22
	Miyo	2	2	39
Jijiga	Gursum	1	2	42
	Jijiga	1	1	19
	Kebrebe	6	7	124
Total		18	20	400

Sampling weights, the inverse of the selection probability of each household, used in the calculation of all descriptive statistics, were calculated round-by-round to ensure that the resulting statistics are representative of the population in each round. In cases where a statistic is calculated summarizing information across all of the rounds, the mean of the round sample weights is employed.

2.1.2 Quantitative Survey Questionnaire

As in RMS-1, data were collected in each RMS-2 round on the shocks households experienced, the coping strategies they used to deal with the shocks, and indicators of household food security. In RMS-2, additional data were collected on asset ownership and humanitarian assistance. The questionnaire contains the following modules (see Appendix 1):

- Module 1: Household identification cover sheet
- Module 2: Shocks and shock coping strategies
- Module 3: Fodder and water availability
- Module 4: Food insecurity coping strategies
- Module 5: Household dietary diversity
- Module 6: Household hunger
- Module 7: Asset ownership
- Module 8: Humanitarian assistance

Administrative Region, Zone and Woreda Map of Oromia

35°00'E

40°00'E

10°00'N

10°00'S

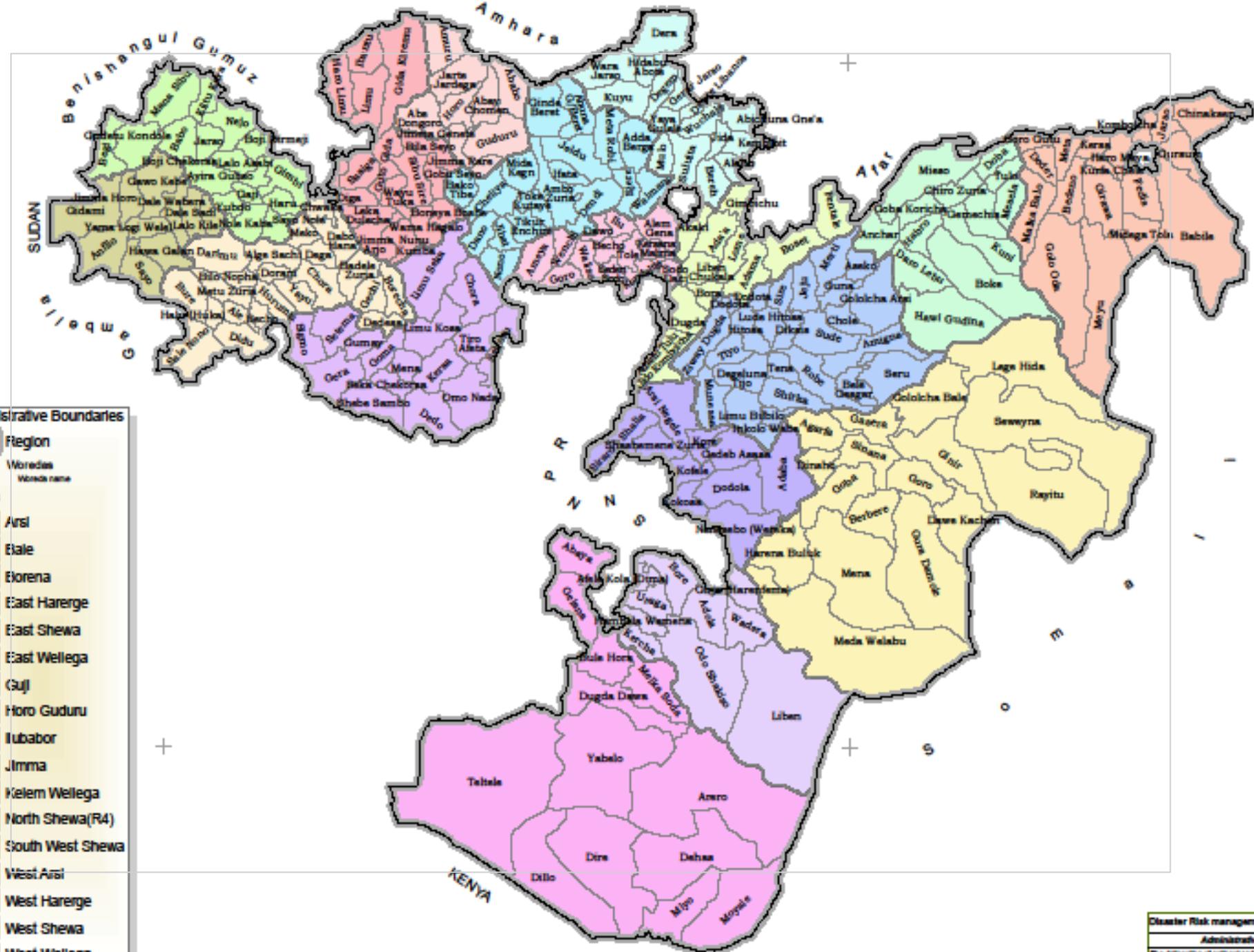


Administrative Boundaries

- Region
- Woredas
Woreda name

Zones

- Arsi
- Bale
- Eforena
- East Harerge
- East Shewa
- East Wellega
- Guji
- Horo Guduru
- Jubabor
- Jimma
- Kelem Wellega
- North Shewa(R4)
- South West Shewa
- West Arsi
- West Harerge
- West Shewa
- West Wellega

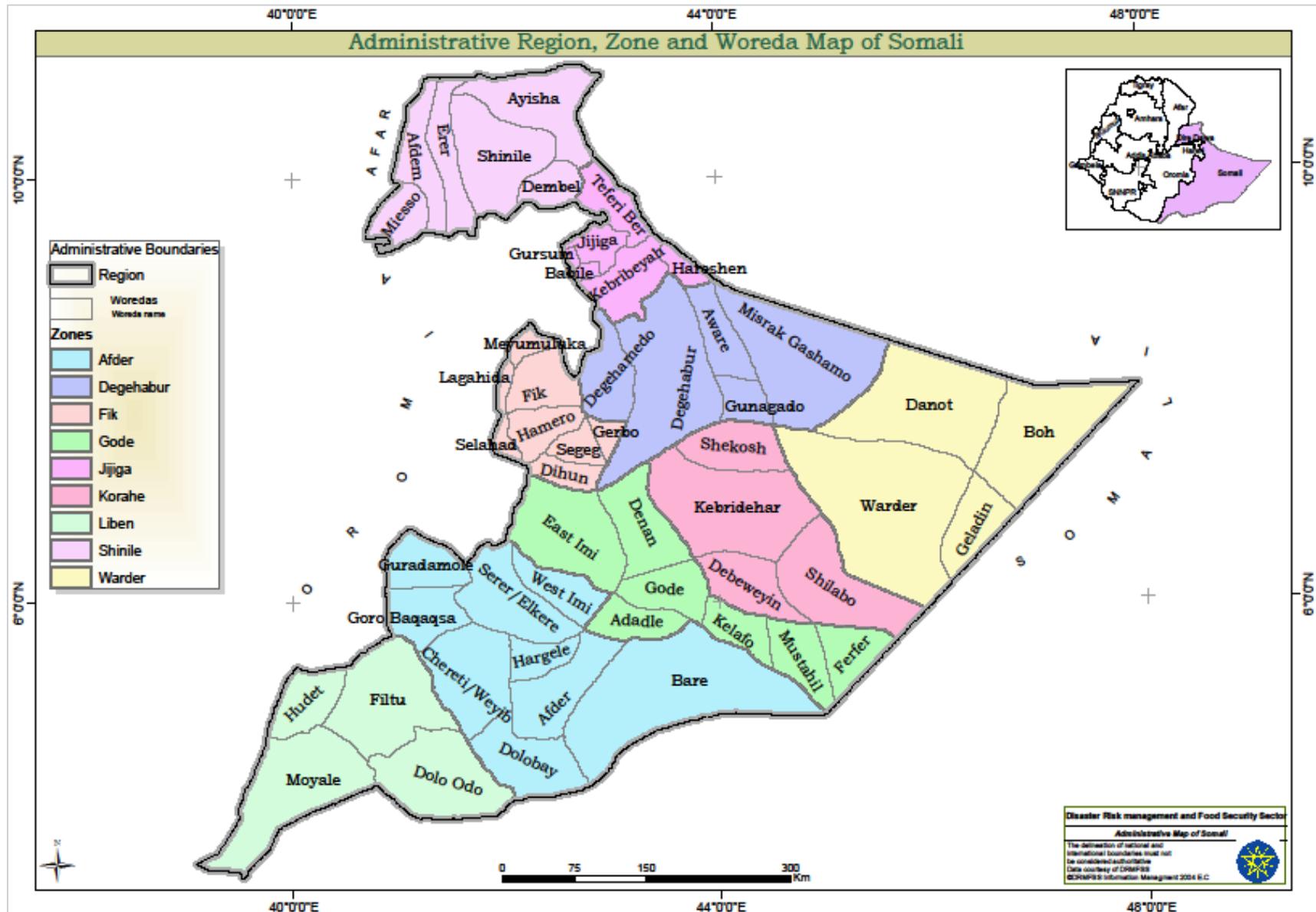


35°00'E

40°00'E

Disaster Risk management and Food Security
Administrative Map of Oromia
 The delineation of national and international boundaries must not be considered authoritative
 Data courtesy of CIA/PRF
 ©2011/PRF Information Management 2011 E.C.

Figure 4: Location of Jijiga within Somali region



2.2 Data Collection: Qualitative Survey

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 the study, provide an understanding of local concepts and definitions of resilience, and enable a better understanding of the significance of changes that are measured quantitatively as perceived by households.

Qualitative data were collected in kebeles to determine how communities were coping with the 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. Another objective of the qualitative interviews was to determine gender-differentiated impacts of shocks. The fact that the 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 quantitative teams and conducted focus group discussions (FGDs) or key informant interviews (KIIs) in selected sample kebeles (see topical outlines in Appendix 2). Each team had a female and a male interviewer (usually the supervisor). Separate FGDs were held for men and women, and attendance ranged from five to six people. To address interview fatigue, every other round alternated between focus groups and key informant interviews. Key informant interviews were conducted in Round 1, 3, and 5. Focus group interviews were conducted with male and female groups in round 2, 4, and 6. Approximately 2-3 female focus groups and 3-4 male focus groups were conducted in every round that focus group information was gathered across 5-6 kebeles. In the rounds when key informant information was collected 5 key informants were interviewed across 5 kebeles on average. A total of 8 female focus groups and 9 male focus groups were interviewed in Jijiga with a total of 45 women and 59 men participating. In Borena, 9 female focus groups and 9 male focus groups were interviewed with of total of 53 women and 50 men participating. In terms of key informant interviews, 15 people were interviewed in Jijiga and 14 in Borena. The types of key informants included kebele chairpersons, kebele administration managers, community elders and village leaders, a development agent and one security official.

2.3 Analysis of the Quantitative Data

The quantitative data analysis was conducted in STATA using both descriptive and multivariate regression techniques.

2.3.1 Descriptive Analysis

The RMS-2, baseline and, in some cases, RMS-1 household survey data are used to conduct descriptive analysis of indicators describing households' shock exposure (Chapter 3), food security and resilience (Chapter 4), and coping strategies (Chapter 5). Indicator values are reported as percentages and means. They are reported over time and, additionally, by three key population subgroups:

- PRIME IE region: Borena or Jijiga;
- Pastoralist status: Pastoralist, agro-pastoralist or non-pastoralist;¹³
- Resilience positive deviance: resilience positive deviant or non-positive deviant.

Resilience positive deviants are households that fared far better than average over the course of the drought. They are identified using the change in food security over the six RMS-2 rounds as the marker of how households fared (see Chapter 4).

As noted above, representativeness of the PRIME IE area is maintained by weighting any statistics that apply to the survey population as a whole by survey sampling weights.

2.3.2 Multivariate Regression Analysis

In Chapters 6 through 8 of this report, multivariate regression analysis is used to investigate Research Questions (4), (5), and (6), restated here:

(4) Did PRIME project interventions assist households in their recovery from the drought? How did they affect households' coping strategies?

(5) What was the role of humanitarian assistance in households' recovery? Did the timing of food aid matter? How did assistance affect households' coping strategies?

(6) Did households' baseline resilience capacities help protect them from the drought's negative impacts? Which specific capacities were most protective? How were households' coping strategies

¹³ Baseline data on self-reports of the main sources of households' food and income in the last year, along with rankings of these sources in terms of the proportion of food/income they provide, are used to classify households into the pastoralist status groups. The groups are defined as follows:

Pastoralist: Livestock production and sales is the primary livelihood activity;

Agro-pastoralist: Crop production and sales is the primary livelihood activity. Livestock production and sales is also a livelihood activity; and

Non-pastoralist: Livestock production and sales is not a source of food or income. Also included in this category are households for which livestock production and sales is declared as a livelihood activity, but the primary source of food and income is wage labor, self-employment unrelated to crop or livestock production, remittances, gifts or inheritances, or assistance from friends, neighbors or relatives or from an outside organization.

affected by their resilience capacities? Is greater resilience capacity associated with lowered reliance on humanitarian assistance?

These questions ask which of three factors—PRIME project interventions, humanitarian assistance, and initial resilience capacities—hypothesized to increase households’ resilience to the drought actually did so, in addition to how they affected households’ coping strategies. They are addressed in this report employing standard growth regression (e.g., Yamano et al. 2015; Hoddinott and Kinsey 2001) and probit regression for discrete dependent variables (Green 2012).

Resilience to the drought: Standard growth regression model

Households’ ability to recover from the drought, or degree of “resilience” (denoted R), is measured using changes in food security (Y) over time. In addition to the three factors of main interest here, the change for household “i” over the six RMS-2 rounds ($Y_{i,R6} - Y_{i,R1}$, $i=1\dots n$) is hypothesized to be influenced by:

- Cumulative shock exposure over the period ($SE_{i,R1-R6}$);
- Initial food security ($Y_{i,R1}$), which is expected to be negatively associated with the change in food security;
- Household characteristics, as measured prior to the drought period (X_i); and
- Region of residence (Borena or Jijiga).

To address research question (4), the relationship between PRIME interventions and households’ recovery from the drought, the empirical specification is:

$$Y_{i,R6} - Y_{i,R1} = \alpha + \beta_1 PI_i + \beta_2 SE_{i,R1-R6} + \beta_3 Y_{i,R1} + \beta_4 X_i + \beta_5 Borena + \varepsilon_i, \quad (1)$$

where α and the β s are coefficients to be estimated, PI is a dummy variable indicating whether the household resides in a PRIME “high intensity” kebele, β_1 is the estimate of the association between ability to recover and PRIME interventions, and ε_i is an error term. The PRIME project intervention arms—high intensity and low intensity—represent the extent of exposure of households to the full set of PRIME interventions. They were chosen purposefully prior to the project’s implementation in order to conduct the quantitative impact evaluation. Shock exposure is measured using the cumulative rainfall deficit over the drought episode (see Chapter 6 for details).

The household characteristics, X_i , included as independent variables are:

- Number of household members;
- 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, that is, there are no adult male household members;
- Pastoralist status (dummy variables for pastoralist, agro-pastoralist and non-pastoralist); and
- An asset index based on RMS-2 Round 1 ownership of three categories of assets: consumer durables, agricultural productive assets, and livestock (see Chapter 4).

Resilience marks the ability of households to withstand and recover from shocks, to maintain their well-being even in the face of shocks. To focus in more specifically on whether PRIME interventions worked to protect households from the negative impacts of the shock they experienced, a regression is run that includes an interaction term between the shock exposure measure and the PRIME intervention arm indicator, as follows:

$$Y_{i,R6} - Y_{i,R1} = \alpha + \beta_1 PI_i + \beta_2 SE_{i,R1,R6} + \beta_3 PI * SE_{i,R1,R6} + \beta_4 Y_{i,R1} + \beta_5 X_i + \beta_6 Borena + \varepsilon_i. \quad (2)$$

A coefficient on the interaction term (β_3) that is statistically significant and positive indicates that this protective pathway was in action.

As will be seen in Chapter 6, the growth regression analysis for PRIME project interventions indicates that they have fundamentally altered households' resilience to drought for the better. For this reason, when investigating the effects of the second two hypothesized factors affecting households' ability to recover—humanitarian assistance and baseline resilience capacities—the PRIME intervention arm indicator “PI” and its interaction term with the shock exposure indicator are included as independent variables. The empirical specification for investigating the relationship between humanitarian assistance (HA) and households' ability to recover is thus:

$$Y_{i,R6} - Y_{i,R1} = \alpha + \beta_1 HA_i + \beta_2 PI_i + \beta_3 SE_{i,R1,R6} + \beta_4 PI * SE_{i,R1,R6} + \beta_5 Y_{i,R1} + \beta_6 X_i + \beta_7 Borena + \varepsilon_i. \quad (3)$$

Humanitarian assistance is examined separately for the three types of assistance most commonly received over the drought period: food aid, cash assistance, and food/cash-for-work (see Chapter 7). Similarly, the empirical specification for investigating the relationship between households' baseline resilience capacities (RC) and households' ability to recover is:

$$Y_{i,R6} - Y_{i,R1} = \alpha + \beta_1 RC_i + \beta_2 PI_i + \beta_3 SE_{i,R1,R6} + \beta_4 PI * SE_{i,R1,R6} + \beta_5 Y_{i,R1} + \beta_6 X_i + \beta_7 Borena + \varepsilon_i. \quad (4)$$

This equation is run for various measures of resilience capacity, including indexes of the three dimensions of resilience capacity and twenty-two specific capacities.

Finally, the equations including interaction terms between shock exposure and humanitarian assistance, and between shock exposure and the resilience capacity indicators, respectively, are:

$$Y_{i,R6} - Y_{i,R1} = \alpha + \beta_1 HA_i + \beta_2 PI_i + \beta_3 SE_{i,R1,R6} + \beta_4 HA * SE_{i,R1,R6} + \beta_5 PI * SE_{i,R1,R6} + \beta_6 Y_{i,R1} + \beta_7 X_i + \beta_8 Borena + \varepsilon_i. \quad (5)$$

$$Y_{i,R6} - Y_{i,R1} = \alpha + \beta_1 RC_i + \beta_2 PI_i + \beta_3 SE_{i,R1,R6} + \beta_4 RC * SE_{i,R1,R6} + \beta_5 PI * SE_{i,R1,R6} + \beta_6 Y_{i,R1} + \beta_7 X_i + \beta_8 Borena + \varepsilon_i. \quad (6)$$

Resilience to the drought: probit positive deviance analysis

As mentioned above, resilience positive deviants (PD) are households whose overall change in food security over the course of the drought was particularly high. The strategy for investigating how the three hypothesized factors affected whether or not a household was a PD follows that presented above for the growth regressions. The basic equations, estimated by fitting a maximum likelihood probit model, for PRIME interventions, humanitarian assistance, and households' resilience capacities, respectively, are:

$$PD_i = \alpha + \beta_1 PI_i + \beta_2 SE_{i,R1,R6} + \beta_3 Y_{i,R1} + \beta_4 X_i + \beta_5 Borena + \varepsilon_i \quad (7)$$

$$PD_i = \alpha + \beta_1 HA_i + \beta_2 PI_i + \beta_3 SE_{i,R1,R6} + \beta_4 PI * SE_{i,R1,R6} + \beta_5 Y_{i,R1} + \beta_6 X_i + \beta_7 Borena + \varepsilon_i \quad (8)$$

$$PD_i = \alpha + \beta_1 RC_i + \beta_2 PI_i + \beta_3 SE_{i,R1,R6} + \beta_4 PI * SE_{i,R1,R6} + \beta_5 Y_{i,R1} + \beta_6 X_i + \beta_7 Borena + \varepsilon_i, \quad (9)$$

where PD is a dummy variable equal to one if the household is a resilience positive deviant and zero otherwise. The equations with interaction terms between shock exposure and the hypothesized factors affecting households' recovery parallel Equations (2), (5), and (6) above. The reason that initial food security is included in these regression models is because the identification of PDs is strongly influenced by initial food security (households with low food security have more room for improvement—moving up the food security scale—at the outset than those with high food security, especially those already reaching maximum levels in the latter group); not controlling for it could bias the coefficients of the other independent variables.

Coping strategies: probit analysis of round-stacked data set

Coping strategies data were collected in all six rounds of the RMS-2 data collection. To take full advantage of this rich data on household behavior related to the drought, a “round-stacked” data set was created whereby individual observations are for each household and each round of data collection, yielding a potential of 2,400 observations for each coping strategy. The empirical strategy for investigating how the three hypothesized factors affected whether or not a household employed a particular coping strategy follows that presented above for the growth regressions with the following modifications: shock exposure and asset ownership are specific to each household and round, initial food security is not included, and dummy variables for the round of data collection are included as independent variables, yielding a “round fixed-effect” model.¹⁴

The basic equations, estimated by fitting a maximum likelihood probit model, for PRIME interventions, humanitarian assistance, and households' resilience capacities, respectively, are:

$$CS_{it} = \alpha + \beta_1 PI_i + \beta_2 SE_{it} + \beta_3 X'_i + \beta_4 W_{it} + \beta_5 Borena + \mu_t + \varepsilon_i \quad (10)$$

$$CS_{it} = \alpha + \beta_1 HA_{it} + \beta_2 PI_i + \beta_3 SE_{it} + \beta_4 PI * SE_{it} + \beta_5 X'_i + \beta_6 W_{it} + \beta_7 Borena + \mu_t + \varepsilon_i \quad (11)$$

¹⁴ It is not possible to control for the household each observation refers to (making the model a “household fixed-effects” model) because many of the independent variables controlled for do not vary across rounds.

$$CS_{it} = \alpha + \beta_1 RC_i + \beta_2 PI_i + \beta_3 SE_{it} + \beta_4 PI * SE_{it} + \beta_5 X'_i + \beta_6 W_{it} + \beta_7 Borena + \mu_t + \varepsilon_i. \quad (12)$$

In Equations (10) through (12), X'_i is a vector of household characteristics excluding assets, W_{it} is the round-specific index of asset ownership, and μ_t is a vector of round dummy variables. Note that the indicators for receipts of humanitarian assistance are round-specific (see Equation 11). Equation (12) for the resilience capacities is run for a total of 12 coping strategies and 22 resilience capacities, that is, for a total of 264 regressions.

A note on causality

Given the nature of the data collected, the regression techniques used to analyze the data do not allow analysis of causal impacts of the three hypothesized factors on households' ability to recover from the drought and their coping strategies. Specifically for the case of PRIME interventions and humanitarian assistance, standard growth regression and probit regression in the form 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.¹⁵ For these two factors, we take care to understand the direction of any such bias by comparing the baseline well-being, shock exposure, economic status, resilience capacities, and demographic characteristics of households across intervention groups before proceeding with the regression analysis.

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 (as identified by the signs of regression coefficients) are in the expected, hypothesized directions and deemed to be statistically significant, while controlling for other factors known to influence the dependent variables. While we cannot claim to provide accurate estimates of the magnitude of effect of the hypothesized factors, the data do allow us to reasonably identify whether or not they play a role.

2.4 Analysis of the Qualitative Data

The qualitative information from the FGDs and KIs were transferred into topically-structured matrices. The 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, social or economic status, and ethnic group.

Specific research questions guiding the qualitative analysis are:

1. What kind of shocks and stresses is the community experiencing?
2. How are the shocks/stresses affecting the entire community? Household livelihoods?

¹⁵ 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).

3. Who within the community is most affected by the shocks/stresses (e.g., women, children, elderly, etc.)? How?
4. What actions are members of the community taking to support each other to respond to the shock?
5. How is the shock affecting relationships within the community? Has that changed as a result of the shocks/stresses experienced? How? Why?
6. How is the shock affecting relationships with other communities? Has that changed as a result of the shocks/stresses experienced? How? Why?
7. Are community leaders effective at organizing support for all members of the community? Why or why not?
8. What collective action is the community taking to protect or maintain resources important to the whole community? Which resources and why?



Photo credit: Sean Sheridan for Mercy Corps

3. HOUSEHOLD SHOCK EXPOSURE

This chapter starts by describing how drought conditions in the two IE areas, Borena and Jijiga, evolved over the RMS-2 period, from October 2015 to November 2016. To do so, it relies on two secondary sources of information: (1) Famine Early Warning Systems Network (FEWS NET) publications; and (2) Africa Flood and Drought Monitor (AFDM) satellite remote sensing data. It then presents RMS-2 quantitative and qualitative data on households' own reports of their exposure to the drought and other shocks. After examining patterns of correlations across the shocks households experienced, it ends by presenting summary measures of shock exposure and comparing them across the project areas and pastoral status groups.

With respect to the secondary sources of information, the FEWS NET publications are Food Security Outlook and Food Security Outlook Updates published from July 2015 through April 2017. The information in these publications is from local observers, market reports, and remote sensing data on evolving drought conditions. The AFDM is a real-time drought monitoring and seasonal forecast system for sub-Saharan Africa developed through a collaboration of the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the International Hydrological Programme. Current conditions are compared to an historical, multi-decadal reconstruction of the terrestrial water cycle using data from 1950-2008. For this report, data on measures of rainfall, vegetation coverage, and soil moisture comparing the current situation with the historical record are employed. The measures are the (1) Standardized Precipitation Index (SPI); (2) Normalized Difference Vegetation Index (NDVI) percentile; and (3) Soil moisture percentile. The AFDM's internet interface allows Geographical Information System (GIS) coordinates to be employed to access data for localized geographical areas with 0.25o spatial resolution (Sheffield et. al. 2014). For this analysis, month-by-month AFDM data are downloaded using GIS coordinates for each of the 18 sample kebeles.

3.1 The Context: Evolution of the Drought

Table 3 shows the normal rainfall calendar in the IE areas in relation to the six rounds of the RMS-2 data collection. Both areas have a bi-modal rainfall pattern with spring rains (Ganna in Borena, Diraa in Jijiga) occurring in the earlier part of the year and autumn rains (Hagaya and Karan) in the latter months. The RMS-2 data collection began near the end of the 2015 autumn rains, continued through the 2016 spring rains, and concluded near the end of the 2016 autumn rains, thus spanning three rainy seasons.

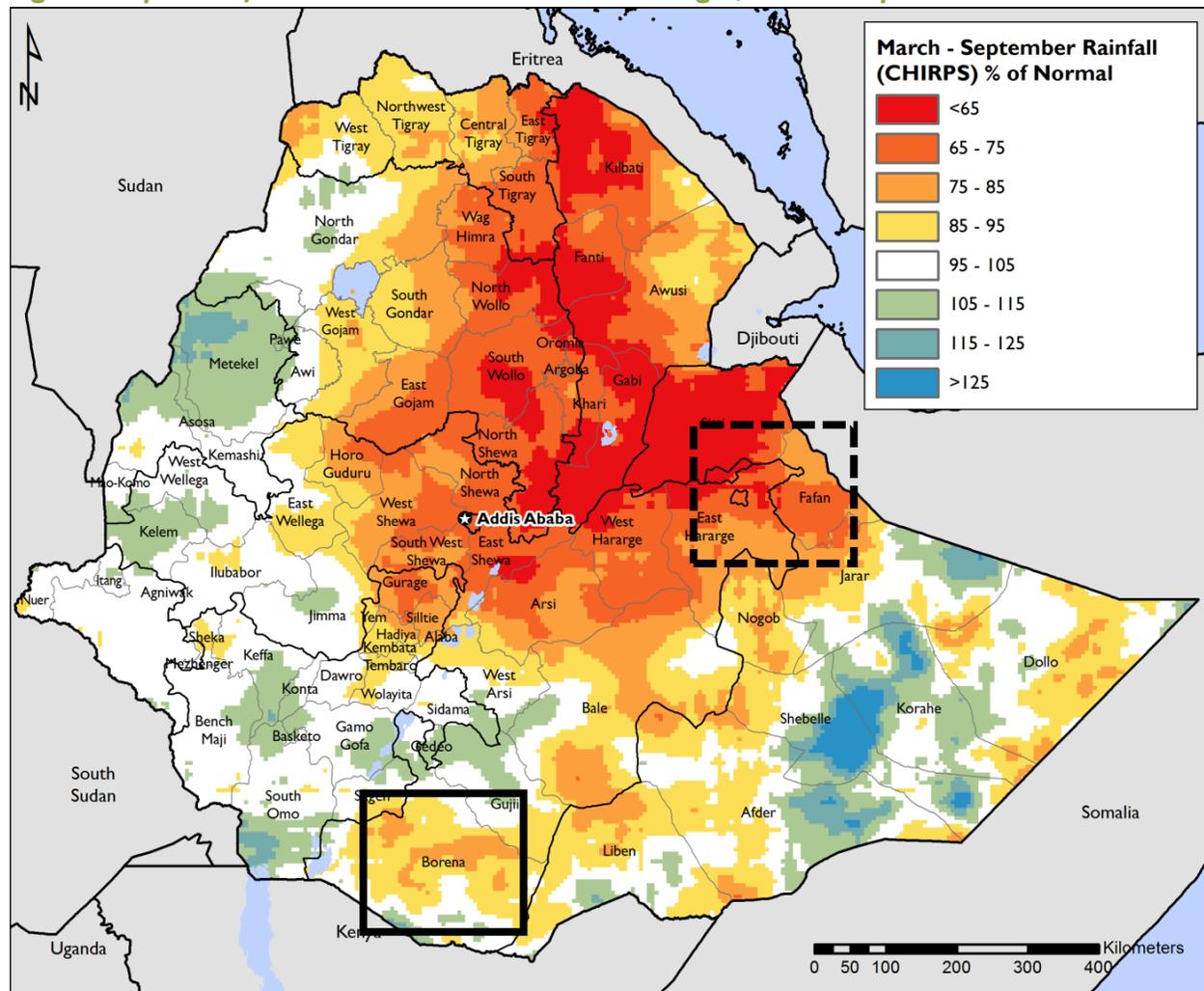
The drought that triggered the implementation of RMS-2 started with an unusually arid period centered on the central and northeastern areas of the country that was considered to be Ethiopia's "worst drought in more than 50 years" (FEWS NET 2016a); it led the government to classify over one-third of woredas country-wide as facing a dire food security and nutrition crisis (OCHA 2017). The drought is referred to as the "2015/16 El Niño drought" because it was induced by the El Niño Southern Oscillation (ENSO) (Government of Ethiopia and OCHA 2017; FEWS NET 2017d). Figure 5 shows its geographical spread from March through September 2015 in relation to the IE areas.

Table 3: Rainy seasons in Borena and Jijiga in relation to the RMS-2 data collection

2015		2016																
		R1		R2		R3		R4			R5		R6					
		August	September	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December
Borena		Hagaya rains								Ganna rains					Hagaya rains			
Jijiga		Karan rains								Diraa rains				Karan rains				

Sources: SCI, FAO, UNICEF, FAO, and WFP. 2012; Jijiga: Somali region: Multi-Agency DEYRII/KARAN 2012 seasonal assessment report; Borena: FEWS NET.

Figure 5: Spread of the 2015/16 El Niño-induced drought, March-September 2015



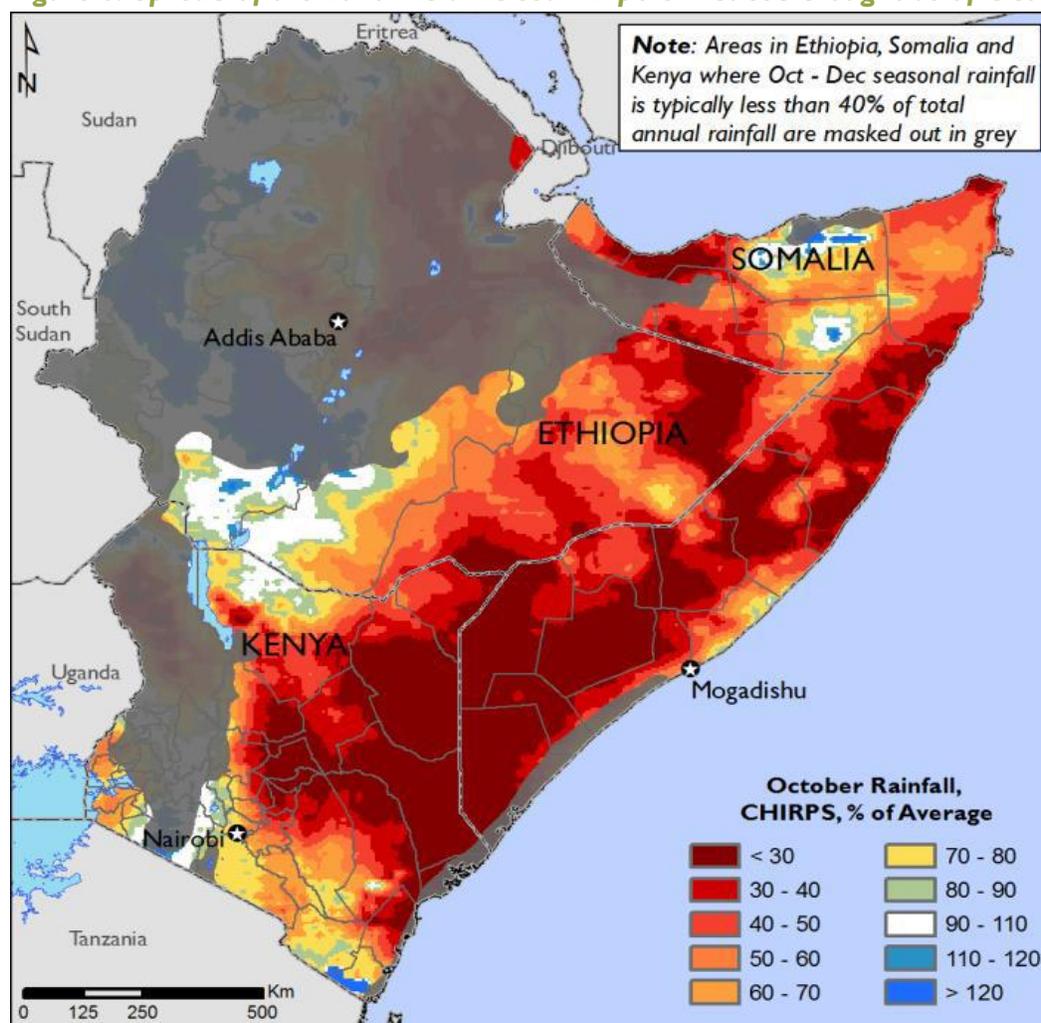
Source: FEWS NET (2015)

Note: The dashed-line black square indicates Jijiga, the solid black square indicates Borena.

Later in the RMS-2 period, starting in mid-2016, a second drought set in that spread across the East Africa region. This drought was induced by another weather phenomenon related to ocean water temperatures, the (negative) Indian Ocean Dipole (IOD) (UNICEF 2017; Ferrie 2017). Its geographical spread as of October 2016, the time of the autumn rains, is shown in Figure 6.

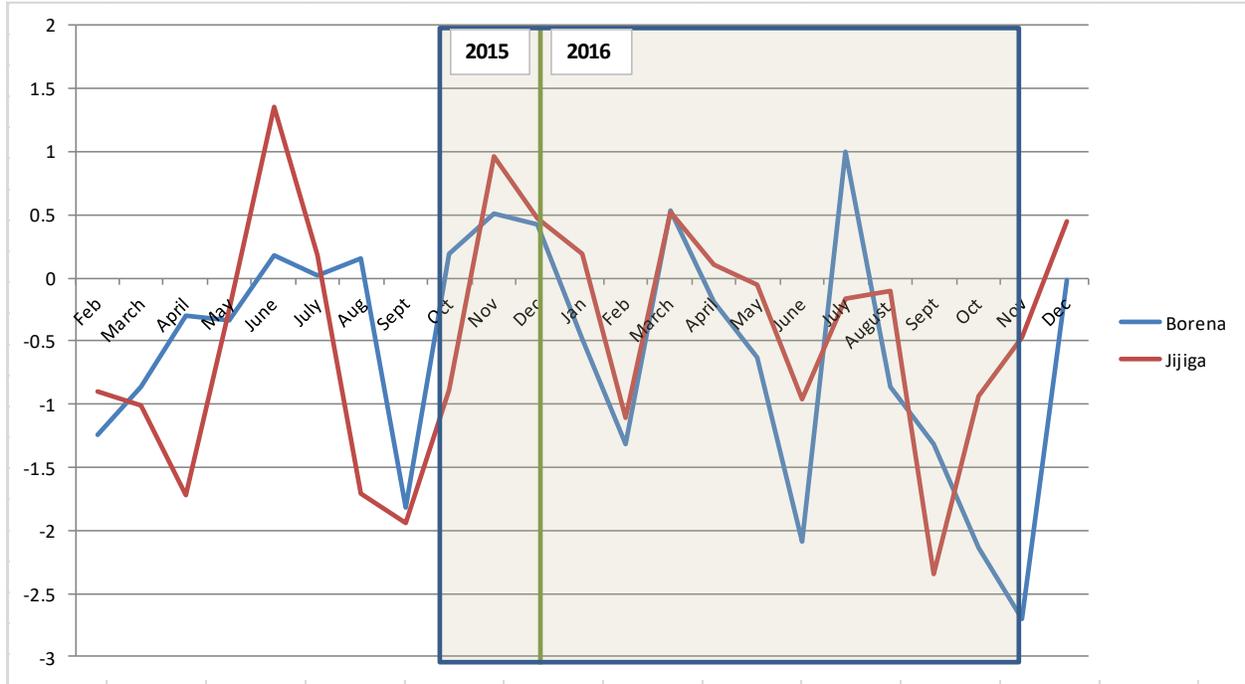
Thus, the RMS-2 period witnessed an extended period of drought marked by three back-to-back failed rainy seasons. The severity of the drought is related to climate change. According to Marchant (2017) of the Institute for Tropical Ecosystems, global warming has made weather phenomena like the El Niño and IOD more extreme.

Figure 6: Spread of the 2016 Indian Ocean Dipole-induced drought as of October 2016



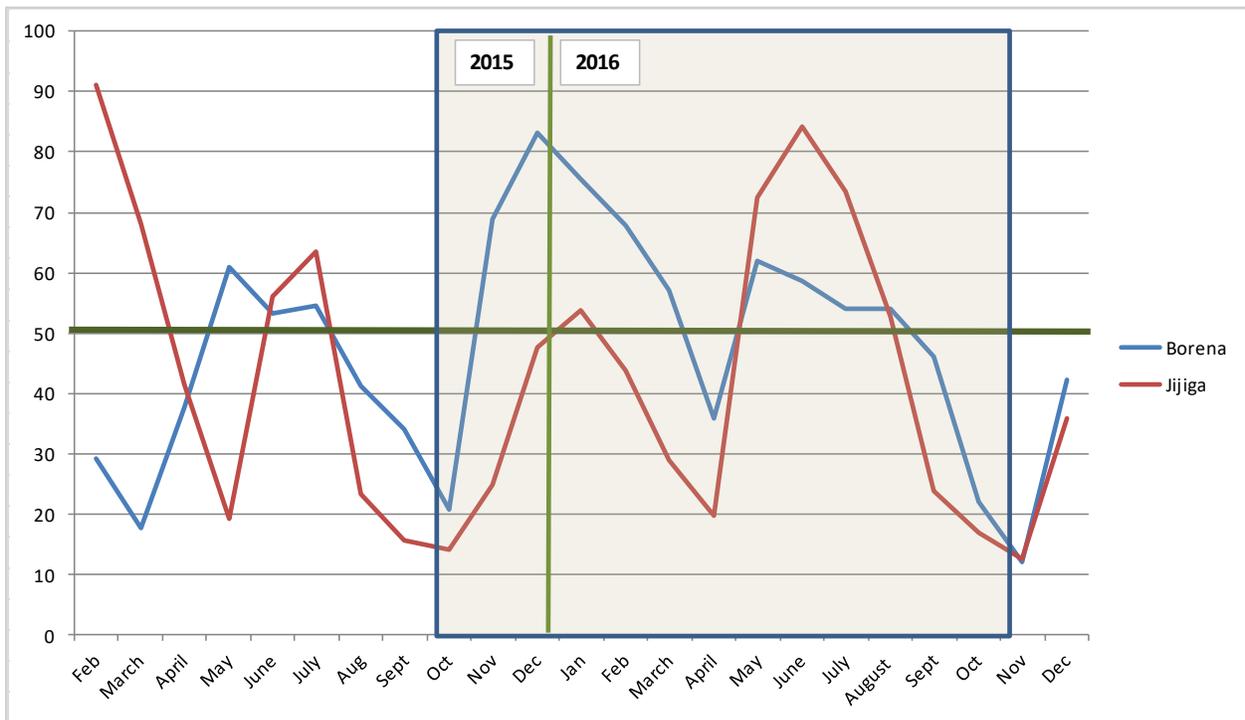
While Borena is located relatively far from the 2015/16 El Niño drought center (Figure 5), AFDM satellite data reveal that it nevertheless experienced severe drought over the RMS-2 period. Figure 7-Figure 9 document rainfall, vegetation, and soil moisture deviations from the norm for Borena and Jijiga kebeles. Borena’s 2015 autumn rains, 2016 spring rains, and 2016 autumn rains were marked by progressively deeper dips in rainfall below the norm with consequent dips in vegetation coverage. Soil moisture, already below normal due to an extended period of rainfall instability starting in early 2013, plummeted to very low levels starting in November 2015 (Figure 9).

Figure 7: Rainfall deviation from norm in Borena and Jijiga, Jan. 2015-Dec. 2016

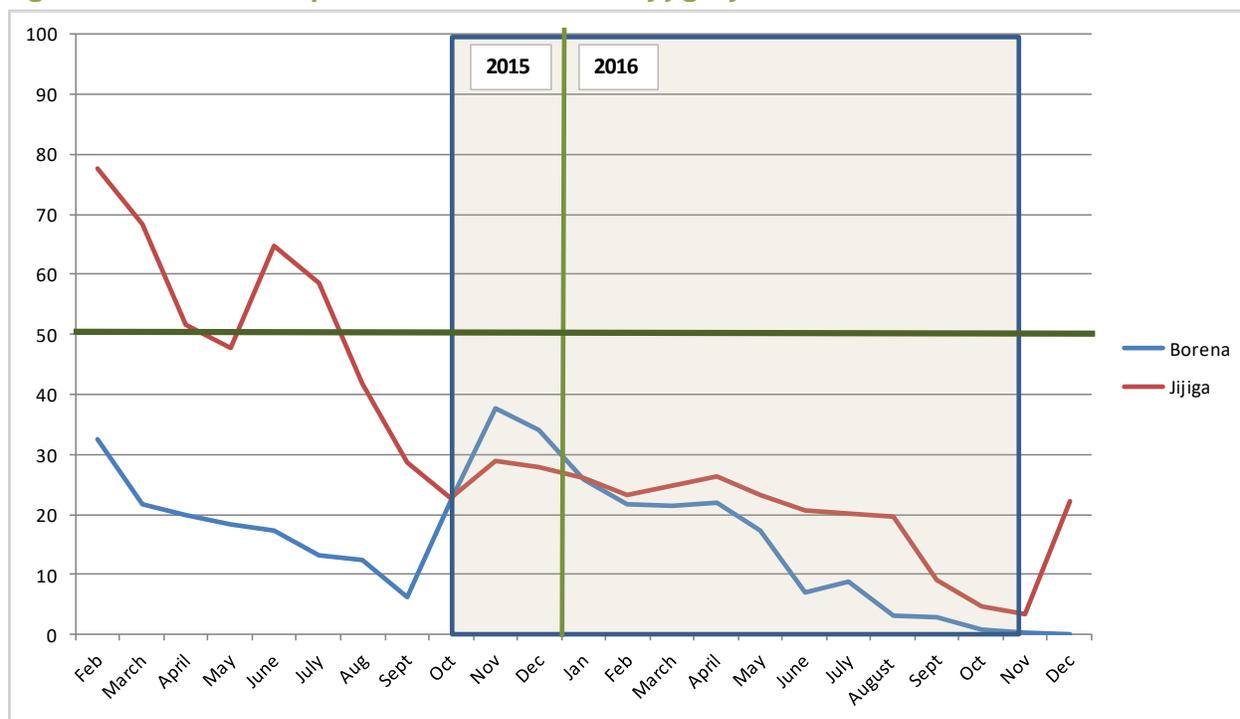


Note: The shaded area marks the RMS-2 period.

Figure 8: Normalized difference vegetation index percentile in Borena and Jijiga, Jan. 2015-Dec. 2016



Note: The shaded area marks the RMS-2 period.

Figure 9: Soil moisture percentile in Borena and Jijiga, Jan. 2015-Dec. 2016

Note: The shaded area marks the RMS-2 period.

While the Jijiga IE area is located closer to the El Niño drought center (Figure 5), according to the AFDM data it nevertheless experienced somewhat less severe drought conditions than Borena over the RMS-2 period (Figure 7 and Figure 8). This is because, while Jijiga's 2015 and 2016 autumn rains were well below normal (with subsequent drops in vegetation coverage), its 2016 spring rains were near normal, bringing a temporary reprieve from dry conditions on the ground. Although Jijiga started 2015 with much better soil moisture than Borena, by the start of the RMS-2 data collection its soil moisture percentile had dropped to the same low level as in Borena (Figure 9). It progressively deteriorated thereafter.

These severe drought conditions were a major shock to livestock and agricultural production in the IE areas. By the end of 2016, FEWS NET (2016b, 2017b) was reporting that due to lack of pasture and water, livestock body conditions and productivity (meat and milk production) were deteriorating, and livestock deaths were occurring in large numbers. The Borena Zone Office of Agriculture and Livestock estimates that between September 2016 and February 2017 a total of 13,873 cattle and 16,646 shoats had died and was reporting increased cases of livestock disease among those migrating to areas with greater water supplies. As a consequence of such stress to livestock rearing, the livestock-to-cereals terms of trade was below average, resulting in below-average purchasing power for pastoral households. In some areas, pastoralists were taking desperate measures to save adult female livestock including slaughtering calves, kids, and lambs to save adult females. Data showing that crop production experienced similarly severe disruption will be presented in the next section.

By the end of 2016, signs that drought conditions were having consequences for households' food security and nutrition were appearing. In February 2017, FEWS NET reported that malnutrition among children and pregnant and lactating women had become a "serious concern" (FEWS NET 2017b). Between September 2016 and January 2017 there was a 147 percent increase in admissions to therapeutic feeding programs of children under five in the Borena region as a whole (FEWS NET 2017c).

How does the RMS-2 drought episode compare with that of RMS-1 (March 2014-March 2015)? With the exception of the 2015 autumn rains in Borena (whose deficit was similar to 2014), all of the rains were further below average in the El Niño/IOD drought episode. Thus, from the point of view of the direct climate shock, **the RMS-2 drought episode was more severe than the drought episode of RMS-1**. In the next section, we look at a fuller set of shocks households reported experiencing, including downstream drought impacts.

3.2 Household Reports of Drought and Its Downstream Impacts

3.2.1 Direct Exposure to the Drought

Table 4 reports on the percentage of households in the IE areas experiencing drought-related shocks over the entire 12-month RMS-2 period and by round, the latter with two-month recall.¹⁶ All households reported being exposed to drought or "too little rain" at some time, with fluctuations in the percentage across rounds. These data corroborate FEWS NET reports and AFDM satellite data showing that both areas experienced repeated episodes of below-normal rainfall over the period.

Qualitative insights from focus groups in all kebeles in Jijiga and Borena support the quantitative data. Drought was reported as the predominant shock, which participants described as including low or erratic rainfall. In Jijiga, most kebeles indicated that the last two years had been particularly difficult in terms of drought. By Round 2, male FGD participants indicated the timing of the autumn rains known locally as "*degahayale*" had been bad and that it had only rained once in the 10 months prior to January 2016. Focus group participants felt the drought also contributed to a number of negative downstream effects. In Borena, FGs felt that drought was becoming a regular occurrence, nearly annual, and lasting at times more than five months. Flooding during the rainy season was also problematic, at least in certain areas of Borena, and livestock disease and death, crop pests, and crop failure were also widely reported.

¹⁶ The shocks listed in the table are denoted "drought-related" shocks in that they are either drought itself ("too little rain") or typical downstream impacts of drought in the Ethiopian context culled from previous studies. Note that data were also collected on two other types of shocks that are not immediately related to the drought conditions households faced over the RMS2 period and thus not reported on here: excessive rains and landslides/erosion.

Table 4: Percent of households experiencing drought-related shocks over the RMS-2 period, by project area

	Any time over RMS-2	RMS-2 rounds (Two-month recall)					
		1	2	3	4	5	6
Borena							
Drought (too little rain)	100	94.5	2.7	65.7	46.3	58.2	83.0
Agricultural production & livestock rearing c/							
Very bad harvest	88.7	22.1	36.3	7.7	10.5	72.2	12.5
Crop disease	70.9	23.7	51.5	1.1	10.2	25.3	0.5
Insufficient fodder for livestock	100	97.7	49.6	98.3	94.3	91.4	98.8
Insufficient water for livestock	92.9	67.0	30.3	61.9	22.4	47.7	58.1
Livestock disease	98.9	66.6	61.5	57.9	50.8	56.2	63.2
Livestock emaciation b/	93.2	77.2	26.4	59.0	47.9	35.8	70.1
Unplanned livestock deaths							
Cattle		10.6	8.6	5.1	9.6	4.9	10.0
Sheep	a/	31.8	36.9	38.6	32.0	34.5	44.8
Goats		39.9	26.0	27.8	29.3	29.8	36.1
Price and demand effects							
Food price inflation	98.9	29.6	70.7	59.1	56.7	59.7	38.6
No demand for ag/livestock products	41.0	11.8	28.9	2.7	4.7	2.0	2.0
Drop in price of ag/livestock products							
Livestock products	49.1	14.1	24.0	20.8	5.1	7.5	0.5
Agricultural products	45.8	17.2	15.8	19.3	3.1	8.8	1.1
Rise in price of ag/livestock inputs	95.9	34.6	62.9	38.0	44.0	48.0	31.8
Conflict and death							
Theft of livestock or crops	25.9	6.3	6.0	5.7	7.6	3.0	3.6
Other conflict-related shocks	24.7	8.2	9.0	4.1	5.1	3.7	3.6
Death of household member	5.2	2.2	0.0	0.0	1.4	0.0	1.5
Jijiga							
Drought (too little rain)	100	90.8	95.7	88.1	99.1	62.9	68.8
Agricultural production & livestock rearing c/							
Very bad harvest	88.2	32.1	38.2	25.8	23.9	15.3	43.4
Crop disease	78.2	40.9	12.8	28.5	24.8	24.1	12.4
Insufficient fodder for livestock	99.6	82.6	90.5	91.9	99.4	15.1	49.4
Insufficient water for livestock	94.5	70.2	84.7	80.4	21.7	6.0	59.8
Livestock disease	95.5	53.0	38.5	65.2	73.3	35.5	14.0
Livestock emaciation	98.1	76.1	81.6	92.9	97.6	48.5	45.2
Unplanned livestock deaths							
Cattle		9.9	3.6	10.1	24.8	12.5	1.6
Sheep	a/	24.0	27.1	33.7	57.2	32.3	5.8
Goats		17.9	19.8	20.2	58.8	17.0	0.0
Price and demand effects							
Food price inflation	100	93.0	92.8	95.1	96.0	88.5	82.4
No demand for ag/livestock products	92.8	34.0	40.9	43.8	46.7	38.5	25.8
Drop in price of ag/livestock products							
Livestock products	95.5	43.7	69.4	55.2	60.6	21.3	25.5
Agricultural products	90.4	35.1	52.1	39.6	43.5	29.4	29.1
Rise in price of ag/livestock inputs	97.3	49.2	61.5	50.7	71.8	49.3	41.3
Conflict and death							
Theft of livestock or crops	13.0	6.8	3.2	0.5	0.0	1.8	0.5
Other conflict-related shocks	22.8	12.4	2.7	3.5	6.6	0.5	0.5
Death of household member	9.8	1.1	4.0	1.4	0.6	1.6	0.0

a/ It is not possible to calculate the percent of livestock with an unplanned death "any time over RMS-2" because the data were only collected in any round if the respondent reported to have owned at least one of each animal at the time of the data collection.

b/ Animals are considered to be emaciated if respondents classified them as "very thin" or "thin" as opposed to "normal" or "fat".

c/ Data are reported only for households owning livestock (the large majority).

3.2.2 Downstream Drought Impacts: Agricultural Production and Livestock Rearing

In this population that is highly dependent on agriculture and livestock for its livelihood (see Smith et al. 2015), not surprisingly the drought was associated with subsequent shocks to food crop production and livestock rearing. The majority of households (greater than 70 percent) were hit by a “very bad harvest” and/or crop disease at some point over the RMS-2 period (Table 4). Numbers were particularly high in Borena for the two months preceding Round 5 (72 percent of households experienced a very bad harvest) and the two months preceding Round 2 (52 percent of households

“The hunger exposed camels to disease and they have been dying in the past two months. Camels usually resist drought but they couldn’t survive because of the disease.”

Male FGD; Jijiga

experienced crop disease). In Jijiga, the periods of greatest stress were just following the autumn rains: Round 6 for poor harvest and Round 1 for crop disease. FGD participants in both regions indicated that the drought caused widespread crop failure. In Jijiga, harvests were also reduced from a lack of pesticides as well as plant diseases and insects that respondents felt were exacerbated by the drought. Although farmers in one woreda removed worms by hand, their crops ultimately perished from drought.

With respect to livestock rearing, problems of insufficient fodder for livestock remained almost universal in Borena throughout the RMS-2 period with only a slight reprieve in Round 2. In Jijiga, the percentage of households experiencing these problems was high in Rounds 1 through 4, but dipped to relatively low levels by the end of the period (<50 percent of households). By Round 6, FGs in some communities in Jijiga reported “improved” pasture from sporadic rains that had occurred in April/May. They also mentioned that although the 2016 rainy season (April – August) was not adequate, crops that had failed from a lack of rain were being used as livestock fodder.

Problems of insufficient water for livestock fluctuated across the rounds in both areas, rising to a high of 85 percent of Jijiga households in Round 2. Qualitative data from Jijiga indicate that access to water for both households and livestock was problematic in all kebeles and had been for five years. However, the low rainfall/drought over the two years prior to the RMS-2 survey, in particular, had a cumulatively negative effect on crops, pasture, and water (particularly during the dry season), contributing to livestock deaths in most communities. Most kebeles in Jijiga reported some rains by April, which helped replenish some ponds, or *birkahs*, but water remained scarce. The qualitative data indicate that availability of water – for both human and livestock use – was equally problematic in Borena.

Consequent to problems of insufficient fodder and water are reports of widespread livestock disease, emaciation, and unplanned deaths. In Borena, livestock disease and emaciation appear to have peaked near the end of the failed autumn rains of 2015 and 2016, in Rounds 1 and 6, with deaths of cattle and goats following the same pattern (Table 4). The percentage of households experiencing a sheep death peaked at a high of 45 percent in Round 6. In Jijiga, following the pattern for fodder availability, livestock disease and emaciation were relatively high in Rounds 1-4 followed

by a declining trend in Rounds 5-6. Unplanned livestock deaths were highest in Round 4, reaching near 60 percent of households for goats and sheep.

Qualitative data is largely consistent with findings from the quantitative data. By Round 4 in Jijiga, many FGs reported cattle and shoat losses from the drought. A male FGD participant reported losing 150 shoats in April (Round 4). In another kebele, male FGD participants indicated that so many animals had died from the drought that their carcasses could not be properly disposed of, which had created a human health risk (reported in Round 4). According to one kebele chairman (reporting in Round 5), the community had lost 870 cattle and 2000 shoats from drought in one year. Such losses translate directly into reduced ability of the household to feed itself, as well as to engage in productive activities with the onset of rains (e.g., from a lack of draught power, or money from livestock sales to rent tractors, and purchase seeds and agricultural inputs).

“In this month, a number of animals, mainly shoats, died because of hunger. A household lost 18 cattle in the past two months, which is the highest disaster in the village.”

Female FGD; Jijiga

In Borena, where the quantitative data indicate greater unplanned livestock deaths in almost all rounds, very few FGs or KIs specifically mentioned large-scale or widespread death of livestock from the drought.¹⁷

3.2.3 Downstream Drought Impacts: Price and Demand Effects

Both stemming from and compounding these shocks to agricultural production and livestock rearing were fluctuating food and livestock prices and changes in demand for these sector’s products.

As for the RMS-1 drought episode (Smith et al. 2015), food price inflation was a consistent and widespread downstream impact of the 2015/16 drought. Nearly all households in both Borena and Jijiga experienced its effects at some point over the RMS-2 period (Table 4). The prevalence of households experiencing food price increases at any time over the RMS-2 period is much higher than at the baseline survey, in which households were asked to report on price increases in the previous year (a similar recall period). For Borena, the baseline percentage was 66 and for Jijiga it was 57, differences that corroborate that the repeated rain failures of this drought episode were at the root of the price hikes. Drops in demand for agricultural and livestock products, decreases in their prices, and increases in the prices of inputs show the same increased pattern relative to the baseline.

Similar to RMS-1, negative price and demand effects of the RMS-2 drought were more widespread in Jijiga than Borena, which may be related to the fact that the Jijiga area has a more diversified livelihood pattern. However decreased livestock prices were apparently a particularly greater burden in Borena. In RMS-2 Rounds 3-6, households were asked to specify which of nine changes in

¹⁷ Unfortunately, it is not possible to determine whether this is because the drought did not have as severe an impact on livestock deaths in Borena (e.g., was not greater than “normal”) or whether the information was simply not collected.

access to markets for sales of livestock had been the most significant over the previous two months. Livestock price decreases were reported by 72 percent of Borena households in at least one RMS-2 round but only 33 percent in Jijiga.

3.2.4 Downstream Drought Impacts: Conflict Shocks and Death

The increasing resource scarcities associated with drought can often result in conflict. Theft of livestock or crops was the most common conflict shock experienced by households, with just over one-quarter experiencing livestock or crop theft in Borena and 13 percent in Jijiga (Table 4).

“When the quality of existing grazing pastures is reduced due to persistent drought, our community members, including relatives, get into competition and conflict over available grazing pasture claims.”

FGD; Jijiga

Other conflict-related shocks (particularly theft of money, theft/destruction of assets, destruction or damage to houses, and violence against household members) combined were also experienced by significant percentages of households. Compared to the year prior to the baseline, in which less than five percent of households reported experiencing the various conflict shocks, conflict shocks were far more commonly reported during the RMS-2 period. This contrast suggests

that conflict may have increased due to drought-induced stressors. However, there was general consensus among FGD participants in both regions that conflict had not increased due to the drought *per se*. In Jijiga, FGs and KIs indicated conflict is rare, though disagreements and competition between community members do occur from time to time. Additionally, they indicated that the drought has had no impact on the incidence of conflicts, stating that they are also commonly “observed during the dry season.” Likewise, FGs and KIs in Borena widely and uniformly agreed that conflict, including theft of cattle and/or theft generally is either non-existent or very limited in scope and not affected by the drought.

Even so, all kebeles in Jijiga reported by Round 2 that the drought was contributing to disagreements between some married couples, mostly regarding household expenditures. Several kebeles also reported disagreements between community members as the drought wore on. One male elder indicated that conflicts sometimes emerge between community members and kebele officials over the distribution of food aid but that again, the drought had not resulted in conflicts *per se*. There were only two instances where FGD participants in Jijiga reported past conflicts. Though the drought was not perceived to have caused the conflict in either case, there had been past conflicts with neighboring clans over pasture claims.

In Jijiga, members of one women’s FG indicated that theft is considered taboo, which serves as a good deterrent. As one woman noted, “If you beg during droughts it is considered normal, but if you steal, your name is labeled with it at all times and you will be outcast.” Theft is not considered part of Borena culture either, though some resort to it during times of extreme need.

“Theft is not the culture of Borena, but when some people find it difficult to survive they engage in cattle theft.”

FGD; Borena

Just over five percent of Borena households and 10 percent of Jijiga households experienced a death of a household member at some time over the course of RMS-2. These numbers are noticeably higher than the baseline percentages of 2.6 and 7.9, respectively, suggesting that the drought may have led to increased human deaths, whether due to conflict, health effects, or food insecurity.

3.2.5 Downstream Drought Impacts: Asset Ownership

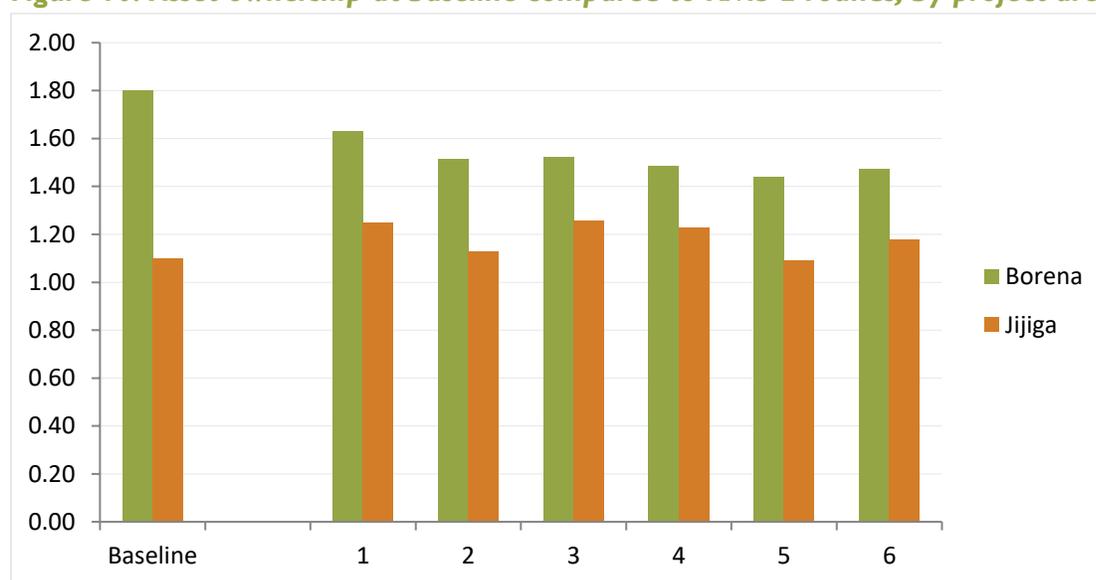
Detailed data on households' ownership of assets were collected in each RMS-2 round. Examining trends in such ownership over the course of the drought can give some insight into how the drought affected households' livelihoods. To do so, households' reports of how many of each of 21 assets they currently owned were used to create indexes of ownership of three types of assets: consumption assets (e.g., radios), agricultural productive assets (e.g., hoes), and livestock assets. An index of asset ownership covering all three of these types was also calculated.¹⁸ Index means for the two IE areas as they evolved over time are shown in Table 5 and Figure 10.

In Borena, asset ownership declined slightly over the RMS-2 period. The decline can be traced to reductions in the ownership of all three categories of assets—consumer durables, productive assets, and livestock. The greatest decline is for livestock ownership, which dropped by 20 percent. Note that overall asset ownership was considerably higher at baseline, indicating the toll that multiple climate shocks have had on households' wealth. Here again, livestock ownership in Borena declined the most, falling by 33 percent between the baseline and RMS-2 round 6. Some of these reductions in livestock holdings might partially be because of pro-active herd size reduction programs implemented by the PRIME project or livestock offtake carried out during the humanitarian response to the drought. However, the trends data on unplanned livestock deaths in Table 4, in addition to the trends data on coping strategies presented in Chapter 5, confirm that it was also driven by unplanned deaths and sales and slaughtering of livestock on the part of households.

¹⁸ The baseline data were employed to calculate the weights used in calculating the asset indexes. This choice was made for two reasons. First, the baseline data set is large (N=3,142). Second, the baseline was a relatively stable time shock-wise and thus best serves to define how the ownership of the various assets inter-correlate with one another when the system is under relatively low stress. The index was constructed based on the number of various assets owned (rather than whether or not they were owned) 21. Following Fry, Firestone, and Chakraborty (2014), to ensure comparability, baseline means and standard deviations were applied to standardize the asset ownership variables before calculating index values for the RMS-2 rounds.

Table 5: Asset ownership at baseline compared to RMS-2 rounds, by project area

	Base- line	RMS-2 rounds					
		Oct-Nov	Dec-Jan	Feb-Mar	Apr-Jun	July-Aug	Sept-Nov
		2015	2015/16	2016	2016	2016	2016
Borena							
Consumer durables	0.518	0.608	0.584	0.521	0.428	0.494	0.562
Productive assets	1.681	1.505	1.473	1.501	1.448	1.432	1.439
Livestock	0.973	0.812	0.692	0.673	0.721	0.628	0.654
Overall asset index	1.802	1.629	1.515	1.522	1.486	1.441	1.474
Jijiga							
Consumer durables	0.303	0.366	0.226	0.260	0.267	0.448	0.311
Productive assets	1.059	1.255	1.113	1.287	1.278	1.037	1.145
Livestock	0.642	0.585	0.626	0.588	0.572	0.557	0.667
Overall asset index	1.098	1.249	1.126	1.256	1.228	1.088	1.177

Figure 10: Asset ownership at baseline compared to RMS-2 rounds, by project area

Asset ownership among Jijiga households was notably lower than among Borena households throughout the RMS-2 period; it has fluctuated but shows no declining trend over the RMS-2 rounds or since the baseline. As for Borena, these trends are consistent with trends in unplanned livestock deaths (Table 4) and the use of livestock sales and slaughtering as a coping strategy (see Chapter 5). However, they are not consistent with the elevated deaths reported in the Jijiga FGDs (Section 3.2.2).

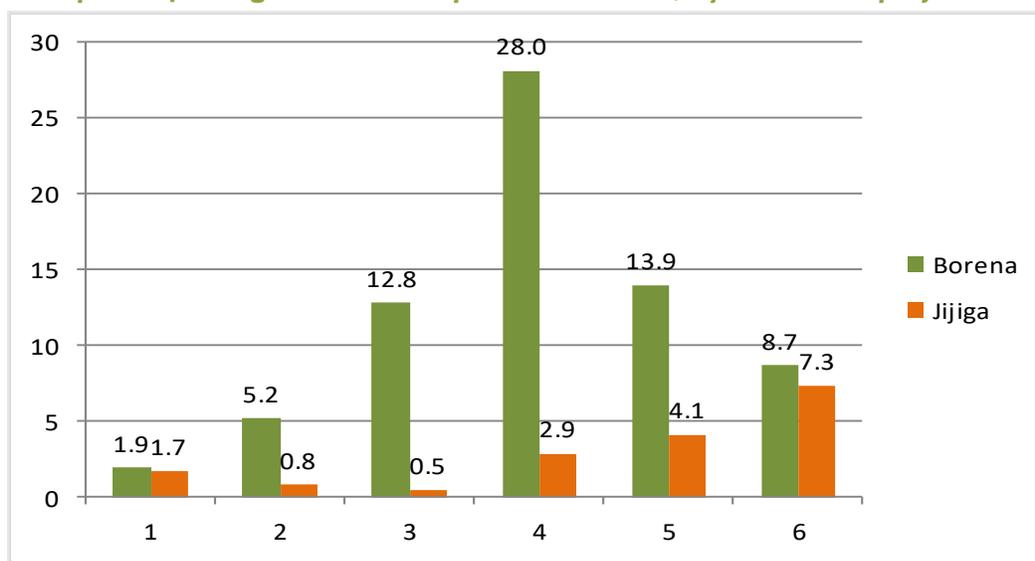
3.2.6 Downstream Drought Impacts: Children's Nutritional Status

The anthropometric data needed to calculate measures of child malnutrition, such as stunting and wasting, were not collected as part of RMS-2. However, households were asked the following question: "In the last two months, has anyone in your Kebele taken a child to get help at a feeding center because they did not have enough food to eat"? Taking a child to a feeding center for

rehabilitative nutritional therapy is a response to a serious situation where a member of the most young and vulnerable group's life is at stake due to lack of sufficient food.

The percentage of households responding “yes” to the question, that a child in their kebele was taken to a therapeutic feeding center in the past two months, is presented in Figure 11 by round and project area. In Borena, it rose precipitously between Rounds 1 and 4 to a high of 28 percent, falling to 9 percent by Round 6. The drop-off may be associated with the increase in food assistance that had occurred by the latter rounds (see Chapter 7). The percentage was lower in Jijiga throughout but rose to 7 percent by Round 6. While it is possible that the regional differences are affected by the availability of therapeutic feeding centers, these results corroborate the FEWS NET report that malnutrition had become a serious concern in Borena by the end of the RMS-2 period (see Section 3.1).

Figure 11: Percent of households reporting that a child in their kebele was taken to a therapeutic feeding center in the past two months, by round and project area



3.3 Correlations Across Shocks

In “complex risk environments” such as that found in Ethiopia, where climate shocks interact with economic and conflict shocks, it is important to understand how the various shocks being felt by households co-occur. Table 6 is the correlation matrix of the incidence of 19 types of shocks, including direct climate shocks, shocks related to agricultural production and livestock rearing, economic shocks, and conflict shocks. The correlations are calculated using the round-stacked data set (N=2,146). Only those that are statistically significant and greater than 0.1 are reported; those highlighted in purple are greater than 0.25.

Drought is most strongly correlated with livestock disease, input shortages, and reductions in the prices of agricultural and livestock prices. Excess rain, or flooding, is correlated most strongly with all of the economic shocks except food price inflation. It is notable that drought is not associated with food price inflation, but this could be because of the low variation in the experience of drought

(with the large majority of households reporting it in almost every round), and the fact that food price increases may occur with a lagged effect.

The category of downstream shocks that the two climate shocks, drought and excessive rain, are most strongly correlated with are economic shocks. Shocks related to agricultural production and livestock rearing are also most widely correlated with the economic shocks. The only other noticeable pattern is fairly strong *inter*-correlations among the broader categories of shocks (agricultural production/livestock rearing, economic shocks, and conflict shocks).

Table 6: Correlation matrix: Incidence of shocks

	Climate shocks		Agricultural production/livestock			Economic shocks						Conflict shocks						
	Drought	Excessive rain	Livestock disease	Crop disease	Bad harvest	Food price inflation	Input shortage	Low product demand	Increased input prices	Decreased ag prices	Dec. lvtstk prices	Theft of money	Theft of crops	Theft/dest. assets	Theft of livestock	Destructn: house	Land loss	Violence
Drought	1																	
Excessive rain		1																
Livestock disease	0.1488		1															
Crop disease			0.24	1														
Bad harvest				0.3	1													
Food price inflation						1												
Input shortage	0.128	0.21	0.15	0.13	0.32	1												
Low product demand		0.21	0.23	0.19	0.23	0.57	1											
Increased input prices		0.11	0.18	0.18	0.27	0.46	0.39	1										
Drop price: ag prods	0.1236	0.2	0.2	0.13	0.2	0.45	0.54	0.31	1									
Drop price: lvtstk prods	0.1477	0.19	0.13		0.19	0.33	0.39	0.19	0.61	1								
Theft of money											1							
Theft of crops											0.17	1						
Theft/dest. of assets											0.17	0.28	1					
Theft of livestock											0.13	0.14	0.27	1				
Destruction of house											0.11	0.16	0.25	0.15	1			
Land loss															0.11	1		
Violence																0.22	1	

Notes: Only correlations that are statistically significant and greater than 0.1 are reported. Purple-highlighted correlations are greater than 0.25.

3.4 Overall Measures of Shock Exposure

An accurate summary measure of overall shock exposure is needed for two reasons. First, such a measure helps to clearly show which population groups were most exposed to the drought and how their drought exposure evolved over the RMS-2 period. Second, it is needed for conducting the regression analyses in Chapters 6-8, in which households' shock exposure must be controlled for.

Two summary measures of shock exposure are constructed from the RMS-2 quantitative data. The first is the total number of drought-related shocks experienced by households, averaged across the rounds, out of the following twelve shocks:

- Drought
- Very bad harvest
- Crop disease
- Livestock disease
- Food price inflation
- No demand for agricultural or livestock productions
- Increase in price of agricultural or livestock inputs
- Drop in price of agricultural products
- Drop in price of livestock products
- Conflict related to theft of crops or livestock
- Other conflict shocks¹⁹
- Death of a household member

The second measure is an index that takes into account the perceived severity of shocks in addition to the number of shocks to which households were exposed. Perceived severity is measured from survey respondents' 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 perceptions-based index of shock exposure is a weighted average of the incidence of each shock (a dummy variable equal to 0 if not experienced and 1 if experienced) and its perceived severity as measured on the 5-point scale. The resulting scale ranges from 0 to 58, with higher values indicating greater shock exposure.

Three additional summary measures of shock exposure are derived from the AFDM data: the cumulative rainfall deficit, cumulative vegetation deficit, and soil moisture deficit. These are calculated as the sum of the monthly deviations below the norm of the measures for rainfall deviation (SPI), vegetation percentile, and soil moisture percentile presented in Figure 7-Figure 9. The deficits are given for two periods of time: July 2015-November 2016, which is considered to be the span of the current "short-term" shock episode, and January 2013-November 2016, which is the longer period of rainfall volatility of which the current shock episode is part.

The number of drought-related shocks and the perceptions-based shock exposure index indicate that **overall shock exposure, including downstream drought impacts, was higher in Jijiga than Borena** (Table 7). Despite the fact that the cumulative rainfall and soil moisture deficits were

¹⁹ "Other conflict shocks" include theft of money, theft or destruction of assets, destruction/damage to house due to violence, loss of land due to conflict, and violence against household members.

slightly higher in Borena than Jijiga, the vegetation deficit data do indicate that on-the-ground vegetation shortfalls were far higher in Jijiga than Borena, perhaps due to a physical geography more sensitive to drought. Further, as mentioned above, price and demand effects were reportedly more widespread in Jijiga, possibly related to the fact that it has a more diversified livelihood pattern. Note that the number of drought-related shocks and perceptions-based shock exposure index indicate that overall shock exposure was greatest for agro-pastoralists, the group that had the most diversified livelihoods at baseline.

Table 7: Summary measures of shock exposure, by project area and pastoralist status

Measure	All	Project area		Pastoralist status					
		Borena	Jijiga	Pastor- alist	Agro- pastoralist	Non- pastoralist			
RMS-2 household-reported data									
Number of drought-related shocks experienced	3.47	3.03 ^a	4.60 ^a	3.32 ^a	3.78 ^a	3.33			
Perceptions-based shock exposure index	13.4	11.4 ^a	18.38 ^a	12.7 ^a	14.62 ^a	12.80			
African Flood and Drought Monitor data									
Short-term shock episode (July 2015-November 2016)									
Cumulative rainfall deficit	13.2	13.8	11.9	b/					
Cumulative vegetation deficit	224.6	173.8 ^a	339.8 ^a						
Cumulative soil moisture deficit	555.8	563.7	537.9						
Long-term episode (January 2013-November 2016)									
Cumulative rainfall deficit	27.2	28.0	25.4						
Cumulative vegetation deficit	497.6	484.6	526.9						
Cumulative soil moisture deficit	887.3	982.8 ^a	670.6 ^a						
a Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.									
b The data are calculated at the kebele level and thus can not be broken down by household-level characteristics.									

3.5 Summary: Household Shock Exposure

The extended drought episode that took place over the RMS-2 period was induced by two weather phenomenon: (1) the 2015/16 El Niño Southern Oscillation, which led to what was considered Ethiopia's "worst drought in more than 50 years"; and (2) the negative Indian Ocean Dipole, which was spread more broadly across the East Africa region. The extreme weather conditions led to three consecutive failed rainy seasons, exposing households in the PRIME IE area to numerous downstream drought impacts. Data from secondary sources and both the quantitative and qualitative surveys concur that the drought was a major shock to livestock rearing and agricultural production. The majority of households experienced crop losses and/or crop diseases at some point over the RMS-2 period. Problems of insufficient fodder and water for livestock and consequent livestock disease, emaciation and unplanned deaths were widespread.

The shocks to agricultural production and livestock rearing both stemmed from and compounded economic shocks. Nearly all households in the IE area experienced food price inflation at some point over the study period. Drops in demand for agricultural and livestock products, decreases in their prices, and increases in the prices of inputs were also widespread.

With respect to asset holdings, Borena households registered a steady reduction in asset holdings as the drought progressed, and a marked drop from the baseline, revealing the toll that the multiple shocks over the previous four years have had. The same pattern of asset depletion was not found for Jijiga households, who had considerably lower asset holdings to start.

The resource scarcities associated with climate shocks such as drought can often result in increased conflict. While FGD respondents did not feel that conflict between community members had increased as a result of the drought, the quantitative data reveal a distinct uptick in thefts of livestock or crops and other conflict shocks, such as theft of money and violence against household members. As for RMS-1, FGDs did identify increased conflict between married couples as one way the drought was affecting households.

Qualitative data collection respondents stated that the drought had a significant negative impact on women, the elderly, and children. They indicated that women end up walking longer distances in search of water and food for small livestock, which takes time away from child care, income generating activities, food preparation, and other household activities. They felt that lactating women and children suffered the most nutritionally from the drought conditions.

Reflecting the negative food security impacts of the drought (see below), secondary data and analysis of the quantitative survey data both indicate that it took a toll on children's nutritional status, finding increased admissions to therapeutic feeding centers of children under five, particularly in Borena.

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

As noted in the introduction, household resilience is the ability of a household to mitigate, adapt to, and recover from shocks and stressors. In this report, resilience is measured using food security as the basis for determining whether a household has been able to maintain or recover its well-being after experiencing the drought. The measures of resilience are then used for analysis of the determinants of resilience in Chapters 6-8.

This chapter begins by examining trends in food security over the RMS-2 rounds compared to the baseline for the two PRIME IE regions. We then look at how resilient households were to the drought using (1) direct indicators of resilience calculated using the food security data; and (2) a subjective measure based on households' own perceptions of their ability to recover. Finally, the food security data are used to identify the households who are designated as resilience positive deviants and compare them to their non-positive deviant peers.

4.1 Changes in Food Security over the RMS-2 Period

The measure of food security relied on in this report is the inverse of an experiential indicator of food insecurity, the Household Food Insecurity Access Scale (HFIAS) (Coates, Swindale and Bilinsky 2007). The HFIAS is an index constructed from the responses to nine questions regarding people's experiences of food insecurity in the previous four weeks. Responses range from worry about not having enough food to actual experiences of food deprivation associated with hunger, with the nine conditions related to food security being:

1. Worry that the household would not have enough food.
2. Any household member was not able to eat the kinds of foods preferred because of a lack of resources.
3. Any household member had to eat a limited variety of foods due to a lack of resources.
4. 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.
5. Any household member had to eat a smaller meal than he/she felt they needed because there was not enough food.
6. Any household member had to eat fewer meals in a day because there was not enough food.
7. There was ever no food to eat of any kind in the household because of lack of resources to get food.
8. Any household member went to sleep at night hungry because there was not enough food.
9. 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 30 days prior to the survey (rarely, sometimes or often). A score is then calculated based on these frequency responses. The inverse of the score is taken for the analysis of this report so that the measure increases with increasing household food security. This food security index ranges from 4 to 27.

The HFIAS can also be used to categorize households into four groups: “food secure,” “mildly food insecure,” “moderately food insecure,” and “severely food insecure.” The groups are formulated based on the assumption that the severity of food insecurity progresses from feeling worried, through concerns about dietary quality, and finally, experiencing an actual lack of food. A food secure household experiences none of the nine conditions listed above, or just experiences worry, but rarely. At the other end of the spectrum, a severely food insecure household has cut back on meal size or the number of meals eaten in a day often, and/or experiences any of the three most severe conditions: running out of food, going to bed hungry, or going a whole day and night without eating.

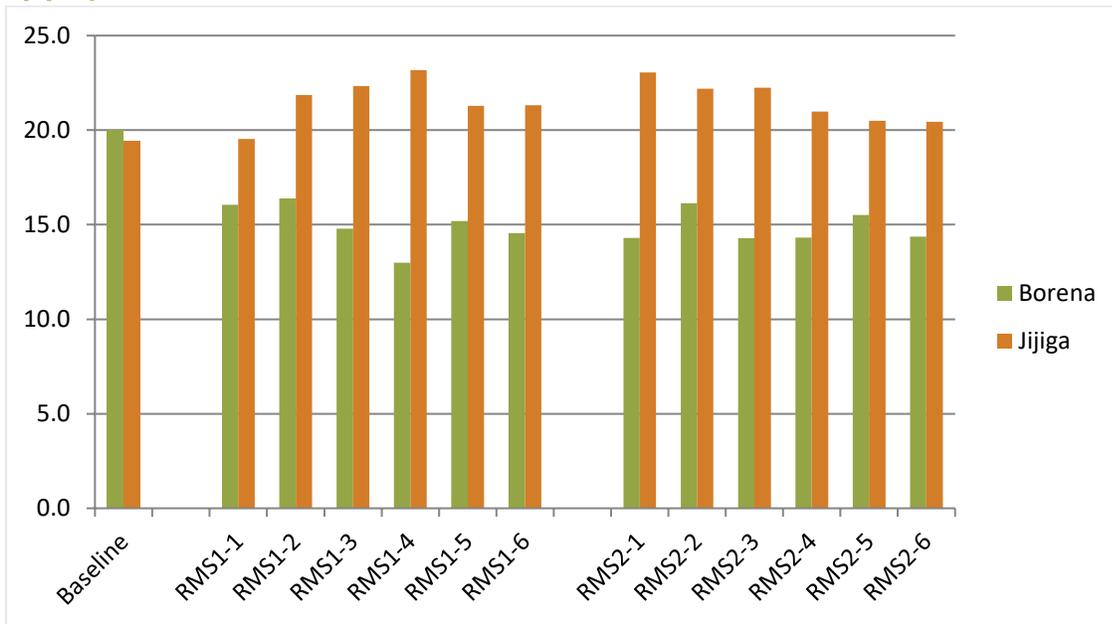
The HFIAS combines information on the sufficiency of food consumption with information on the quality of households’ diets, both of which are important dimensions of food security. A measure focused specifically on dietary quality is also employed here; a dietary diversity score calculated as the total number of food groups, out of 12, from which household members consumed food in the day prior to the survey (Swindale and Bilinsky 2006).

Table 8 documents the changes in food security that took place over the RMS-2 period in Borena and Jijiga; they are illustrated in Figure 12. Those at baseline and over the six RMS-1 rounds are also shown for reference.

Table 8: Food security at baseline compared to RMS-1 and RMS-2 rounds, by project area

	Base-line	RMS-1 rounds						RMS-2 rounds					
		Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	March 2015	Oct-Nov 2015	Dec-Jan 2015/16	Feb-Mar 2016	Apr-Jun 2016	July-Aug 2016	Sept-Nov 2016
Borena													
Food security index	20.0	16.0	16.4	14.8	13.0	15.2	14.5	14.3	16.1	14.3	14.3	15.5	14.4
Food security groups													
Food secure (%)	25.7	3.3	14.0	12.4	0.7	1.7	1.0	3.4	9.4	0.0	0.5	6.0	0.6
Mildly food insecure	3.7	5.8	1.8	0.0	1.0	0.2	0.0	1.1	0.5	1.0	0.0	2.6	0.0
Moderately food insecure	38.7	31.9	20.3	13.9	20.2	18.9	25.8	18.8	29.8	32.9	23.2	36.7	50.2
Severely food insecure	30.3	59.0	63.9	73.7	78.1	79.2	73.2	76.7	60.2	66.2	76.3	54.8	49.3
Dietary diversity score	4.5	5.2	4.8	4.9	4.7	3.6	4.2	4.9	4.3	4.6	4.9	5.2	4.7
Jijiga													
Food security index	19.4	19.5	21.9	22.3	23.2	21.3	21.3	23.0	22.2	22.2	21.0	20.5	20.4
Food security groups													
Food secure (%)	28.3	12.4	35.7	38.2	46.6	22.1	20.9	26.9	20.0	20.6	16.0	20.7	23.2
Mildly food insecure	3.8	7.1	6.4	9.0	14.0	16.8	12.4	12.0	20.7	7.0	5.9	3.7	1.4
Moderately food insecure	20.0	44.3	31.1	26.0	23.0	32.5	38.7	32.5	40.1	54.6	54.1	46.2	52.3
Severely food insecure	44.3	36.2	26.8	26.9	16.3	28.6	28.0	28.6	19.3	17.8	23.9	29.5	23.2
Dietary diversity score	3.5	4.6	4.6	4.4	4.9	4.4	4.6	5.0	4.8	4.1	4.3	4.9	4.9

Figure 12: Food security index at baseline compared to RMS-1 and RMS-2 rounds, by project area



Borena had a relatively high level of food security at baseline (20 points on the food security scale), but had experienced substantial deteriorations from that level in both RMS rounds. The total decline from baseline to RMS-2 round 1 was a full 28.5 percent. Food security exhibited a fluctuating pattern across the rounds of both surveys (Figure 12). Notably, the incidence of severe food insecurity was markedly high in RMS-2 Round 1, at 77 percent (Table 8). Its decline to 50 percent by Round 6 was accompanied by an increase in moderate food insecurity--not by increases in the percentage of households who were food secure (or only mildly food insecure). Thus, the prevalence of moderate to severe food insecurity continued to be extremely high over the period, rising to 99.5 percent by the end of RMS-2.

In Jijiga, food security was higher than at baseline in every RMS-1 and RMS-2 round. While it fluctuated across RMS-1 rounds, it declined continuously over the RMS-2 rounds, with the food security index dropping by 12.7 percent. Despite the decline, at the end of the RMS-2 period the percentage of households experiencing moderate to severe food insecurity remained high, at 75.5. Note that throughout both RMS periods the food security index was markedly higher in Jijiga than Borena.

The dietary diversity index shows no noticeable decline over the RMS-2 rounds in either Borena or Jijiga, despite the high degree of shock exposure. In addition to the fact that dietary quality is very low in both IE areas, it was observed from the baseline data that in this population greater shock exposure is associated with *higher* dietary diversity. This is because households start to diversify their diet away from the typical daily eating pattern when they are under stress, but not necessarily that the quality of their diet is in fact better. This factor should be kept in mind when interpreting the RMS-2 dietary diversity data.

4.2 Household Resilience in the Face of the Drought

The main indicator of resilience employed in this analysis is the change in food security over the RMS-2 period, that is, between Round 1 and Round 6. A secondary indicator is given by an index of households' "perceived ability to recover from the downstream impacts of the drought" that they experienced in the two months prior to the survey. This perceptions-based index is constructed based on households' subjective reports of their ability to recover from the actual shocks they experienced. The shocks used in this measure are the downstream shocks listed in Table 4.²⁰ Regarding each shock, survey respondents were asked "To what extent were you and your household able to recover?" The possible responses were:

- Did not recover;
- Recovered some, but worse off than before;
- Recovered to same level as before;
- Recovered and better off; and
- Not affected.

Table 9 reports on both indicators. The mean change in food security over the RMS-2 period is close to zero, indicating that the average household maintained its Round 1 level of food security or was able to get back to it by Round 6. The probability density of the change in food security, however, shows great variation in individual households' recovery (see Figure 13). In fact, roughly half of households were able to get back to their pre-drought food security or better, that is, they were resilient (51.3 percent), while the rest were not (Table 9).

Table 9: Resilience in the face of the drought, by project area and pastoralist status

	All	Project area		Pastoralist status		
		Borena	Jijiga	Pastor- alist	Agro- pastoralist	Non- pastoralist
Change in food security from Round 1 to Round 6	-0.72	0.18 ^a	-2.78 ^a	-0.09	-1.18	-1.36
Percent of households resilient b/	51.3	58.4 ^a	35.2 ^a	57.8 ^a	42.7 ^a	50.8
Index of perceived ability to recover c/	2.69	2.81 ^a	2.43 ^a	2.74	2.64 ^a	2.67
a Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.						
b Resilient households are those who maintained or improved on their food security over the course of the drought.						
c Mean across rounds.						

²⁰ The only exception is unplanned livestock deaths, for which ability to recover data were not collected. Drought itself is also not included.

Figure 13: Probability density of the change in food security between RMS-2 Rounds 1 and 6

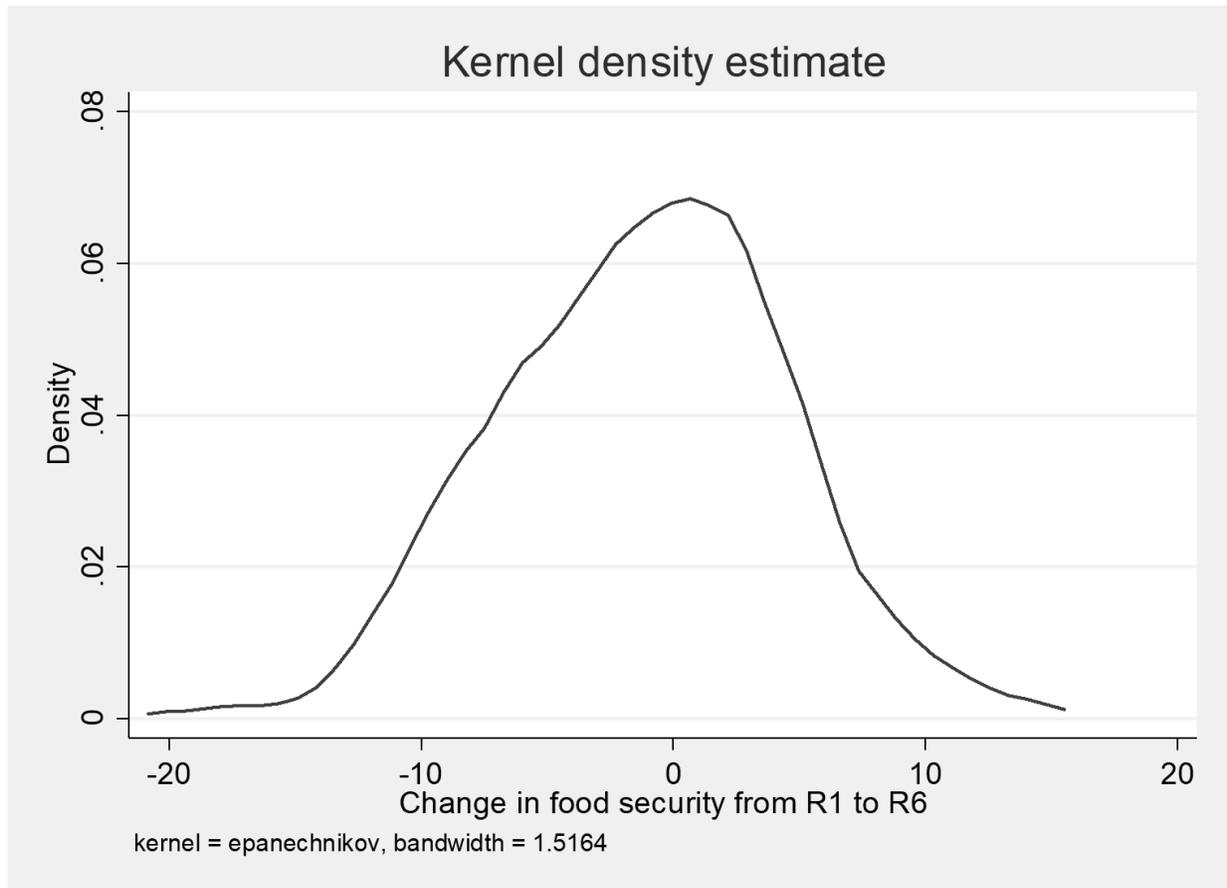
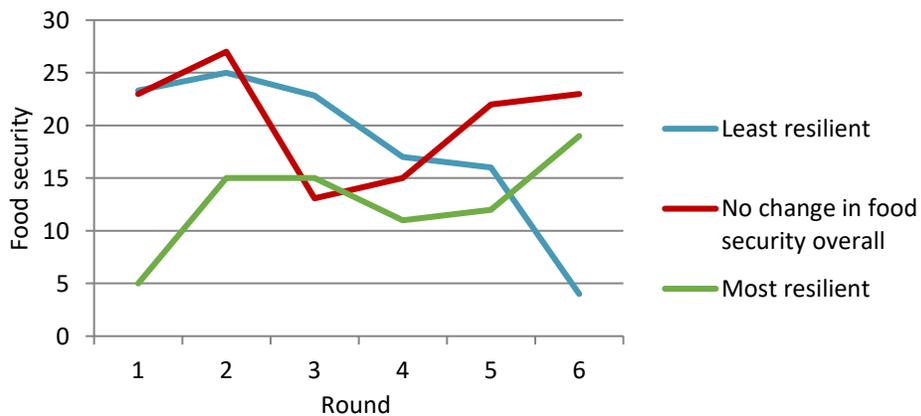


Figure 14 further illuminates households' recovery experiences, showing the food security trajectory over the six RMS-2 rounds of the sample household that (by this measure) was the most resilient (green line) and the sample household that was the least resilient (blue line). It also gives an example of a household that saw no overall change in food security (red line), illustrating that even those that "recovered" may have experienced intermediate drops and a good deal of instability over the drought period.

Figure 14: Change in food security over the RMS-2 rounds for households with the greatest and least resilience



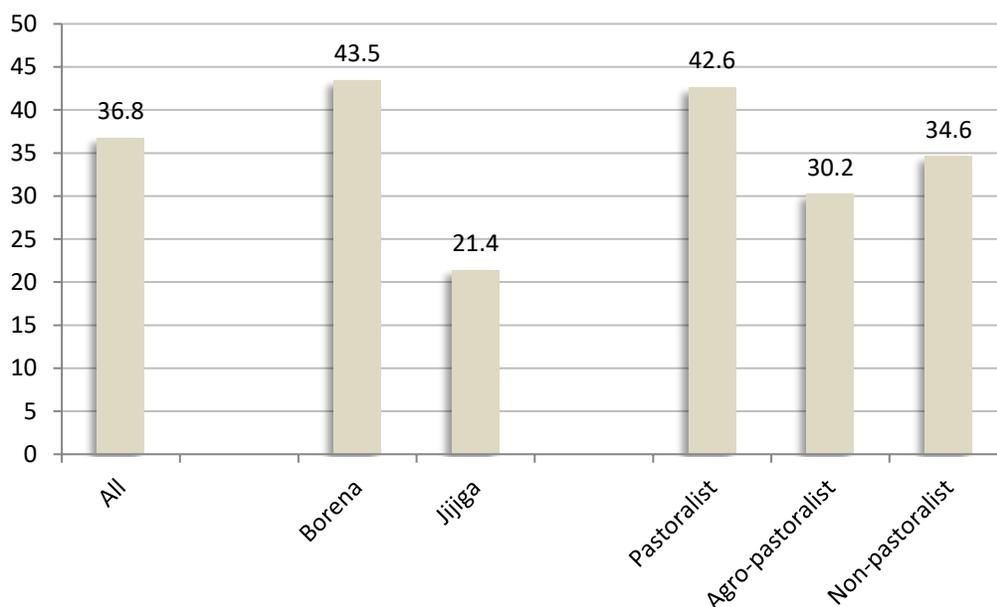
Returning to the results in Table 9, households’ resilience to the drought was far lower, on average, in Jijiga than Borena. In Jijiga only 35 percent of households were resilient while in Borena 58 percent were. This pattern partially reflects the fact that shock exposure was more severe for Jijiga households (see Section 3.4). Pastoralists as a group were more resilient than non-pastoralists. Agro-pastoralists, who depend on both farming and pastoralism for their livelihoods, were the least resilient. The perceived ability to recover index mirrors these same regional and pastoralist-status patterns.

4.3 Identification of Resilience Positive Deviants

As mentioned in Chapter 2, resilience positive deviants (PD) are households whose overall change (increase) in food security over the course of the drought was particularly high. The purpose of singling out these households is to enable investigation into what led the deviating households to do so much better than their peers and, ultimately, what interventions might help increase households’ resilience to shocks. We will undertake such investigation in Chapters 6-8 of this report.

For this study, the PDs are defined as those households whose overall change in the food security index between RMS-2 Rounds 1 and 6 is greater than or equal to two. These households not only recovered from the drought, but also had a greater level of food security after experiencing it despite being exposed to a major drought. A full thirty-seven percent of PRIME IE households are identified to be positive deviants. Consistent with the resilience data presented in Table 9, the percentage of PDs is higher in Borena and highest among pastoralists (Figure 15).²¹

Figure 15: Percent of positive deviants, by project area and pastoral status



²¹ A comparison of the percent of PDs in the PRIME low and high intensity intervention groups is given in Chapter 6 below.

Table 10 compares the food security, shock exposure, and household characteristics of the PDs compared to their “non-PD” counterparts. The PDs differ in that they had lower Round 1 food security²² and slightly lower shock exposure. Notably and importantly, the PDs are not better off economically: their asset ownership is similar to that of the non-PDs.

Table 10: Comparison of food security, shock exposure, and household characteristics of positive deviants and non-PDs

Measure	Non-deviants	Positive deviants	Difference
Food security			
Round 1	19.3	12.8	-6.51 ***
Round 2	18.8	16.7	-2.07 ***
Round 3	17.8	14.8	-2.99 ***
Round 4	16.9	15.5	-1.43 **
Round 5	17.3	16.4	-0.97
Round 6	15.4	17.6	2.27 ***
Shock exposure			
Number of shocks reported a/	3.6	3.2	-0.41 **
Cumulative rainfall deficit (current drought)	13.1	13.5	0.40
Cumulative rainfall deficit (last 5 years)	30.3	31.3	1.00
Demographic characteristics			
Household size (mean)	5.62	5.59	-0.03
Household age-sex composition (percent)			
Females 0-16	24.9	24.1	-0.82
Females 16-30	13.2	12.8	-0.43
Females 30 plus	12.4	14.7	2.26
Males 0-16	25.2	25.2	-0.06
Males 16-30	10.8	10.8	-0.03
Males 30 plus	13.4	12.5	-0.92
Female adult-only household (percent)	8.6	10.2	1.58
Education (percent)			
None	38.2	32.0	-6.21
Primary	53.1	54.7	1.61
Secondary	8.7	13.3	4.60
Pastoralist Status (percent)			
Pastoralist	41.3	52.5	11.20
Agro-pastoralist	36.8	27.4	-9.40
Non-pastoralist	21.9	20.1	-1.80
Economic status			
Asset index (mean)	1.54	1.47	-0.07
Stars indicate statistical significance at the 10%(*), 5%(**), and 1%(***) levels.			
a/ Calculated as the average when reports from all rounds are combined.			

²² Having lower initial food security is inevitable when PDs are defined as those households who have increased their food security the most since households at the highest end of the food security scale are not able to increase their food security.

4.4 A Note Regarding Resilience Measurement Using Asset Ownership Data in RMS-2

Recall that a main goal of this analysis is to investigate how the PRIME project, humanitarian assistance, and household's prior resilience capacities affected their resilience to the drought.

To do so, changes in asset ownership (in addition to food security) over the course of the drought were considered as a potential measure of households' resilience. However, preliminary analysis indicates that PRIME project implementation modalities and the implementation modalities of humanitarian assistance efforts involving productive and livestock assets (for example livestock off-take, input provision, and proactive herd size reduction) hamper the ability to single out the specific impacts of these interventions using the quantitative techniques employed here. Further research beyond the scope of this report into such modalities is needed before assets can be employed in measuring resilience for this report's purposes.

4.5 Qualitative Data on Food and Livelihood Security During the Drought

Farming and livestock raising are the two dominant livelihoods in both the Jijiga and Borena regions. Both activities are vulnerable to drought, though crops are generally perceived to have less tolerance than many types of animals, some of which (e.g., camels) are believed to be able to withstand more prolonged periods of drought than crops. In Jijiga, livestock markets are reported as few and far between. The main markets in the region for the communities surveyed in Jijiga are Hargeisa (Somalia), Hartisheik, and the town of Jijiga. Border restrictions make it challenging for households to get livestock to Hargeisa. According to men in one kebele, cross-border trading risks confiscation of livestock by police or local militia, both of whom indiscriminately accuse people of illegal trans-border trade. In particular, they noted that security issues limit women to more local markets (e.g., Hartisheik) even though prices are lower. Access to cash also constrains livestock marketing.

Men in one Jijiga community reported that they plant crops even when drought is predicted in the hopes that it will at least provide some fodder for their livestock during the dry season. A number of communities have switched to growing more sorghum than maize because it is more drought tolerant. According to some women at Round 4, cultivating khat can provide income early in a season, before other crops produce anything to sell.

Brown, dried-up khat bushes can respond quickly to rainfall, putting on a flush of new leaves that can then be harvested and sold long before other types of crops are harvestable (e.g., maize, sorghum). Small gardens also provide needed household income; onions, tomatoes and other vegetables are more valuable on the market than is maize.

“The crops are grown in a very small proportion compared to livestock rearing; when the drought comes both activities are affected. If the oxen die, it is also difficult to plough the land when the rain comes.”

FGD; Borena

Households in one kebele reportedly shifted from primarily pastoral activities to mixed cropping because of the large-scale livestock losses from drought (reported at the last round of data collection in November). Women now grow vegetables, which have higher market value and are perceived by the women to need less rainfall.

Activities around some types of trade or general employment are considered less susceptible to climate-related shocks such as drought. In most communities in Jijiga, a lack of markets (both in terms of physical markets as well as supply/demand) limits many livelihood opportunities, particularly from livestock. However, many households indicate that some sort of trading – milk, livestock, khat, firewood – is an important way of supplementing household income. Proximity to

“Due to the credit service available, the life of women in our community has begun to change dramatically. Currently, about 20 women are included in this program and they managed to start different income generating activities like petty trade, tea shops and vegetable production.”

KII; Jijiga

the large urban population in Hargeisa, Somalia, makes some types of trade more profitable than others. For example, Hargeisa represents a huge market for khat, supplied in part by production in northeastern Ethiopia, including the Jijiga area. Some of the communities perceived that trade of khat is less susceptible to drought than other agricultural activities. In part, this perceived non-seasonality is due to the fact that some khat is produced elsewhere (i.e., is not exposed to drought in the Jijiga area) and brought to the region for sale.

In Jijiga, both men and women are engaged in market activities, but only to a very limited amount and their roles differ somewhat. Women tend to be confined to selling milk or running tea shops, and in some locations harvesting and selling grasses as roofing materials for extra income. Men are engaged in livestock and cash crop trading, and petty trade such as selling charcoal. Both men and women are reported to sell khat; women tend to resell khat purchased from others and men both produce and sell it. Men sell cattle and camels, and women sell shoats. This division results primarily from traditional cultural roles, but also from distances to markets and challenges with transportation. Men are able to walk long distances with larger animals; women load shoats onto pickups.

Selling milk tends to be seasonal, from both a demand side perspective (purchasing power) and supply side perspective (production). Both demand and supply of milk decrease during the dry season; as fodder becomes scarce, milk production drops and prices increase, ultimately driving down demand. A few communities in Jijiga reported formal programs to develop women’s associations, for example, producing and marketing milk (although these groups had only been formed a month before Round 4 data collection in April 2016), as well as shoat fattening. One KI indicated that loans provided through a local savings and credit association in his kebele have supported households in various IGAs, including livestock fattening, tea and coffee shops, and petty trading.

Women respondents in one kebele mentioned an emerging source of income for men as general laborers with a new meat processing company (e.g., fattening, slaughtering, exporting). According to one respondent, men could potentially earn up to 2,800 birr per month.

According to all the FGDs and KIs in Jijiga, the primary impact of low rainfall and drought is reduced productivity from agriculture and limited alternative livelihoods options, both of which in turn result in livelihood and food insecurity. Crop failure, livestock disease and deaths, and widespread hunger were reported in every community surveyed. By Round 2, most of the communities in Jijiga perceived they were not recovering well from the drought. They had no reserves of water or other natural resources that they perceived would help them further cope with the drought or other shocks/stresses. According to participants, communities with productive assets and access to natural resources (e.g., fertile land, water) are better able to successfully respond to shocks/stresses.

There was widespread recognition among all FGs and KIs in both regions regarding the differential effect of the drought on women, the elderly, and children in particular. FGs in both regions acknowledged that women end up walking long distances in search of water and food for small livestock, which takes time away from child care, income generating activities, food preparation, and other household activities. Male FGs in Jijiga also suggested that women – particularly lactating women – and young children often suffer the most nutritionally, as *“the feeding pattern and frequency was beyond their bodies’ tolerating level.”*

In Borena, crops are considered “supplemental” to livestock and not an “alternative” to it. This is consistent with the relatively high degree of pastoralist households compared to Jijiga, where agro-pastoralism dominates (see Chapter 1, Figure 2). FGs and KIs noted that lack of rainfall and resulting land degradation have made farming a non-viable livelihood activity in Borena for some time. One community indicated they had not cultivated any crops in the three or four years prior. What crop production does occur is primarily used for home consumption. Maize, sorghum, and teff are the main crops produced in the region. Poor rainfall discourages farming (e.g., land is difficult to plough, diminished likelihood of harvest) and places an even heavier reliance on livestock rearing.

Livestock rearing in Borena is viewed as a more economically vital and resilient strategy for coping with recurrent shocks at both the household and community levels. Cattle, shoats and camels are the dominate animals raised in the region, usually by men. Poultry rearing, usually performed by women, was also reported to be an important source of income for the household. Most communities go to great lengths to maintain their livestock herds in the face of extreme shock.

Men in Borena are primarily responsible for livestock trading, including shoats, cattle, and camels. Livestock trading is considered seasonal, with prices going down in times of drought, when animals typically suffer from hunger and increased incidence of disease, diminishing their value.

“With support of an NGO, women in the community are engaged in small trading activity, although most of the women are not profitable in the business.”

FGD; Borena

Qualitative data suggest that overall, trading was not a robust source of alternative income in Borena, mainly because it did not generate much income. Trading was, however, considered an important source of income for women. Petty trading includes milk, eggs, butter, and chickens. Restaurants and tea shops in urban areas were perceived by women as less susceptible to drought because people “need to buy food items.” Ultimately, however, prolonged drought affects people’s ability to purchase anything. In one Borena community, there were so many women participating in marketing activities supported through a NGO that “no one was able to buy from the other.”

4.6 Summary: Household Food Security and Resilience in the Face of the Drought

The measure of food security relied on in this report is the inverse of an experiential indicator of food insecurity, the Household Food Insecurity Access Scale, that combines information on the sufficiency of food consumption with that on the quality of households’ diets. The experiences of the IE regions with regard to food security over the course of the drought episode differ substantially. In Borena, food security had dropped substantially between the baseline and RMS-2 Round 1 (by 29 percent), but showed no continued deterioration across the RMS-2 rounds. By contrast, in Jijiga, food security was *higher* in RMS-2 Round 1 than it was at baseline, but the average household experienced a continual decline as the drought progressed. These patterns are likely influenced by the humanitarian response to the drought, which is addressed below.

Individual households’ resilience to the drought is measured using two indicators: the change in food security they experienced over the RMS-2 rounds and a perceptions-based indicator of their ability to recover from the drought and its downstream impacts. Analysis of the former measure indicates that roughly half (51.3 percent) of households in the IE area were able to get back to their pre-drought food security or better by round 6 of the data collection. The other half were not. Households’ resilience to the drought was far lower, on average, in Jijiga than Borena (35 versus 58 percent). Pastoralists as a group were more resilient than non-pastoralists. Agro-pastoralists, who depend on both farming and pastoralism for their livelihoods, were the least resilient.

The qualitative data concur that a primary impact of the low rainfall and drought is food insecurity. Respondents linked the inability of households to maintain their food security with reduced productivity in agriculture, limited alternative livelihoods options, and limited trading opportunities due to scarcity of markets

5. HOUSEHOLD RESPONSE: COPING STRATEGIES EMPLOYED FOR DEALING WITH THE DROUGHT

This chapter uses both the quantitative and qualitative RMS-2 data to explore how households responded to the drought conditions they faced. It looks at a variety of coping strategies, including selling or consuming assets, changes in labor patterns, financial strategies, migration, and relying on both informal and formal sources of assistance.

5.1 Quantitative Data on Coping Strategies

5.1.1 RMS-2 Households' Reports of Their Coping Strategies

In each RMS-2 survey round, after survey respondents were asked whether or not they experienced drought and related shocks in the previous two months, they were asked “How will you cope with the stressful events you are experiencing?” Table 11 gives the percentage of households who reported they would employ each of 27 coping strategies, which we use here as an indicator of the percentage who actually did use the strategies.

The most commonly reported coping strategy was to reduce food consumption, signaling how fragile households' food security was in the face of this severe drought. Other widely-employed coping strategies fall into three broad categories: selling or consuming assets, financial strategies, and relying on assistance from others.

Over half of households sold livestock to manage the shocks they faced, and six percent slaughtered livestock. While no households reported selling household items or agricultural productive assets, 12 percent consumed seed stock being held for the next season, a particularly negative strategy that undermines future livelihood.

The most commonly employed financial strategy was to borrow money from friends or relatives, employed by over 40 percent of households. Others were to purchase food on credit and draw down on savings. Note that since data on the latter strategy were only collected in Rounds 3-6, the actual six-round percentage would certainly be higher.

Table 11: Percent of households employing various coping strategies in any RMS-2 round, by project area and pastoralist status

Coping strategy	All	Project area		Pastoralist status		
		Borena	Jijiga	Pastor- alist	Agro- pastoralist	Non- pastoralist
	(Percent of households)					
Reduce food consumption	88.0	91.3 ^a	80.2 ^a	91.1 ^{ab}	85.7 ^a	84.8 ^b
Sell or consume assets						
Sell livestock	55.7	59.8 ^a	45.9 ^a	63.8 ^{ab}	54.6 ^{ac}	39.0 ^b
Slaughter livestock	6.3	8.5 ^a	0.8 ^a	8.6 ^a	4.1 ^a	4.6
Sell household items (e.g., radio, bed)	0.0	0.0	0.0	0.0	0.0	0.0
Sell agricultural productive assets (e.g., plough)	0.0	0.0	0.0	0.0	0.0	0.0
Consume seed stock held for next season	12.1	16.5 ^a	1.3 ^a	15.8 ^{ab}	9.6 ^a	7.7 ^b
Change labor patterns						
Take up new wage labor	14.7	15.3	13.1	11.4 ^a	14.6	22.2 ^a
Send children to work for money	1.4	1.9 ^a	0.1 ^a	1.2	1.1	2.1
Participate in food-for-work or cash-for-work	1.1	1.1	0.9	1.0	1.3	0.9
Financial strategies						
Borrow money from friends or relatives	42.8	48.7 ^a	28.4 ^a	49.9 ^{ab}	38.5 ^a	33.7 ^b
Borrow money from an NGO	0.1	0.2	0.0	0.3	0.0	0.0
Borrow money from a bank	0.1	0.1	0.0	0.0	0.0	0.3
Borrow from a money lender	1.1	1.5 ^a	0.0 ^a	1.6 ^{ab}	0.8 ^a	0.3 ^b
Lease out land	0.2	0.1	0.6	0.0	0.3	0.7
Purchase food on credit	27.1	22.5 ^a	38.2 ^a	23.8 ^a	28.5	32.3 ^a
Draw down on savings (only for rounds 3-6)	18.9	26.5 ^a	0.7 ^a	26.7 ^{ab}	13.5 ^a	9.6 ^b
Migration						
Migration of some family members	13.9	12.1	18.4	14.3	16.2 ^a	9.3 ^a
Migration of the whole family	2.1	1.3 ^a	4.2 ^a	2.0	2.6	1.7
Send children or an adult to stay with relatives	1.9	1.0 ^a	3.9 ^a	1.5	2.4	1.7
Rely on informal sources of assistance						
Money/food from family members	28.6	38.2 ^a	5.4 ^a	37.3 ^{ab}	21.2 ^a	21.0 ^b
Remittances from a relative (only for rounds 3-6)	11.0	15.3 ^a	0.6 ^a	15.5 ^{ab}	7.4 ^a	6.4 ^b
Money/food from non-relatives						
...living in your community	15.3	8.1 ^a	33.0 ^a	10.5 ^a	20.6 ^a	17.8
...living elsewhere	28.2	32.9 ^a	16.8 ^a	29.7	25.2	29.5
Rely on food aid						
Receive food aid from the government	20.0	18.8	23.1	18.7	21.3	21.1
Receive food aid from an NGO	9.7	12.2 ^a	3.5 ^a	12.1 ^a	8.8 ^b	5.6 ^a
Other						
Take children out of school	2.1	1.2 ^a	4.2 ^a	1.4	2.7	2.7
Move to less expensive housing	1.1	0.1 ^a	3.6 ^a	0.5	1.8	1.2

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

Note: The values presented refer to the coping strategies planned to be used in response to the shocks experienced in the previous two months with two exceptions: purchasing food on credit and consuming seed stock. These were strategies households reported actually employing in the 7 days prior to administration of the survey.

With respect to assistance from others, households relied on both informal and formal sources, the latter from the government and NGOs. Nearly 30 percent relied on money or food from family members, some of which was in the form of remittances. Another 30 percent relied on money or food from non-relatives living outside of their communities. Households were less likely to rely on formal sources of assistance than informal sources: 20 percent reported relying on food aid from the government and 10 percent from an NGO.

In addition to the above strategies, nearly 15 percent of households reported that they planned to take up new wage labor, and 14 percent that some members of the household would migrate in order to cope with the shocks they were facing. Some particularly negative coping strategies, including sending children to work for money, taking children out of school, and borrowing from a money lender, were rarely employed.

A number of coping strategies were far more prevalent in Borena than Jijiga. In addition to selling and slaughtering livestock, Borena households reported relying on consuming seed stock held for the next season at a much higher rate than did Jijiga households (17 versus 1 percent, respectively). Borena households were also much more likely to borrow money from friends or relatives or receive money or food as gifts from family members, receive remittances from a relative, and receive money or food from non-relatives living elsewhere. Finally, they were more likely to draw down on savings or receive food aid from an NGO. Jijiga households, on the other hand, were more likely to purchase food on credit, engage in migration, and receive money or food as gifts from non-relatives living in their own community.

Turning to differences across the pastoralist status groups, pastoralists were – not surprisingly – most likely to sell livestock, while non-pastoralists were least likely to do so. Being less dependent on agriculture than the other groups, pastoralists were also more likely to consume seed stock held for the next season. Non-pastoralists, who are far more involved in wage work (see Smith and Frankenberger 2015), were more likely than the other groups to take up new wage labor. In terms of financial strategies, pastoralists were more likely than the other groups to borrow money from friends or relatives and draw down on savings. Non-pastoralists purchased food on credit at a higher rate, possibly because this option was more available to them. Finally, pastoralists were more likely to rely on assistance from family members (including remittances) and to receive food aid from an NGO.

5.1.2 Comparison of Coping Strategies Used by RMS-1 and RMS-2 Households

Table 12 compares the use of the coping strategies in any round of RMS-2 with that of RMS-1. The RMS-1 recall period was one month. The RMS-2 recall period was two months,²³ which might naturally lead to a pattern of strategies being more prevalent in RMS-2. However, we find instead that, where noticeable differences are apparent, the majority indicate a *higher* prevalence in RMS-1.

While over 10 percent of RMS-1 households resorted to slaughtering livestock (in the previous month), only 6 percent of RMS-2 households had done so (in the previous two months). Additionally, borrowing money from friends or relatives, and receiving money or food from them, was much higher in RMS-1 than RMS-2. This pattern of households being less able to depend on their main source of assistance in desperate times is consistent with the qualitative data (see Section 5.2 below) and is a sign of widespread dwindling resources. Other coping strategies that are notably higher among RMS-1 than RMS-2 households include taking up new wage labor and migration of some family members. The less prevalent use over time of these strategies is a strong indication that, following a series of multiple, back-to-back shocks, coping strategies exhaustion was setting in.

Keeping in mind the differences in recall periods, three coping strategies appear to have substantially higher prevalence among RMS-2 than RMS-1 households: drawing down on savings, receiving remittances from a relative, and receiving food aid from the government. The latter is due to the Ethiopian government's response to the 2015/16 El Niño drought (see Chapter 7).

²³ Two of the coping strategies were collected using 7-day recall in both RMS-1 and RMS-2: Consume seed stock held for the next season and purchase food on credit.

Table 12: Percent of households employing various coping strategies: Comparison of the RMS-1 and RMS-2 surveys

Coping strategy	RMS1 (one-month recall)	RMS2 (two-month recall)
Reduce food consumption	80.1	88.0
Sell or consume assets		
Sell livestock	55.0	55.7
Slaughter livestock	11.0	6.3
Sell household items (e.g., radio, bed)	0.19	0.0
Sell agricultural productive assets (e.g., plough)	0.28	0.0
Consume seed stock held for next season a/	15.7	12.1
Change labor patterns		
Take up new wage labor	19.7	14.7
Send children to work for money	2.4	1.4
Participate in food-for-work or cash-for-work	12.3	1.1
Financial strategies		
Borrow money from friends or relatives	56.1	42.8
Borrow money from an NGO	--	0.1
Borrow money from a bank	0.1	0.1
Borrow from a money lender	2.8	1.1
Lease out land	0.3	0.2
Purchase food on credit a/	29.4	27.1
Draw down on savings b/	9.7	18.9
Migration		
Migration of some family members	19.2	13.9
Migration of the whole family	1.9	2.1
Send children or an adult to stay with relatives	2.6	1.9
Rely on informal sources of assistance		
Money/food from family members	43.3	28.6
Remittances from a relative b/	3.5	11.0
Money/food from non-relatives		
...living in your community	--	15.3
...living elsewhere	--	28.2
Rely on food aid		
Receive food aid from the government	5.1	20.0
Receive food aid from an NGO	7.1	9.7
Other		
Take children out of school	3.6	2.1
Move to less expensive housing	0.4	1.1
a/ In contrast to the other coping strategies, the data for these strategies were collected using 7-day recall in both RMS-1 and RMS-2.		
b/ RMS-2 values refer only to Rounds 3-6.		

5.1.3 How Coping Strategies Changed Over the Course of the Drought

Table 13 presents the percentage of households engaging in the coping strategies as they evolved over the six RMS-2 rounds. A common trend in both Borena and Jijiga is an increase in reliance on assistance from non-relatives and from people living outside of one's own community. The changes in the sources of informal assistance are particularly stark for Jijiga, where the percent of households receiving assistance from relatives dropped from 16 to 5 over RMS-2 rounds 1-6, the percent receiving assistance from *non-relatives* living in one's own community rose from 15 to 56 percent, and the percent from *non-relatives* living elsewhere from 8 to 39 percent. In Borena, the increase in assistance from outside of one's own community shows up in a doubling of the percent of households receiving remittances between Rounds 3 and 6. These trends suggest that as households' most immediate sources of informal assistance began drying up they were turning to the wider pool of social capital, which may contain households less exposed to the drought and its downstream impacts.

In Borena, other noticeable trends are declines in consuming seed stock as a coping strategy and in taking up new wage labor, the latter which is a continuation of the declining trend since RMS-1. On the financial side, far fewer households were buying food on credit in round 6 than round 1, and more were turning to drawing down on their savings, the latter which is also a continuation of the downward trend noted between RMS1 and RMS2.

Jijiga households saw a large decline in the use of migration as a coping strategy across the rounds as well as a sharp drop off (from 21 percent of households to 0 percent) in the prevalence of households who were taking children out of school.

Table 13: Percent of households employing coping strategies, by RMS-2 round and project area

Coping strategy	Borena						Jijiga					
	R1	R2	R3	R4	R5	R6	R1	R2	R3	R4	R5	R6
	(Percent of households)						(Percent of households)					
Reduce food consumption	83.8	82.2	95.7	98.5	91.4	97.2	74.6	73.1	87.0	88.7	71.1	87.3
Sell or consume assets												
Sell livestock	53.0	60.7	65.4	53.4	63.1	62.9	52.8	54.8	42.0	33.2	42.2	49.7
Slaughter livestock	11.6	8.9	7.1	7.9	3.8	12.1	3.4	0	0.5	0	0	0.9
Sell household items (e.g., radio)	0	0	0	0	0	0	0	0	0	0	0	0
Sell agricultural productive assets	0	0	0	0	0	0	0	0	0	0	0	0
Consume seed stock	28.1	26.6	18.7	9.8	0.6	15.2	0	0.5	1.3	3.8	1.6	0.9
Change labor patterns												
Take up new wage labor	13.2	21.9	18.4	14.3	14.9	8.4	9.1	12.1	15.0	13.2	21.2	7.8
Send children to work for money	3.8	2.5	0.6	1.0	2.8	0.4	0	0.5	0	0	0	0
Participate in food/cash-for-work	5.0	0	0.6	0	0	1.2	2.8	0.5	0.8	0	0	1.6
Financial strategies												
Borrow money from friends/relatives	33.9	56.2	57.6	38.6	55.6	49.6	31.0	36.3	10.7	10.3	42.5	38.9
Borrow money from an NGO	1.1	0	0	0	0	0	0	0	0	0	0	0
Borrow money from a bank	0.5	0	0	0	0	0	0	0	0	0	0	0
Borrow from a money lender	1.9	1.0	1.2	0.5	2.2	2.2	0	0	0	0	0	0
Lease out land	0	0	0	0.5	0	0	0.9	2.8	0	0	0	0
Buy food on credit	33.3	38.5	22.4	15.2	14.3	9.9	24.4	42.0	38.4	35.6	53.0	35.0
Draw down on savings (rounds 3-6)	-	-	20.4	17.6	28.4	39.7	-	-	0	0	0.8	1.9
Migration												
Migration of some family members	16.8	9.0	11.4	10.1	9.5	16.0	42.0	12.8	19.4	4.3	9.3	22.7
Migration of the whole family	3.7	0.5	0.9	0.5	0	2.0	22.5	2.6	0.5	0	0	0
Send member to stay with relatives	0.5	0.9	1.5	1.4	1.1	0.6	19.7	1.7	0.9	0	0.5	1.1
Rely on informal sources of assistance												
Money/food from family members	34.8	46.1	48.5	30.3	31.2	37.9	15.7	3.0	2.7	4.3	1.8	4.7
Remittances (rounds 3-6)	-	-	9.9	8.6	20.7	21.9	-	-	0	1.1	1.3	0
Money/food from non-relatives												
...living in your community	13.0	0.5	4.6	12.6	11.5	6.7	15.1	14.3	23.8	49.8	40.0	56.3
...living elsewhere	14.6	17.6	21.4	55.3	57.2	32.0	8.0	5.5	13.8	20.0	15.5	38.5
Rely on food aid												
Receive food aid from government	14.3	3.7	8.4	41.2	29.9	16.2	15.5	18.1	9.0	45.6	18.1	33.1
Receive food aid from an NGO	20.4	8.3	11.2	10.9	6.7	16.1	10.8	3.3	1.3	3.6	1.0	1.1
Other												
Take children out of school	2.4	2.6	0.5	1.6	0	0	23.4	0.9	0.5	0	0.8	0
Move to less expensive housing	0	0.4	0	0	0	0	21.4	0	0.5	0	0	0

5.1.4 Strategies Employed by the Resilience Positive Deviants

Examining the differences in the coping strategies employed by the resilience PDs and their non-deviant peers can help to gain insight into how and why the PDs fared so much better. Table 14 first reports on “unadjusted” differences across the two groups. The right-hand panel of the table then reports “adjusted” differences that take into account basic differences between the PDs and non-PDs in factors such as initial food security, shock exposure, demographic characteristics, and economic status. This adjustment is undertaken to ensure that differences in the prevalence of coping strategies are not solely reflecting differences in these underlying factors.²⁴

Table 14: Comparison of coping strategies employed by positive deviants and non-positive deviants

Coping strategy	Unadjusted percents				Adjusted percents a/			
	All	Positive deviants	Non-deviants	Difference	Non-deviants	Positive deviants	Difference	Percent difference
Reduce food consumption	88.1	90.6	86.6	4.0 **	88.1	83.4	4.7 ***	-5.3
Sell or consume productive assets								
Sell or slaughter livestock	57.0	60.5	54.9	5.6	54.1	55.7	-1.6	3.0
Sell agricultural productive assets (e.g., plough)	0.0	-	-		-	-		
Consume seed stock held for the next season	12.0	12.2	11.9	0.3	12.0	5.4	6.6 ***	-54.8
Change labor patterns								
Take up new wage labor	14.6	12.4	15.9	-3.5	15.3	12.0	3.3 *	-21.6
Take children out of school/send to work	3.4	2.3	4.1	-1.8 **	3.9	2.7	1.2	-30.8
Participate in food-for-work or cash-for-work	1.1	1.5	0.9	0.6	1.0	1.2	-0.2	22.2
Financial strategies								
Borrow money from friends or relatives	42.6	45.6	40.9	4.7	41.5	35.6	5.9 **	-14.2
Borrow money from a money lender	1.1	1.5	0.8	0.6	0.8	0.9	-0.1	12.7
Buy food on credit	27.1	26.5	27.4	-0.9	29.2	28.4	0.8	-2.7
Draw down on savings	18.9	23.7	16.0	7.7 **	15.9	13.9	2.0	-12.6
Receive food or financial assistance								
Receive food aid	26.9	27.8	26.4	1.4	25.2	29.0	-3.8	15.1
Receive money or food from family	28.4	33.6	25.4	8.2 **	25.8	19.9	5.9 **	-22.9
Receive money or food from non-family	37.9	40.7	36.2	4.4	37.0	42.0	-5.0 *	13.5

Stars indicate statistical significance at the 10%(*), 5%(**), and 1%(***) levels.

a/ Means are adjusted for demographic characteristics, pastoralist status, asset ownership at Round 1, shock exposure, and Round 1 food security.

Focusing on the adjusted data, we note at the outset that the PDs were less likely to reduce their food consumption, which would be expected given that they are identified based on changes in food security over the course of the drought. Otherwise, the biggest difference between PD and non-PD households is that PD households were nearly half as likely to consume seed stock held for the next season. They were also less likely to take up new wage labor. Finally, they were less likely to borrow money from friends or relatives or receive money or food from family members.

²⁴ The variables adjusted for are listed in Chapter 4 Table 10, where population mean differences across the PD and non-PD groups are reported.

What strategies were the PDs more likely to use? Most notably, they were more likely to receive money or food from non-relatives. Thus, it is possible that PDs were more resilient – at least in part – because of an ability to rely on assistance from people outside of their families, which helped them to avoid consuming seed stock, taking up new wage labor, and relying on family members.

5.2 Qualitative Data on Coping Strategies

FGD participants and KIs listed a number of strategies for coping with the drought that were common among all groups. In both regions this included temporary migration, selling livestock, relying on social capital, fodder, and formal assistance. In Jijiga, water harvesting and purchasing water were important and widespread strategies for dealing with drought. A few FGs and KIs in

Jijiga indicated people prayed and several communities acknowledged they take no specific actions to cope with shocks generally. As one women’s FGD in Jijiga indicated, they simply pray “and observe what God will do.” A key informant in one woreda in Jijiga reported his community only says “Allah knows” and tries to get by until the next rainy season. Praying was also reported in Borena, including a group prayer ceremony conducted by elders.

“Elderly members also go out in large numbers with their sticks and they put the sticks down in front of them and pray to God to give us the rain.”

FGD; Borena

Reliance on Social Capital

One of the primary ways households in both Jijiga and Borena reported coping with the drought and its downstream effects was to rely on social capital, or mutual support. FGDs and KIIs in both regions indicated that sharing – mutual support – was a longstanding and deeply ingrained part of their cultures. According to a KI in Jijiga, *“the practice of sharing resources is the very essence of the community’s culture.”*

“The Borena share what they have with neighbors and people of the same clan. If it was not for social support, people would have died from drought and other related problems.”

FGD; Borena

The main ways community members support each other are by sharing milk, food, crops, cash, livestock, water, and labor. In Borena, FGs and KIs suggested that sharing is high in times of abundant water and pasture, with cattle and goats provided to less fortunate households. During the dry season, households share food, money, and labor. While the qualitative data in both regions strongly indicate that the tradition of sharing has

continued even during drought, it also revealed a strong trend in decreased ability to share, given the prolonged and severe nature of recent droughts. Thus, everyone simply has less to share, and yet more people need help. Some FGs and KIs in Borena indicated that sharing has actually increased, perhaps because the number of people in need of support was increasing. By Round 1, groups in Borena noted that the diminishing availability of household resources and assets had impacted the volume and frequency of support being provided to other households. Additionally, several KIs in Borena noted that, *“the practice of sharing resources among households showed a marked difference through the years, as the younger generation [is] living a solitary and individual-centered life.”*

In Jijiga, the drought was reported to have affected the level of support households in some – though not all – communities could provide by Round 3, resulting in less sharing within those communities. FGD participants indicated that while sharing still occurred, the amount shared was less than in previous years. For example, cattle and camels were previously provided to households in times of need but the practice had been abandoned due to recurrent droughts, which had wiped out herds. In most communities, goats are the main livestock provided to households in need, either as a gift or loan.

“When a household experiences mass livestock death, there is reciprocal expectations; other community members collect goats and give them to the destitute household as a form of donation.”

KII; Jijiga

Some KIs in Jijiga indicated that during drought, a household may be expected to keep only one-half of its crop harvest for its own use while the remaining harvest is distributed among more destitute households within the community. As one FGD participant described it, *“We don’t let fellow neighbors or relatives die of hunger while we are preserving food for tomorrow.”*

While sharing is part of the cultural fabric in both regions, some kebeles in each region reported having a communal system for organizing assistance as well as individual sharing arrangements between households and neighbors, while others indicated sharing happened on an individual basis only. One member of a men’s FG in Jijiga said, *“It’s a culture of sharing and kinship. The settlement is built of siblings and closer relatives therefore no one will eat alone while another household is hungry. Relatives from Somaliland and elsewhere in Ethiopia send money in times of serious drought.”*

One kebele in Jijiga described a system in which the head of the household in need asks the community elders/ influential leaders for help, who then gather food (e.g., cereals, flour) from other households in the community. The beneficiary household is not identified in order to prevent any feelings of embarrassment associated with receiving assistance. In Borena, one FGD participant explained that a man is not considered a “Borena man” without cattle; if drought kills all of his cattle, he is no longer a “Borena man.” Thus, his clan members raise cattle for him; he is helped to recover, reunite with his clan, and regain his status as a “Borena man.”

In Jijiga, an old, traditional practice of sharing goats was described as “*degosi*” (see Box 1). Although the goat to be shared (i.e., donated) remains with the original owner, the household in need is able to use it as collateral at local shops for food and other purchases with the understanding that s/he will repay their debt from sale of the goat. Likewise, in Borena, traditional practices exist that oblige clan or community members to contribute livestock to an affected household so that it can rebuild its herd. A KI in Borena explained, *“Through the ‘busa’ system, goat and cattle milk are provided for households with children and the very old. Through ‘gonofa,’ restocking is done to people who lost herds. These two systems have helped the inhabitants of the village to recover from recurrent drought and related problems.”* In other parts of Borena, the tradition of “*guma*” operates similarly to help households that have lost their herds.

Box 1. Degosi: a tradition of sharing

“Degosi is a long existing practice [in the] community by which the head of a seriously destitute household secretly cuts part of the newly born goat ear as a symbol of showing interest in claiming [as a] gift that specific goat from the owner. Once a needy individual puts that mark, the owner comes to realize someone from his community has a serious problem and needs his support. Then he begins to discover who that person was. Though an individual has full right to refuse to give his goat, conventionally there is a belief that someone who refuses to do so will be cursed. Thus, in most cases, owners are ready to give their goat to the needy individual.”

KII; Jijiga

Other forms of mutual support include loaning out livestock (e.g., oxen) to help households with agricultural activities such as plowing, and providing group labor (e.g., agricultural, construction). Men in Jijiga described a labor sharing practice, known as “guss,” as a group of 10 men who plough the fields of farmers who lost their oxen. Guss is given voluntarily, with no expectation of reciprocity, unless they find themselves in need at some point. Because the use of a tractor for ploughing is more common than using animals, guss may also involve raising money for the tractor rental fees. In some communities, those with tractors agree to “loan” their services until after harvest. In Borena, groups described two practices: “gotele” and “gereaa,” both of which involve the tradition of community members working together to assist households in need of labor, such as at harvest time or providing oxen to help cultivate.

A KI in Jijiga described the long-standing practice of sharing animal feed common in his community; crop residues stored as fodder are not only shared within the community but with more distant kebeles who send trucks to purchase it. In Borena, helping to herd other households’ cattle to better grazing areas was reported.

In both regions, reports were fairly consistent from all kebeles and across rounds that priority groups for sharing were the most vulnerable households (e.g., those who had lost cattle or family members), children – one’s own or others, and the elderly. One FG participant in Borena elaborated, “When money is given to support a household it usually is given to a man, and if it is food and milk, it is handed to a woman to manage it for the household.”

“Since no one is better in managing problems, all of us work and lean on one another in harsh times. Living communally is our most efficient system of overcoming community problems.”

FGD; Borena

Sale of Livestock

A common strategy for dealing with the drought in Jijiga was to sell livestock, reported by all FGD participants and KIIs. Most households resort to selling livestock after the drought has had some impact on their food or income, often when livestock body conditions are diminished and/or prices low. At Round 4, FGD participants indicated that households in their community do not typically sell their cattle ahead of a drought, in large part because this is simply “not part of their culture.”

Participants stated that most people hope their cattle will survive a drought, and thus wait to sell them. A KI in another kebele mentioned the lack of a saving culture as primarily responsible for households not selling their livestock before a drought. It was explained that when there is money, *“We eat, chew chat, and spend it in a short period of time. Selling livestock ahead of time when [the] price is good and saving money in a bank doesn’t work in our community. Besides, planning for the long term is not common in our community, so no one works hard to deal [with] challenges that are ahead of us.”* However, a KI in a different kebele indicated at Round 5 that more households have been saving money (and crops) in the past few years than *“was the culture before.”*

“When drought is persistent and households unable to cope, as a first strategy they sell [a] portion of their goats to buy some household items for consumption.”

KII; Jijiga

At Round 4, a women’s FG noted that selling livestock was not a viable option primarily because their herds were typically very small. In contrast, a male FG indicated that in order to save money, some households sell their camels and cattle before they lose weight and then buy them back when conditions are better (e.g., good grazing). Apparently, in this village the idea of selling livestock as early as possible is considered an effective strategy for coping with drought, but was not widely practiced elsewhere in the region.

The situation is similar in Borena; livestock are sold both as a coping strategy (i.e., distress sale) and an adaptive strategy (i.e., selling in advance of drought). As was the case in Jijiga, the more prominently practiced strategy is to sell livestock once drought has set in, often when prices are low and livestock body conditions may be compromised. As one FG member noted, *“The market for cattle was high in the area but in the past two years thin cattle are coming to the market so merchants from big cities are not visiting the area.”*

“[Households] wish and hope the drought to pass quickly, rather than sell out their livestock.”

FGD; Borena

Although selling livestock is one option – and a fairly common one – for dealing with drought, it is often considered a last option. Simply put, people tend to hope the drought will be short-lived and they will not need to sell their livestock. At the same time, FGD participants in Borena acknowledged that households with larger herd sizes appear to be better able – and more willing – to sell parts of their herds as an adaptive strategy

for dealing with drought. Such sales provide them with income to purchase fodder or feed, food for household consumption, etc. Pre-emptively selling livestock is perceived as a way to reduce herd size, making it more manageable – and likely to survive – during drought, while also providing capital to purchase feed for the remaining animals. Thus, there is, perhaps, stronger “pro-active” management of herds rather than simply responding once a drought has become severe. One FG reported at Round 2 that households in their community sell all their livestock prior to the drought, save the income, and restock once the drought is over.

Livelihood Diversification

Crop and livestock production are the predominant livelihoods strategies in both regions and are both negatively affected by drought. When faced with severe drought or acute reductions in crop harvests, households look to other sources of generating income – or food. One women’s FG in Jijiga reported at Round 2 that women were engaged in selling khat, groundnut, and firewood as a way of bringing in income during times of drought. At Round 5, a KII indicated that some households had begun to plant onions and other vegetables that produce a little better under dry climatic conditions.

In Jijiga, women engage in milk production and marketing activities, and selling firewood or charcoal as ways of augmenting household income. It was mentioned in at least one village that there are limited opportunities to diversify, for example, into small businesses because no one has money to purchase anything. Male FGD participants in one kebele reported that individuals will sometimes form groups to collect groundnuts during the harvest in order to store and sell them at a later date – and higher price. In Jijiga, a new meat and dairy processing plant has provided some employment opportunities for both men and women.

As early as Round 2 in Jijiga, a common strategy in some kebeles for dealing with the drought was to send children/young adults to Hargeisa, where they seek jobs as housemaids or shepherds and remit money to help support their families. Men and young boys also seek employment (e.g., daily labor, herders, porters (“hamal”²⁵) in nearby towns to help their families. Brokers serve to link families with job opportunities in Somaliland. Women are left to care for children and household chores, often limiting their ability to engage in other IGAs as a coping strategy during drought. By Round 3, one KII indicated that many people from his community had been seeking employment in Hargeisa in order to remit money to their family members affected by the drought. According to the informant, most of the migrants had not adapted well to city life (e.g., traffic jams). Car accidents, becoming ill, or falling victim to thieves, etc. are all risks to which they are not accustomed and that threaten their ability to help their families – even after returning home (e.g., if they are weak from illness or injured).

“If [drought] is still pervasive, they will send their grown-up children to work in Hargeisa.”

KII; Jijiga

At least one women’s FG in Jijiga indicated the remittances from their husbands’ who had migrated to other areas in search of work were not worth the costs. As one women said, *“We are satisfied when we see our men around and working on the farm with us,”* and that the amount of remittances they are able to send are not worth their absence from the family.

²⁵ Someone who carries goods for others.

In Borena, the situation is not fundamentally different than in Jijiga. Most FGs and KIs noted that livestock and crop production are the two main livelihood strategies in Borena, both of which are vulnerable to drought. Although a number of FGs suggested there were no alternatives to crop production and livestock rearing, some people engage in petty trade, particularly women, and migrate to nearby towns in search of day labor or to rent a motorbike (e.g., for deliveries). In particular, FGs reported a trend among young people to migrate to urban centers “for the urban life.” As early as Round 1, FGs mentioned that some people were building houses in nearby urban centers as a source of rental income, which they described as “the dominant mode of reducing impact of shock” in that community. Although not widespread, particularly in communities more distant or isolated from urban centers, at least one KI thought the potential was there in other communities. Increasingly, selling off livestock to invest in a house or motorbike is seen as a viable IGA. Still, such a marked shift in livelihoods is rare, as it results in abandonment of the traditional pastoral lifestyle in the region.

“Since the area is semi-urban, there residents should save money and try to invest in building houses in town and engage in petty trading activities as well.”

KII; Borena

Migration

Migration is a common strategy for dealing with the drought that is employed in both Jijiga and Borena. Migration in terms of temporary relocation to an urban area in search of work was discussed above. However, migration is also used as a strategy for dealing with drought in that some – or all – household members migrate with their livestock to areas with better grazing and pasture. According to one KI in Jijiga, “When we experience serious drought, we first send two or three individuals to potential grazing areas and let them map better suited pasture areas; they will also hold conversations with elders to get permission for migration; finally, those households severely affected by the drought will migrate to these areas.” Men and often young boys migrate with their livestock in search of better water and pasture, with the hope that the cattle will gain weight and one or two can be sold. Such seasonal migration can last up to six months, at least as reported in some kebeles in Jijiga. Women in one community indicated they do not migrate with their livestock because their herds are so small (i.e., less than six animals).

Qualitative data from Borena suggest a similar approach: a few people – mostly “strong men” – migrate with the livestock in search of better pasture and water, sometimes up to 30 km according to a KI in Borena. Some communities indicated they do not migrate per se; rather they have two designated settlements between which they travel when drought persists in one or the other. Communities acknowledge, however, that land has become scarce, which makes migration difficult. For some, migration is a last resort.

Although common, migration was not universally considered problem-free by all groups. At least one FG in Borena indicated that some men “leave their families and disappear.” Other risks associated with migration included lack of an adult male at home

“The community has long adopted the practice of sending some family members or all family members to other areas.”

KII; Borena

in case something happened (e.g., flood, fire, etc.), and the potential for conflict over pasture and water resources. Generally, FGs and KIs in Borena indicated such conflicts have been successfully resolved through the efforts of elders and/or the government. In both regions, the general perception was that there are fewer occurrences of conflict over pasture and water resources now than in the past, even during times of drought. In Borena, one FG described the situation thus, “Both communities in Ethiopia and Kenya living adjacent to the borders are Borena, and they welcome each other when there is drought in each side.” Still, migration can take a toll on livestock, weakening or even killing them before they reach their destination.

Collecting/Storing Water

Across all kebeles in Jijiga, storing water was an important strategy for dealing with drought. Many households and communities store water in ponds (e.g., “harro”), or larger reservoirs (e.g., “birkahs”), either by harvesting rainwater or purchasing it from water trucks. During times of drought, particularly prolonged drought, community water resources often run dry. One of the primary ways communities deal with the lack of water during times of drought is to purchase it from other areas. According to a KI in one kebele, trucked in water reportedly cost 6 birr per 20 liters of water. Water stored in this manner allows households to “resist shortage of water caused by drought for two to three months.” A participant in a woman’s FGD indicated that the community deals with drought not only by storing water but also by using it carefully.

Rainwater harvesting is another strategy for helping communities deal with drought and was mentioned by all qualitative groups in Jijiga. Individual households often rely on small ponds, while communities often build large communal reservoirs for both domestic use and livestock. Harvesting rainwater may – but does not always – involve the use of plastic sheeting or cement to line a reservoir in order to keep the water from seeping into the soil or plastic as a cover to prevent evaporation. The high cost of plastic to line water storage ponds prevents many households in Jijiga from building their own. According to one FGD participant, his community does not receive the same support as some nearby communities, “... there is not [the] same support here; if we are given plastics we could have donated water to the whole of Ethiopia.” At Round 3, one KI indicated that he

“Most of the time our men work together to deal with [the] problem of water by constructing water collection reservoirs.”

FGD; Jijiga

had sold his camel in order to purchase water harvesting plastic, which cost him 5000 birr. Households who cannot afford their own ponds often work together to share the costs and use of the water. Large cement-lined reservoirs require resources that are beyond the capacity of communities to deliver and are typically supported by NGOs or government initiatives.

In most communities in Jijiga, community leaders mobilized households around collective action to deal with the drought, although some communities indicated such mobilization was lacking. In the first round of data collection (October 2015), many communities indicated they mobilized around harvesting rainwater, which primarily involved construction of ponds or water reservoirs (e.g., birkahs, “ellas,” harros). Depending on how much water is stored in the reservoir, several KIs in Jijiga indicated they can serve their communities up to three months during drought.

Conserving water is also important. Community processes are put into place to ensure effective utilization of communal water sources by individual households. Some communities reported that their leaders invoke policies designed to regulate and manage household and community use of water from communal birkahs, ponds, and other sources. However, a general lack of action on the part of community leaders – as well as lack of access to resources and knowledge – in developing action plans for dealing with shocks/stresses was noted in all qualitatively surveyed communities in the Jijiga area.

Nearly all FGDs in Jijiga felt that water, or lack thereof, was the key reason their communities were not effectively able to deal with or recover from the drought. Groups were unanimous in suggesting that if they simply had enough water (i.e., in birkahs, reservoirs, ponds, etc.), they would be able to effectively deal with shocks such as drought. For example, members of one FGD indicated their community has a well-built birkah that allows a men’s cooperative to engage in production of high-value vegetables and seeds. Although the current drought affected production, income from the sales of vegetables and seeds helps them cope better than nearby communities. Another community’s water cooperative develops rainwater catchment ponds and then sells the water during the dry season. Water collected in lined ponds was used in at least one community to irrigate crops – but also required a pump (and presumably a generator).

Water harvesting/collecting activities were also mentioned by FGs and KIs in Borena as ways of dealing with the drought, but were not elaborated on in as much detail. Digging ponds and bore holes prior to the rains, as well as harvesting rain from roof-tops were all briefly mentioned.

Saving Grain/Fodder

In addition to storing water, a number of FGD participants agreed that storing grain/fodder was a good strategy for dealing with drought in Jijiga. According to a KI at the first RMS round of data collection, “Households in our area save [store] crops and legumes up to [a] maximum of one year. This crop storing is primarily aimed to withstand drought or poor harvest period.” One female FGD participant suggested that it was a good strategy because animals in good body condition can be sold to purchase household food as well as fodder for remaining animals. Men in a different kebele reported at Round 6 that storing grains underground, in particular, is very effective and can provide food for up to a year. They also noted that households who had begun collecting and storing surplus fodder from field stubble were able to sell it during times of drought or use it as feed for their livestock. One male FGD participant said he had sold an ox to purchase food and fodder, and saved some of the money for seed and tractor rental.

Borena benefits from well-developed traditions around area enclosures, wet/dry season pasturing, and historical migration routes and agreements. Recurrent and prolonged droughts, however, have impacted this system and communities look to other strategies for ensuring access to livestock fodder under such circumstances. In Borena, FGs and KIs described several practices related to fodder, including cutting grass in the mountains and storing it for later use, making hay during the wet season for use in the dry season, and storing crop residues as fodder. At Round 2, FGD participants mentioned purchasing fodder as a strategy, especially for large herds. In at least one community, households raised money to purchase and share fodder from a nearby town.

Reliance on Community Leaders

Community leaders include village elders/clan leaders and local kebele officials, who mobilize community resources to help support poor households or those needing help during times of crisis. In Jijiga, most FGDs rated the effectiveness of their community leaders at organizing support for members of their communities as generally poor, primarily because they simply lacked access to any resources. Two male FGDs in Jijiga suggested that even when support or assistance was provided, community leaders often prioritized its distribution among their family and friends, rather than to those most in need. According to FGD participants in at least one kebele, 50 kg bags of wheat provided through PSNP are commonly traded for khat in the kebele office, or sold to local merchants by kebele officials.

“We use the money we have on hand, we share whatever resources we have, and we try to cope until the next rainy season. But if the rain doesn’t come, it would be [a] disaster. The only option left is migrating with the livestock and the whole family.”

KII; Jijiga

Data collected in Round 2 in Jijiga revealed that male FGD participants – in one kebele in particular – perceived their leaders as corrupt and negligent compared to the leaders in a nearby kebele in Oromia, who they considered as committed, responsible, and resourceful. A KI from the same village said, *“There is a village in front of us which is in Oromia region, that village receives grain aid and fodder for their cattle frequently from Oromia government. Though we face the same drought season there is no support for us from our regional governors I don’t feel that we belong to the same country.”* A women’s FG in Jijiga indicated that their community leaders were more concerned with reporting to woreda officials than with organizing support for needy households.

“There is no activity by [an] NGO or other agency without kebele involvement.”

KII; Jijiga

In contrast, most KIs²⁶ in Jijiga perceived that, for the most part, community leaders were effective in organizing support for those households in need of assistance. In one kebele, the kebele administration reportedly encourages households to save money for “bad days” and when drought is predicted to sell their livestock before drought conditions occur. According to the KI, the kebele also helps ensure a village’s productivity by providing households engaged in farming with seeds and tractor services on credit. The kebele administration acquires the seeds from the woreda agriculture office, as well as from households with large seed stocks, and makes them available to households in need. Beneficiary households are expected to pay 200 birr per acre for the services they receive, but may pay after the harvest.

As reported at Round 3, community leaders in several kebeles in Jijiga organized support for members of their communities who lost livestock from the drought primarily by providing goats and cattle donated by households who still had herds. In this case, the support was coordinated by the kebele administration and mobilized by community elders, who are respected and help ensure that households who are able to contribute do contribute. According to another KI, his kebele

²⁶ All but two (out of 15) key informants interviewed held some position within their kebele administration.

administration collects money from households during times of drought in order to have water trucks deliver water to the kebele.

Again, the situation is similar overall in Borena; some communities consider their relationship with government officials as good, while others do not. Some communities organize themselves to communicate with government leaders. In other communities, individual members contact officials

through the woreda administration, and still other communities rely on a group of elders to represent them to the kebele administration. One community in Borena indicated they do not rely on clan or personal links with woreda authorities in terms of accessing assistance. Rather, government offices are contacted through the kebele administration. As in Jijiga, there were reports of favoritism by woreda officials, particularly in terms of providing support to family and friends rather than those most in need during the drought.

Requests to government authorities in Borena include support for IGAs, constructing water points or pipelines for households in town, drinking water for people and animals, supplying fodder, cereal aid, construction of schools and health centers, and emergency food aid. Most FGs and KIs in Borena feel their local governments are under-resourced; they do not have the resources available to adequately support community needs, even in the absence of an emergency.

“When all the ponds have dried out, the kebele administration mobilizes fund raising/contributions among community members and they usually raise 5000-10000 birr to rent a truck to bring water from distant areas to the kebele.”

KII; Jijiga

Reliance on Local Early Warning Information

When asked how their communities prepare for – or protect themselves from – drought, findings from the qualitative data in Jijiga are somewhat mixed. On the one hand, most FGD participants in Jijiga indicated their communities have no advance warning about impending shocks. Some, however, indicated they relied on traditional ways to predict the weather and could take certain actions in preparation for drought. Groups in several kebeles indicated their elders used the stars to predict drought. According to one FGD participant, *“If the star appears on Saturday there will be drought and if it’s still here on Sunday it is predicted a large number of animals will die eventually.”*

“How is it possible for us to know about the problem in advance? It is all about the will of Allah and we will simply look for what happens.”

FGD; Jijiga

At the last round of data collection (November), one FGD participant indicated her community predicts the weather based on the direction of the wind. When the direction is from north to south, the prediction is for drought. When drought is predicted, the community begins searching for better pasture and water resources so they can migrate and for areas of good crop production that will also have crop residues they can purchase as fodder. Community members

also begin saving crops/crop residues, fodder, and money. Men in a different kebele reported that when clouds *“slightly cover the sky just before the rainy season,”* good rains are predicted and the community digs new ponds and cleans out existing ones in anticipation of harvesting the rains.

However, most groups in Jijiga indicated their communities did little, other than pray, to prepare for and mitigate the impact of drought. One woman at Round 4 said, *“There is no preparation at all. The drought might come anytime and we just face it until all our capacity is exhausted.”* Respondents indicated that most communities in the Jijiga area do not have sufficient capacity – or resources – to effectively prepare for and deal with shocks/stresses. Thus, most respondents felt that virtually nothing had been done at the community level to deal with the 2015/2016 drought in any of the communities surveyed. Women in one kebele indicated that their community does not engage in any type of collective action to try and deal with drought because people feel there is nothing they can do, given that everyone is affected and they are all poor and have no resources.

As previously mentioned, communities in Jijiga actively engage in collecting and storing rainfall in reservoirs or ponds and consider this as an effective way to “cope with” drought. It should be noted that piped potable water is not available in these communities, therefore reservoirs or ponds are the main water sources for these communities regardless of the threat of drought. Clearly then, some communities may simply not perceive their efforts to harvest/store rainwater as strategies to specifically mitigate the impact of drought.

Qualitative data from Borena also show that, in general, communities do not have access to early warning information and rely instead on traditional methods of prediction. Elders use a combination of techniques, including certain constellations, animal behaviors or autopsies, and natural phenomenon, such as cloud formations. Early predictions of shocks allow communities in Borena to pre-emptively sell their livestock when prices are higher. Income is used to buy livestock fodder or staple grains for household consumption, to facilitate IGAs, or to save for later use. Such predictions are also used to begin preparations for seasonal migration to better pasture. Community elders typically facilitate such activity, including sending out community members, who sometimes need to travel long distances to scout for available pasture and water sources.

Other Strategies for Dealing with Drought

- In some communities in Borena, gold mining represents a unique opportunity for earning income during drought. However, it is not common as it is looked down upon by the community, who feels the young men who go are being irresponsible toward their families, or may be engaging in extra-marital affairs outside their village.
- According to two KIs at Round 5, some households in Jijiga used the rains in April/May as a sign to expand the amount of their land under cultivation. In both villages, large-scale livestock losses reduced the need for large areas of pasture. Thus, households felt they should clear and cultivate more land in order to produce and store more grain/fodder for times of drought.
- At Round 2 in Jijiga, members of one FGD reported that members of their village had acknowledged they needed to better exploit opportunities for farming provided by a nearby river, and that men had organized themselves around activities designed to improve agricultural lands and to work along the shore of the river.

- At the final round of data collection in November (Round 6), participants in a male FGD mentioned a growing trend in marrying into communities that have better grazing and water resources. This is seen as a legitimate survival strategy, in that a person who is married to a man or woman in the village with better resources can easily relocate with their livestock or get help from their spouse's family. As one man in the FGD said, "... [the marriage relation] gives us a right to access pasture, farmland, and residence, along with other supports like food." According to another participant, relations with other communities through marriage is a long-standing tradition, contributing to reciprocal support – and lack of conflict – between nearby communities because of their clan relationship.
- One male FGD in Jijiga reported a "new strategy" for dealing with drought was being used in their kebele by Round 1. Households were cutting and storing as fodder an invasive weed that caused a bitter taste in milk produced by livestock that grazed on it. However, when cut and dried, it did not produce bitter milk. Thus, use of this weed represented one of their primary strategies for dealing with the drought.
- A few male FGs in Jijiga mentioned the practice of separately herding male and female sheep in order to limit births during the dry season, when drought is at its worst. They also reported digging the roots of bushes to use as feed for their animals when grass becomes too scarce from drought.
- Men in one kebele in Jijiga reported that they had registered as refugees in order to receive assistance from the UNHCR.

5.3 Summary: Household Response: Coping Strategies for Dealing with the Drought

In all RMS-2 rounds the most commonly-reported strategy used by households to cope with the drought was to reduce food consumption, a sign of how fragile households' food security was in the face of this severe drought. Other widely employed strategies identified in the quantitative data fall into three broad categories: disposing of assets, financial strategies, and relying on assistance of others. The most commonly-employed strategy involving assets was to sell livestock. Borrowing money from friends or relatives, purchasing food on credit, and drawing down on savings were the most common financial strategies. The greatest source of assistance from others was money or food from family members or non-relatives living outside of one's village.

Many coping strategies were less prevalent in RMS-2 than they were in RMS-1 or showed a declining trend over the RMS-2 rounds. These include slaughtering livestock, taking up new wage labor, migration and, notably, relying on friends and relatives for food or money. These trends are a sign of widespread dwindling resources and income generating opportunities; they are an indication that, following a series of multiple, back-to-back shocks, coping strategies exhaustion was setting in. While reliance on family members declined over the course of the drought, there was an increase in reliance on assistance from non-relatives and people living outside of one's own community. These trends indicate that as households' most immediate sources of informal assistance began drying up they turned to their wider pool of social capital, to households less exposed to the drought. Two coping strategies that saw an increase both from RMS-1 to RMS-2 and across the RMS-2 rounds was drawing down on savings and receiving food aid from the government. The latter is likely related to the Ethiopian government's strong response to the 2015/16 El Niño drought.

Consistent with the quantitative data, the qualitative data point to relying on social capital and selling livestock as two major strategies used by households to cope with the drought. Other important strategies identified in the qualitative data are: diversification of income sources or foods eaten, migration with livestock to places with better pasture and water, storing water and grain, relying on community leaders for mobilizing resources, and using local early warning information. Of note are reports from both Jijiga and Borena that communities do not have access to formal early warning information and rely instead on traditional methods of prediction of climate conditions.

6. DROUGHT RECOVERY: THE ROLE OF PRIME PROJECT INTERVENTIONS

The overall goal of the PRIME project is to reduce poverty and hunger by enhancing resilience to climate change through market linkages. It was launched in October 2012 and will end in September 2017. This chapter investigates whether its activities up to and including the RMS-2 period have served to enhance households' resilience to drought, specifically in the context of the El Niño/Indian Ocean Dipole drought of 2015/16. Note that a full impact evaluation employing advanced evaluation techniques will be undertaken using the endline data collected in December 2017.

6.1 Evidence on the Impact of the PRIME Project on Households' Resilience in the Face of Drought

Have PRIME project interventions implemented to date enhanced households' resilience to drought? As detailed in Chapter 3, the methods employed for examining this question are (1) standard growth regressions, in which the dependent variable is the change in food security over the six RMS-2 rounds (an indicator of the degree of households' resilience to the drought); and (2) positive deviance probit regressions, in which the dependent variable is a dummy variable indicating whether or not each household is a resilience positive deviant (PD). PDs are households who stand out as not only having recovered from the drought but ending up in a better position, as gauged by their food security, by the end of the study period (round 6) than at its beginning (round 1) (see Chapter 4).

In addition to a set of household and community characteristics, both regression analyses include two key independent variables: a dummy variable distinguishing the two PRIME IE intervention arms and the degree of households' shock exposure. The intervention arms represent the intensity with which households are exposed to the project's interventions, either "high intensity" (HI) or "low intensity" (LI) as designated by PRIME project staff. Specifically, PRIME staff were asked to rank the level of intensity of three categories of project interventions from 1 (least intense) to 5 (most intense) for each kebele in the IE area. The categories are (1) livestock productivity; (2) livestock market demand; and (3) natural resource management and climate change adaptation. An intensity score ranging from 3 to 15 was then calculated. All kebeles with scores of 9 or less were placed in the LI intervention group. Kebeles with scores of 10 or more were placed in the HI group.²⁷

²⁷ The original rankings were done for all kebeles at baseline; they were updated specifically for the RMS-2 kebeles prior to this analysis.

Shock exposure as an independent variable²⁸ is measured using the cumulative rainfall deficit between July 2015, when the drought episode began, and November 2016, when RMS-2 data collection ended (see Section 3.4 for details).

It is important to keep in mind that standard growth regression and probit PD analysis as employed here do not fully account for the possibility of “selection bias” in estimates of the impact of the project on households’ resilience. The type of selection bias of most concern is targeting by project administrators of kebeles that were expected to be less able to recover from shocks. In this case impact estimates could be biased downwards, increasing the chance that no positive impact is found when in fact there was one.

Table 15 compares the HI and LI groups of households on a number of characteristics as measured at the time of the baseline. Of most interest are significantly or substantially lower resilience capacities in the HI group, which would indicate that it was purposely targeted for more intense concentration of PRIME interventions. According to the indexes constructed of these concepts (see Chapter 8), we find no significant difference in the absorptive, adaptive, or transformative capacities of these groups. We can thus proceed to use the regression analyses in exploratory (if not “causal”) analysis with confidence that the regression coefficients are not substantially biased due to targeting of less resilient areas.

Table 15 also reports on baseline differences in economic status, food security, shock exposure, and demographic characteristics of the HI and LI groups. No differences can be detected in economic status, in initial food security, and in most demographic characteristics of households. However, the HI group had a slightly higher shock exposure in the five years preceding the baseline (which may or may not correlate with more recent shock exposure) and double the percent of non-pastoralists compared to the LI group. The latter is associated with lower representation of both pastoralists and agro-pastoralists and is controlled for in the regression analysis (using dummy variables identifying these groups).

²⁸ For this report, the shock exposure that best summarizes the severity of exposure to the drought—the cumulative rainfall deficit from the time the drought began to the time of the data collection—was focused on in the multivariate analysis.

Table 15: Comparison of baseline characteristics of low-intensity and high-intensity RMS-2 households

Measure	Low intensity	High intensity	Difference
Resilience capacity			
Absorptive capacity	60.9	60.9	0.00
Adaptive capacity	47.0	50.1	3.10
Transformative capacity	47.4	52.8	5.40
Economic status			
Asset index (mean)	49.3	50.1	0.80
Animals (Tropical Livestock Units)	7.7	5.6	-2.10
Per capita expenditures (USD)	1.60	1.90	0.30
Food security			
Food security index (inverse of HFIAS)	18.9	20.2	1.30
Shock exposure (in 5 years before baseline)			
Cumulative rainfall deficit	25.2	26.3	1.10 ***
Demographic characteristics			
Household size (mean)	5.7	5.4	-0.30
Female adult-only household (percent)	0.1	11.8	11.72
Education (percent)			
None	35.2	36.6	1.40
Primary	56.0	50.1	-5.90
Secondary	8.8	13.3	4.50
Pastoralist Status (percent)			
Pastoralist	47.9	39.9	-8.00 ***
Agro-pastoralist	36.4	27.1	-9.30
Non-pastoralist	15.6	33.0	17.40 ***

Note: Stars indicate statistical significance at the 10%(*), 5%(**), and 1%(***) levels.

6.1.1 Standard Growth Regressions

The growth regression results are presented in Table 16. The key variables of interest are the intervention intensity dummy variable and shock exposure. The coefficients of these variables are not statistically significant in the basic model. However, when an interaction term between shock exposure and intervention intensity is included, they are statistically significant, as is the interaction term.

The results indicate that PRIME project interventions reduced the negative impact of drought exposure on households' resilience.

They imply the following relationship between shock exposure (SE), being in the HI group, and households' resilience (R):

$$R = -4.45 * HI - 0.322 * SE + 0.392 * SE * HI.$$

The estimated impact of SE on our measure of resilience is thus:

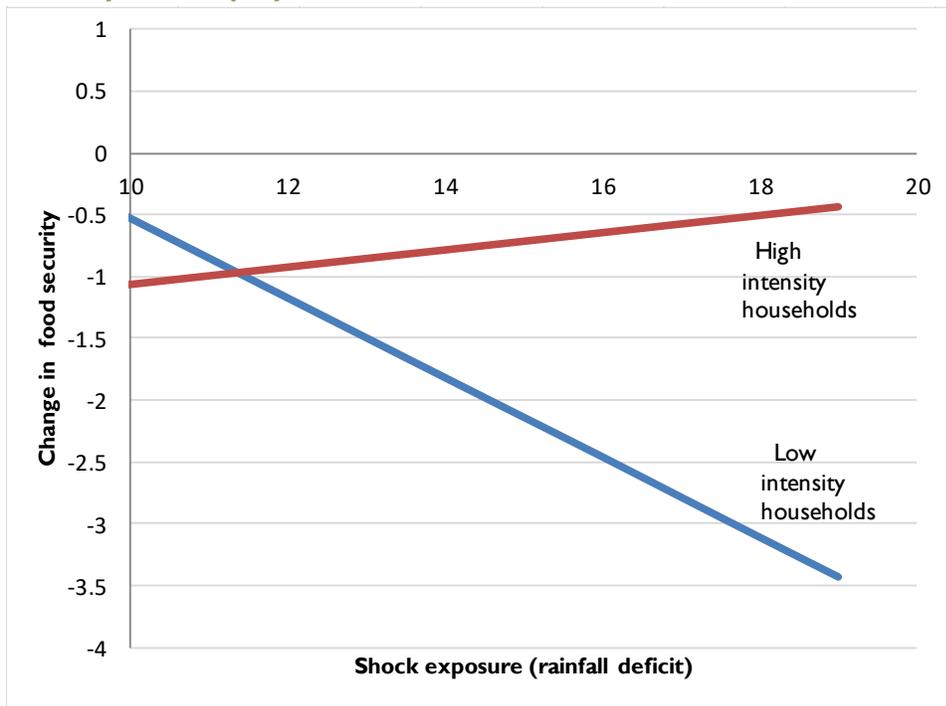
$$\frac{\partial R}{\partial SE} = -0.322 + 0.392 * HI.$$

**Table 16: Has the PRIME project enhanced households' resilience to drought?
Food security growth regression results**

Independent variable	Basic model		With drought exposure interaction	
	Coefficient	t-stat	Coefficient	t-stat
Intervention intensity (High=1)	0.509	1.15	-4.451	-2.19 **
Shock exposure	-0.062	-0.78	-0.322	-2.70 ***
Shock exposure*Intervention intensity			0.392	2.55 **
Initial food security	-0.933	-20.4 ***	-0.942	-20.3 ***
Household size	-0.028	-0.21	-0.043	-0.33
Percent females 0-16 a/				
Females 16-30	0.046	2.18 **	0.047	2.18 **
Females 30 plus	0.032	1.47	0.031	1.46
Males 0-16	-0.001	-0.11	-0.004	-0.28
Males 16-30	-0.029	-1.26	-0.033	-1.44
Males 30 plus	-0.040	-1.30	-0.041	-1.34
Female-adult-only hh	-0.483	-0.47	-0.537	-0.54
Education: None a/				
Primary	1.587	3.59 ***	1.474	3.36 ***
Secondary	2.771	4.06 ***	2.849	4.15 ***
Pastoralist a/				
Agro-pastoralist	0.491	0.94	0.500	0.97
Non-pastoralist	0.230	0.37	0.113	0.18
Asset index	1.112	4.70 ***	1.098	4.47 ***
Project area: Borena a/	-5.745	-8.84 ***	-5.241	-7.91 ***
R-squared		0.509		0.517
Number of observations		400		400
Notes: The dependent variable is the total change in food security between RMS-2 Rounds 1 and 6. Shock exposure is measured as the cumulative rainfall deficit between July 2015 and October 2016.				
Stars indicate statistical significance at the 10%(*), 5%(**), and 1%(***) levels.				
a/ Reference category.				

Shock exposure reduces resilience (ability to recover) for households in the LI group (when HI=0), but not for households in the HI group (HI=1). The relationship is illustrated in Figure 16, which shows a hypothetical scenario in which shock exposure progressively intensifies. Under these conditions the HI households maintain or increase their food security while the LI households experience an increasingly reduced ability to recover.

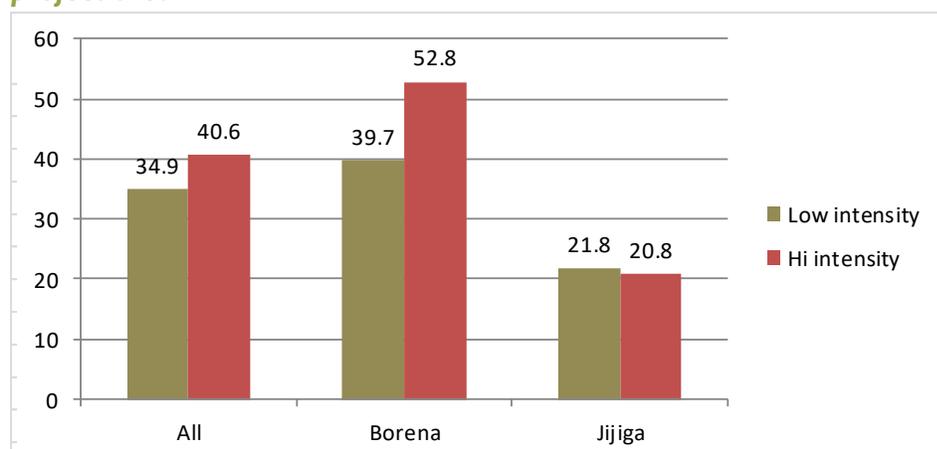
Figure 16: Estimated recovery trajectory as shock exposure increases for low- and high-intensity PRIME project households



6.1.2 Positive Deviant Probit Regressions

Does exposure to PRIME interventions help explain resilience positive deviance, that is, some households' extraordinary ability to recover from the drought? As background to answering this question, Figure 17 reports the percentage of positive deviants (PD) among LI and HI households. While the differences are not statistically significant, we find a higher concentration of PDs in the HI project areas. The overall difference is driven by a strong disparity in Borena, where a full 52.8 percent of HI households are PDs compared to only 39.7 percent of LI households.

Figure 17: Percent of positive deviants among low- and high-intensity project households, by project area



Note: Differences across the high and low-intensity groups are not statistically significant.

The probit regression results concur that the PRIME project assisted the PD households in recovering more successfully from the drought than their non-PD peers (Table 16). According to the basic model results (column A), the project increased the probability of a household being a PD regardless of their degree of drought exposure. The results including an interaction term between intervention intensity and shock exposure further imply that this effect was specifically achieved through reducing the negative impact of the drought.

Table 16: Determinants of resilience positive deviance (Is PRIME intervention intensity a determinant?): probit regression results

Independent variable	Basic model (A)		With drought exposure interaction (B)		
	Coeff- icient	z- stat	Coeff- icient	z- stat	
Intervention intensity (High=1)	0.31	1.81 *	-2.43	-2.91 ***	***
Shock exposure	0.00	-0.04	-0.14	-2.82 ***	***
Shock exposure*Intervention intensity			0.21	3.38 ***	***
Initial food security	-0.27	-11.01 ***	-0.28	-11.07 ***	***
Household size	0.02	0.36	0.02	0.32	
Percent females 0-16 a/					
Females 16-30	0.02	2.71 ***	0.02	2.62 ***	***
Females 30 plus	0.02	2.76 ***	0.02	2.75 ***	***
Males 0-16	0.00	0.35	0.00	0.22	
Males 16-30	-0.01	-1.13	-0.01	-1.33	
Males 30 plus	-0.01	-0.52	-0.01	-0.62	
Female-adult-only hh	-0.34	-0.81	-0.40	-0.95	
Education: None a/					
Primary	0.31	1.74 *	0.25	1.35	
Secondary	0.61	2.06 **	0.70	2.29 **	**
Pastoralist a/					
Agro-pastoralist	0.05	0.25	0.03	0.13	
Non-pastoralist	0.01	0.05	-0.01	-0.05	
Asset index	0.29	2.75 ***	0.30	2.65 ***	***
Project area: Borena a/	-1.76	-5.89 ***	-1.52	-4.89 ***	***
Prob > chi2		0.000		0.000	
Number of observations		400		400	
Notes: The dependent variable is a dummy variable indicating whether or not each household is a resilience positive deviant. Shock exposure is measured as the cumulative rainfall deficit between July 2015 and October 2016.					
Stars indicate statistical significance at the 10%(*), 5%(**), and 1%(***) levels.					
a/ Reference category.					

6.1.3 Has the PRIME Project Helped Prevent Unplanned Livestock Deaths?

The data collected in RMS-2 allow us to look specifically at one pathway through which the project may have helped households in their recovery from the drought: preventing unplanned livestock deaths. To do so we employ the round-stacked data set and probit regression where the dependent variable is a dummy variable for whether or not each household experienced an unplanned death of cattle, sheep and goats (Table 17). The results suggest that PRIME interventions indeed reduced the probability of such deaths in the face of shock exposure, although those for sheep are not statistically significant. They are illustrated in Figure 18, which show that for cattle and goats increased shock exposure is associated with increased probability of unplanned deaths for LI households but *reduced* probability for HI households. These results suggest that the PRIME project may have contributed to households' resilience to the drought by helping prevent unplanned livestock deaths.

Table 17: Has the PRIME project helped prevent unplanned livestock deaths?**Probit regression**

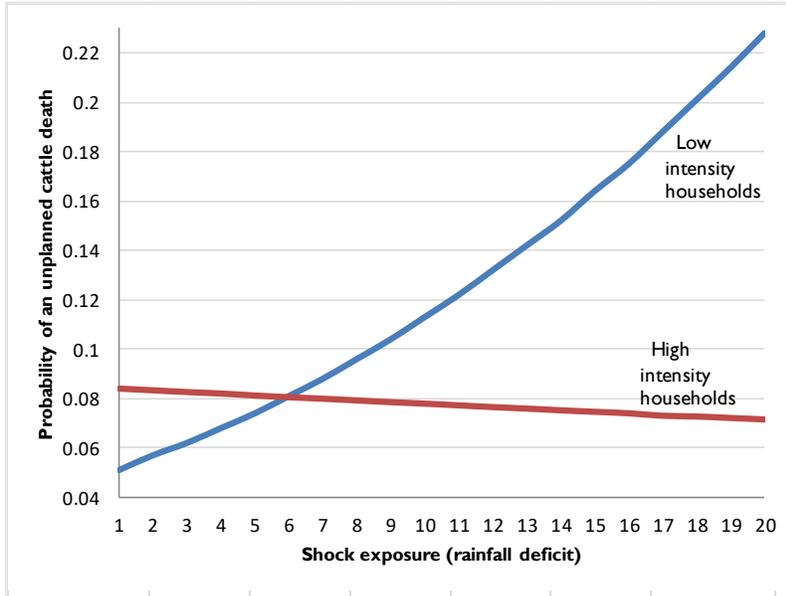
Independent variable	Cattle		Sheep		Goats	
	Coeff- icient	z- stat	Coeff- icient	z- stat	Coeff- icient	z- stat
Intervention intensity (High=1)	0.303	1.63	0.279	1.82 *	0.361	2.48 **
Shock exposure	0.047	1.74 *	0.024	1.03	0.038	1.77 *
Shock exposure*Intervention intensity	-0.051	-1.89 *	-0.034	-1.61	-0.060	-2.91 ***
Household size	-0.064	-2.4 **	-0.014	-0.6	-0.022	-0.95
Percent females 0-16 a/						
Females 16-30	-0.001	-0.22	-0.001	-0.17	0.001	0.15
Females 30 plus	-0.001	-0.18	-0.004	-0.79	0.004	1.07
Males 0-16	-0.001	-0.27	0.007	2.64 ***	0.007	3.13 ***
Males 16-30	-0.001	-0.34	0.008	1.85 *	0.006	1.51
Males 30 plus	-0.010	-1.75 *	0.005	0.83	0.006	1.08
Female-adult-only hh	-0.537	-2.08 **	0.311	1.37	-0.046	-0.21
Education: None a/						
Primary	0.145	1.48	-0.040	-0.45	0.002	0.03
Secondary	0.007	0.04	-0.101	-0.63	-0.120	-0.82
Pastoralist a/						
Agro-pastoralist	-0.070	-0.66	0.006	0.07	-0.059	-0.68
Non-pastoralist	-0.321	-2.26 **	-0.335	-2.6 ***	-0.322	-2.78 ***
Asset index (Round 1)	0.134	2.69 ***	0.126	2.76 ***	0.079	1.84 *
Project area: Borena a/	-0.306	-2.59 ***	0.096	0.95	0.222	2.29 **
Round: One a/						
Two	-0.283	-1.88 *	0.089	0.66	-0.273	-2.22 **
Three	-0.283	-1.88 *	0.195	1.41	-0.233	-1.83 *
Four	0.149	1.03	0.291	2.02 **	0.175	1.34
Five	-0.236	-1.33	0.098	0.58	-0.292	-1.89 *
Six	-0.573	-2.34 **	-0.090	-0.39	-0.482	-2.33 **
Prob > chi2		0.001		0.002		0.000
Number of observations		1,777		1,166		1,432

Notes: The dependent variables are dummy variables indicating whether a household currently owning each type of livestock experienced an unplanned death of that livestock in the two months prior to the administration of the survey. Shock exposure is measured as the cumulative rainfall deficit between July 2015 and the time of the survey's administration for each round. Stars indicate statistical significance at the 10%(*), 5%(**), and 1%(***) levels.

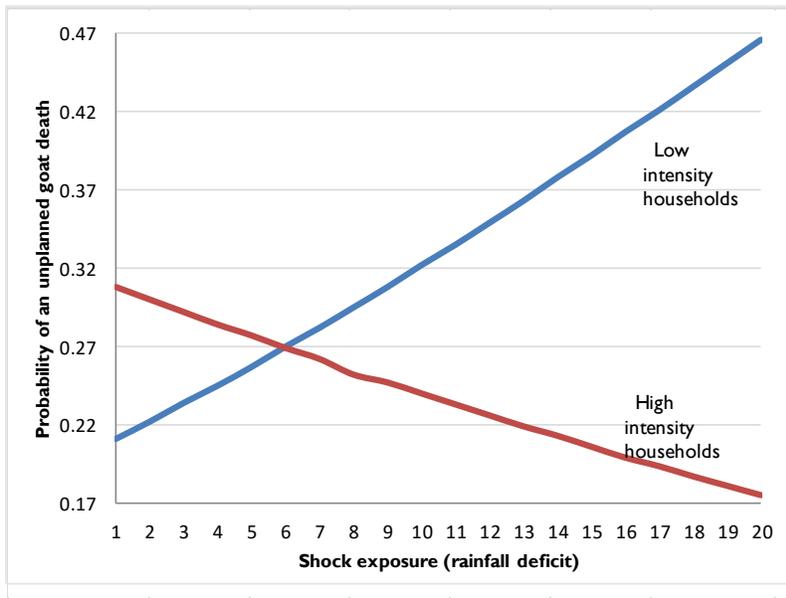
a/ Reference category.

Figure 18: Predicted probability of unplanned cattle and goat deaths as shock exposure increases for low- and high-intensity PRIME project households

Cattle:



Goats:



6.2 Impacts of PRIME Interventions on Household Coping Strategies

Understanding how PRIME interventions affect households' coping strategies can give some insight into additional means through which its positive impacts came about. Table 18 reports on the probit regression results for coping strategies. They suggest that PRIME interventions may have reduced households' reliance on borrowing money from money lenders and increased borrowing from friends and relatives, an option likely to have less negative consequences in terms of future indebtedness. They also suggest that the project reduced the need for households to rely on help with food or money from non-family members. With regard to labor patterns, PRIME interventions likely reduced the need for households to turn to new wage labor and FFW/CFW in order to cope with the drought. The finding that the project led more households to cope by increasing consumption of seed stock may be simply because households in kebeles with greater exposure to the project's intervention have greater seed stock reserves to resort to.

Table 18: Association between PRIME project intervention intensity and households' use of coping strategies: probit regression results

	Reduce food consumption	Sell or consume productive assets		Change labor patterns			Financial strategies				Receive food or financial assistance		
		Sell/ slaughter livestock	Consume seed stock	New wage labor	Increase child labor	Food/ cash for work	Borrow: friends/ relatives	Borrow: money lender	Buy food on credit	Draw down on savings	Food aid	Help: family	Help: non-family
Intervention intensity a/	0.39	-0.28	-0.96	0.71	-0.54	1.40	-0.83	3.27	-0.23	-0.74	0.18	-0.48	1.1
Shock exposure	0.07	-0.05	-0.06	0.04	-0.06	0.10	-0.04	0.03	-0.02	-0.03	0.05	-0.04	0.0
Interaction	-0.04	0.01	0.08	-0.06	0.03	-0.11	0.05	-0.26	0.01	0.04	-0.02	0.04	-0.0

Note: Shaded cells indicate coefficient is statistically significant at least at the five percent level.

The number of observations is 2,079 with the following exceptions: "Food/cash-for-work" (N=1,258) and "Borrow: money lender" (N=1,045), both lower due to lack of variation within dependent variable categories; and "Draw down savings" (N=1,370), which is lower because data were only collected in Rounds 3-6.

a/ High intensity=1, Low intensity=0.

6.3 Summary: Drought Recovery: The Role of PRIME Project Interventions

A full impact evaluation of the PRIME project employing advanced evaluation techniques will be undertaken following the collection of endline data in late 2017. Meanwhile, this chapter investigated whether the project's activities up to and including the RMS-2 period have served to enhance households' resilience to drought. Regression analyses confirm that drought exposure had a negative effect on households' ability to recover from drought. They indicate that the PRIME project's interventions to date have served to reduce that negative effect and that thus the project has indeed had a positive effect on households' resilience. Further analysis shows that one of the pathways through which the positive effect may have been brought about was reducing unplanned deaths of cattle and goats. With respect to coping strategies, the analysis suggests that the project reduced households' reliance on borrowing from money lenders and reliance on non-family members for help with food and money. In turn, it increased borrowing from friends and relatives, an option likely to have less negative consequences for future indebtedness. With regard to labor patterns, the analysis indicates that PRIME interventions reduced the need for households to turn to new wage labor and food-for-work or cash-for-work in order to cope with the drought.

7. DROUGHT RECOVERY: THE ROLE OF HUMANITARIAN ASSISTANCE

The 2015/16 El Niño drought episode led to a record level of humanitarian needs. Over one-third of Ethiopia’s woredas were officially classified as experiencing a food security and nutrition crisis. In response, the Ethiopian Government and international donors together provided 10.2 million people with food assistance, including to children through the School Feeding Program, and rolled out the largest emergency seed response ever. In addition to cash assistance and clean water provisioning, the response included treatment of over 2,321,000 children for acute malnutrition (GOE and OCHA 2017; OCHA 2017). According to a report from the Government of Ethiopia and OCHA, “The combined Government and partners’ effort helped save countless people’s lives and averted a major humanitarian catastrophe in the country” (p. 1, GOE and OCHA 2017).

Taking into account the positive effect that PRIME project interventions likely had (see Chapter 6), this chapter looks at whether the considerable humanitarian assistance received by households during the drought helped in their recovery as well. Specifically, after assessing levels of humanitarian response in the PRIME IE area, we investigate whether the three most common types of assistance—food aid, food/cash-for-work, and cash assistance—served to enhance households’ resilience to the drought.

7.1 Humanitarian Response to the Drought in the PRIME IE Area

The percent of households in the PRIME IE area receiving six different types of humanitarian assistance is reported in Table 19. The most common type was food aid, received by 81 percent of households. Receipt of food aid was almost universal in Jijiga and reached 75 percent of households in Borena. It was highest among non-pastoralists (which are most highly concentrated in Jijiga) and lowest among pastoralists.

Table 19: Percent of households receiving various types of humanitarian assistance over the RMS-2 period, by project area and pastoralist status

Type of assistance	All	Project area		Pastoralist status		
		Borena	Jijiga	Pastoralist	Agro-pastoralist	Non-pastoralist
Food aid	80.8	74.7	94.5	77.7	80.1	88.5
Food-for-work or cash-for-work	53.1	49.1	68.7	51.3	51.9	60.1
Cash	28.7	19.4	65.6	18.4	37.0	43.0
Access to drinking water	14.3	15.0	11.4	11.8	16.1	17.9
Feed or fodder for animals	7.0	6.9	7.3	3.7	11.8	7.6
Access to water for animals	2.9	2.8	3.5	1.1	3.9	6.4

The second most common type of humanitarian assistance in the IE area was food-for-work or cash-for-work (FFW/CFW), received by just over 50 percent of all households. Again, this form of assistance was more prevalent in Jijiga and among non-pastoralists. Cash assistance was received by nearly 30 percent of households and was far more prevalent in Jijiga. The other recorded types of assistance—feed or fodder for animals and access to drinking water for people and animals—were relatively rare.

As can be seen in Table 20, receipts of the three most common types of assistance varied substantially across the RMS-2 rounds. In Borena, food aid coverage rose slowly across Rounds 1 through 3 and spiked near 60 percent in Round 4. By Round 6 it had dropped to 36 percent despite the fact that at this time (September-November 2016) the autumn rains were failing. The same pattern is found for both FFW/CFW and cash assistance. In Jijiga, food assistance rose almost steadily across the rounds, consistent with the failure of three consecutive rainy seasons. The prevalence of FFW/CFW fluctuated across the rounds, and cash assistance remained low up to Round 6, where it shot up to near 60 percent of all households.

Table 20: Percent of households receiving various types of humanitarian assistance across the RMS-2 rounds, by project area

	RMS-2 rounds (Two-month recall)					
	1 Oct- Nov 2015	2 Dec 2015- Jan 2016	3 Feb- March 2016	4 April- June 2016	5 July- August 2016	6 Sept.- Nov. 2016
Borena						
Food aid	8.4	15.5	22.3	59.1	55.5	36.3
Food-for-work or cash-for-work	6.2	4.1	8.8	34.6	27.1	9.6
Cash	5.4	1.0	1.6	8.9	5.1	2.2
Jijiga						
Food aid	18.0	27.7	34.4	72.3	69.7	79.0
Food-for-work or cash-for-work	9.2	8.5	5.3	43.1	8.9	31.1
Cash	12.3	0.0	0.0	0.0	4.4	57.8

7.2 Evidence on the Impact of Humanitarian Assistance

Did this assistance help households in their recovery from the drought? Similar to the analysis of the impact of PRIME interventions in Chapter 6, this question is investigated using standard growth regression and positive deviance probit regression.

Here again the two regression methods as applied in this study do not account for the possibility of selection bias in coefficient estimates. Such bias could occur due to purposeful targeting of households expected to be less able to recover from shocks or to those households being more likely to be chosen to receive assistance. In both cases, impact estimates could be biased downwards, increasing the chance that no positive impact would be found when in fact there was one. In Table 21, which compares the resilience capacities of the receivers and non-receivers of the three most common forms of assistance, we find that in fact the receivers tended to have lower resilience capacities and thus may have started out with lower resilience potential before the onset of the drought. Thus, readers should keep in mind that any positive impact of humanitarian assistance indicated by the regression results of this chapter are understated (biased downwards). Regressions involving FFW/CFW and cash assistance are likely to be more vulnerable to this type of bias as, from examination of the data, they appear to have been more carefully targeted to individual households rather than wider geographical areas.

Other differences across the receiver and non-receiver groups are that receivers are likely to be poorer and less educated, and less likely to be pastoralists. These differences are directly controlled for in the regression analyses.

Table 21: Comparison of initial characteristics of humanitarian assistance receivers versus non-receivers

Measure	Food aid			Cash			Food/cash-for-work		
	No	Yes	Difference	No	Yes	Difference	No	Yes	Difference
Resilience capacity									
Absorptive capacity	67.8	59.0	-8.8 ***	66.4	55.4	-11.0 ***	66.8	60.1	-6.7 **
Adaptive capacity	55.3	46.3	-9.0 **	53.3	44.4	-8.9 ***	54.6	47.4	-7.2 **
Transformative capacity	54.3	47.5	-6.8	53.3	46.0	-7.3 ***	54.1	48.7	-5.4 **
Economic status									
Asset index (mean)	2.04	1.39	-0.7 **	1.71	1.27	-0.4 ***	1.8	1.4	-0.4
Food security									
Food security index (inverse of HFIAS)	17.0	16.9	-0.1	15.9	16.8	0.9	15.8	16.5	0.7
Shock exposure (in 5 years before Round 1)									
Cumulative rainfall deficit	28.0	29.4	1.4	29.3	28.4	-0.9	28.9	29.2	0.3
Demographic characteristics									
Household size (mean)	5.8	5.6	-0.2	5.6	5.8	0.2	5.6	5.8	0.2
Female adult-only household (percent)	7.3	9.8	2.5	7.1	7.8	0.7	7.2	7.4	0.2
Education (percent)									
None	17.4	40.2	22.8 ***	30.3	37.4	7.1	31.3	33.1	1.8
Primary	70.8	49.7	-21.1 ***	57.3	55.0	-2.3	56.9	56.4	-0.5
Secondary	11.9	10.0	-1.9	12.5	7.6	-4.9	11.7	10.5	-1.2
Pastoralist Status (percent)									
Pastoralist	52.8	43.8	-9.0 *	57.4	53.0	-4.4 ***	52.0	48.5	-3.5
Agro-pastoralist	34.7	33.2	-1.5	28.5	41.5	13.0	33.0	31.5	-1.5
Non-pastoralist	12.5	22.9	10.4	14.1	26.4	12.3 ***	15.0	20.0	5.0

Note: Stars indicate statistical significance at the 10%(*), 5%(**), and 1%(***) levels.

7.2.1 Standard Growth Regressions

The growth regression results are presented in **Error! Reference source not found.**

Regressions were run for the basic model and models including an interaction term between the humanitarian assistance variable and shock exposure. They were further broken down into 1) all households; 2) Borena households; and 3) Jijiga households, giving a total of 18 regressions. Region-specific results are only reported in the table if the humanitarian assistance variable has a statistically significant coefficient.

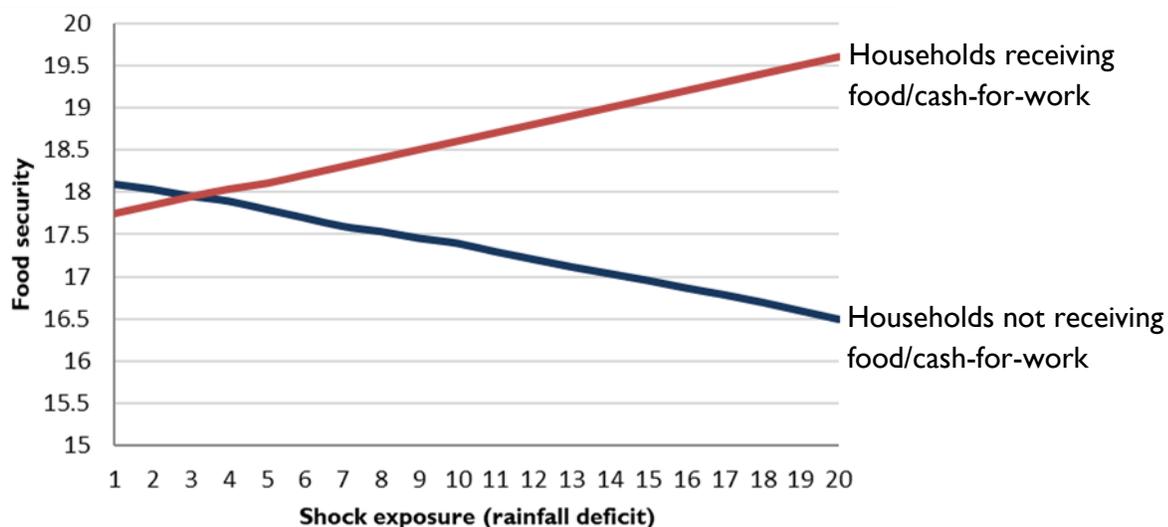
Food aid

Starting with food aid, the results suggest that when considering the PRIME IE population as a whole, this widespread form of assistance had a positive impact on households' ability to recover from the drought ($t=1.99$). This result holds even in the face of the possible negative selection bias discussed above. The impact appears to be even stronger for Borena (a coefficient of 1.41 versus 1.14 for the wider population). The impact for Jijiga is moderated by shock exposure: the results indicate that the negative impact of exposure to the drought is reduced for households that receive food aid.

Food/Cash-for-Work

Turning to food/cash-for-work, these regressions for which the change in food security is the dependent variable indicate a weak positive impact of assistance on food security recovery ($t=1.74$). When the far-larger round-stacked data set is used to examine the effect of FFW/CFW on the *level* of food security (results not shown), we find robust evidence that this form of assistance served to reduce the negative impact of the drought on households' food security in both Borena and Jijiga, which is confirmation of its resilience-enhancing effects. The result for the IE population as a whole is illustrated in Figure 19, which shows the regression model's predicted food security path as shock exposure increases. The receivers of FFW/CFW experience an increase in their food security despite increasing shock exposure while the non-receiver households experience a decline.

Figure 19: Estimated food security trajectory as shock exposure increases for food/cash-for-work receivers and non-receivers



Cash Assistance

The regressions for cash assistance show no positive impacts on either households' resilience to the drought (**Error! Reference source not found.**, next page) or their food security (results not shown). Since the regression coefficient could be biased downwards due to selection bias (perhaps because cash assistance was particularly well targeted to households in greater need), we have no way of knowing from this analysis whether or not it had a positive influence.

Table 22: Did humanitarian assistance increase households' resilience to drought? Food security growth regression results

Independent variable	Food aid						Food/cash-for-work		Cash	
	Basic model				With drought exposure interaction		Basic model		Basic model	
	All		Borena		Jijiga		Coeff- icient	t- stat	Coeff- icient	t- stat
	Coeff- icient	t- stat	Coeff- icient	t- stat	Coeff- icient	t- stat				
Humanitarian assistance	1.139	1.99 **	1.409	2.56 **	-16.013	-4.93 ***	0.925	1.74 *	-0.972	-1.38
Shock exposure*assistance					0.980	4.25 ***				
Intervention intensity (High=1)	-5.005	-2.4 **	1.393	0.18	-10.191	-1.59	-0.447	-0.16	0.721	0.26
Shock exposure	-0.354	-2.91 ***	-0.23	-1.64	-1.640	-2.52 **	-0.179	-1.27	-0.142	-1.06
Shock exposure*Interv't'n intensity	0.442	2.79 ***	0.024	0.04	0.844	1.40	0.082	0.38	-0.011	-0.05
Initial food security	-0.929	-19.3 ***	-0.95	-16.8 ***	-0.843	-8.72 ***	-0.933	-16.8 ***	-0.945	-17 ***
Household size	-0.056	-0.42	-0.02	-0.14	-0.012	-0.05	-0.132	-0.81	-0.124	-0.77
Percent females 0-16 a/										
Females 16-30	0.044	2.01 **	0.04	1.6	0.040	0.98	0.047	1.73 *	0.046	1.75 *
Females 30 plus	0.032	1.48	0.058	2.51 **	0.013	0.36	0.027	1.05	0.022	0.85
Males 0-16	-0.002	-0.17	0.016	1.11	-0.026	-1.07	0.003	0.17	0.005	0.31
Males 16-30	-0.030	-1.28	0.024	0.92	-0.056	-1.35	-0.027	-1.08	-0.029	-1.16
Males 30 plus	-0.037	-1.18	0.059	1.73	-0.074	-1.57	-0.004	-0.12	-0.003	-0.09
Female-adult-only hh	-0.512	-0.51	0.454	0.39 *	-0.874	-0.43	-0.297	-0.2	-0.151	-0.1
Education: None a/										
Primary	1.575	3.55 ***	1.087	1.85 *	1.749	2.60 ***	1.342	2.33 **	1.429	2.46 **
Secondary	2.877	4.35 ***	2.061	2.62 ***	4.057	3.12 ***	3.117	3.73 ***	3.109	3.68 ***
Pastoralist a/										
Agro-pastoralist	0.545	1.06	0.526	0.93	1.313	1.28	0.122	0.2	0.090	0.15
Non-pastoralist	0.110	0.18	-0.44	-0.44	0.785	0.69	-0.044	-0.05	0.087	0.1
Asset index	1.188	4.82 ***	1.299	5.23 ***	0.750	0.90	1.405	6.28 ***	1.275	5.6 ***
Project area: Borena a/	-4.844	-6.62 ***					-5.885	-6.89 ***	-6.647	-7.11 ***
R-squared	0.521		0.633		0.387		0.591		0.590	
Number of observations	398		214		184		227		227	

Notes: The dependent variable is the total change in food security between RMS-2 Rounds 1 and 6. Shock exposure is measured as the cumulative rainfall deficit between July 2015 and October 2016. Stars indicate statistical significance at the 10%(*), 5%(**), and 1%(***) levels.

a/ Reference category.

7.2.2 Positive Deviant Probit Regressions

Can receipt of humanitarian assistance help explain how the PDs managed to recover so much better than other households? As background, we find that while it is not statistically significant, the percentage of PDs among food aid receivers is substantially higher (39 percent) than the percentage among non-receivers (28 percent) (Figure 20). Very little difference between receivers and non-receivers can be detected in the case of FFW/CFW and cash assistance.

Figure 20: Percentage of positive deviants among humanitarian assistance receivers and non-receivers



Note: Differences across the high and low-intensity groups are not statistically significant.

The probit regression results in Table 23 suggest that receipt of food aid in Borena ($p=2.54$) and participation in FFW/CFW in Jijiga ($p=2.66$) did indeed play a role in the extraordinary ability of PD households to recover. Given the potential of downward bias, no conclusions regarding the results indicating statistically insignificant coefficients on food aid in Jijiga, on FFW/CFW in Borena, and a negative coefficient on cash assistance in Jijiga can be drawn.

Table 23: Is humanitarian assistance a determinant of resilience positive deviance?: probit regression results

Independent variable	Food aid						Food/cash-for-work						Cash					
	All		Borena		Jijiga		All		Borena		Jijiga		All		Borena		Jijiga	
	Coeff- icient	z- stat	Coeff- icient	z- stat	Coeff- icient	z- stat	Coeff- icient	z- stat	Coeff- icient	z- stat	Coeff- icient	z- stat	Coeff- icient	z- stat	Coeff- icient	z- stat	Coeff- icient	z- stat
Humanitarian assistance	0.442	1.97 **	0.697	2.54 **	-0.08	-0.19	0.306	1.24	0.201	0.68	3.467	2.66 ***	-0.5	-1.57	-0.37	-0.93	-1.645	-2.5 **
Intervention intensity	-2.68	-3.17 ***	-1.31	-0.49	-2.21	-1.08	-2.44	-1.8 *	-1.76	-0.44	-5.62	-0.93	-1.67	-1.31	-1.53	-0.39	-5.614	-1.10
Shock exposure	-0.15	-3.04 ***	-0.14	-2.01 **	-0.09	-0.48	-0.12	-1.6	-0.09	-1.08	-0.05	-0.09	-0.11	-1.63	-0.08	-0.99	-0.508	-1.11
Shock exposure*Intensity	0.233	3.64 ***	0.154	0.77	0.17	0.91	0.203	1.98 **	0.161	0.54	0.418	0.76	0.143	1.5	0.145	0.49	0.457	0.97
Initial food security	-0.28	-10.8 ***	-0.33	-7.22 ***	-0.24	-6.66 ***	-0.35	-8.03 ***	-0.35	-6.57 ***	-1.22	-2.86 ***	-0.36	-8.49 ***	-0.36	-6.68 ***	-0.542	-4.57 **
Household size	0.013	0.26	0.051	0.78	-0.03	-0.33	-0.04	-0.61	0.05	0.59	-1.85	-3.22 ***	-0.05	-0.74	0.038	0.42	c/	
Percent females 0-16 a/																		
Females 16-30	0.021	2.52 **	0.019	1.76 *	0.03	1.8 *	0.026	2.15 **	0.027	1.88 *	0.062	0.83	0.022	1.79 *	0.023	1.59	0.077	1.64 *
Females 30 plus	0.02	2.76 ***	0.03	2.56 ***	0.02	1.98 **	0.024	1.96 **	0.036	2.33 **	-0.03	-0.43	0.02	1.62	0.032	2.12 **	-0.008	-0.19
Males 0-16	0.002	0.36	0.005	0.79	0.00	-0.36	0.011	1.54	0.013	1.61	-0.01	-0.16	0.012	1.65 *	0.013	1.65 *	-0.014	-0.67
Males 16-30	-0.01	-1.08	0.007	0.63	-0.02	-1.64	-0.01	-1.22	-0	-0.2	-0.24	-2.58 ***	-0.01	-1.3	-0.01	-0.4	-0.027	-0.96
Males 30 plus	-0	-0.39	0.024	1.43	-0.03	-1.69 *	-0.01	-0.39	0.011	0.61	-0.17	-1.92 **	-0	-0.04	0.011	0.61	0.042	1.33
Female-adult-only hh	-0.39	-0.91	0.3	0.55	-1.83	-2.08 **	-0.09	-0.12	0.286	0.36	b/		0.016	0.02	0.305	0.39	b/	
Education: None a/																		
Primary	0.303	1.6	0.278	0.95	0.34	1.32	0.216	0.77	0.073	0.21	2.976	2.39 ***	0.231	0.84	0.081	0.23	1.086	1.39
Secondary	0.754	2.55 **	0.717	1.84 *	0.75	1.29	1.327	3.17 ***	0.888	1.69 *	9.732	2.89 ***	1.328	3.24 ***	0.868	1.70 *	4.131	3.23 **
Pastoralist a/																		
Agro-pastoralist	0.044	0.22	0.105	0.40	0.16	0.43	0.014	0.05	-0.16	-0.54	4.903	1.77 *	-0.02	-0.08	-0.14	-0.45	5.171	2.47 **
Non-pastoralist	0.007	0.03	-0.24	-0.53	0.09	0.21	0.179	0.43	0.019	0.03	6.33	2.03 **	0.225	0.53	0.055	0.08	6.231	2.74 *
Asset index	0.333	2.88 ***	0.448	3.16 ***	0.02	0.06	0.558	4.36 ***	0.58	4.29 ***	1.939	1.49	0.523	4.14 ***	0.566	4.29 ***	0.285	0.41
Project area: Borena a/	-1.39	-4.38 ***											-2.44	-4.66 ***				
Prob > chi2		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000
Number of observations		398		214		184		227		153		72		227		153		72

Notes: The dependent variable is a dummy variable indicating whether or not each household is a resilience positive deviant. Shock exposure is measured as the cumulative rainfall deficit between July 2015 and October 2016.

Stars indicate statistical significance at the 10%(*), 5%(**), and 1%(***) levels.

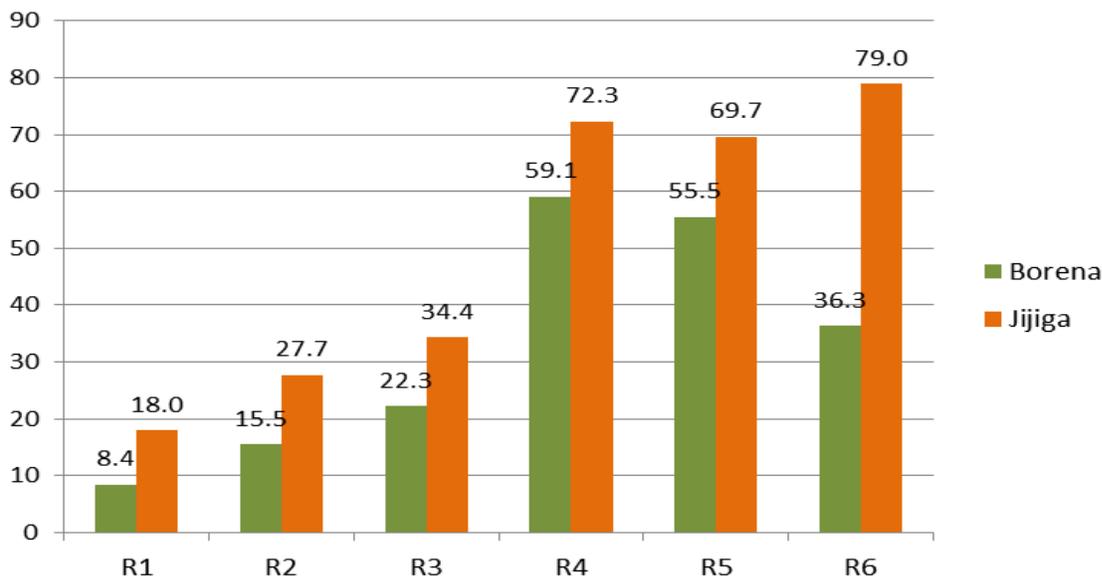
a/ Reference category; b/ Variable omitted due to lack of sufficient variation; c/ Variable omitted because of lack of model convergence when included.

7.2.3 Did the Timing of Food Aid Matter?

Early timing of humanitarian assistance is critical for saving lives, livelihoods, and financial resources for development (Cabot Venton 2016). This section asks whether the timing of receipts of food aid mattered for the degree of households' resilience to the drought. Note that the analysis could not be conducted for the other forms of humanitarian assistance because of missing data.²⁹

Figure 21 details the percentage of households receiving food aid in each RMS-2 round. In Jijiga, there was a more or less continuous increase in the percentage of households receiving food aid across all rounds of data collection, although there was a slight dip at Round 5. In Borena, food aid receipts peaked at Round 4 and dropped thereafter. Thus, at the end of the RMS-2 data collection, more than three-fourths of households in Jijiga were receiving food aid, while only about one-third were in Borena.

Figure 21: Percentage of households receiving food aid, by RMS-2 round



For those households who received food aid, Figure 22 specifies the percentage receiving it for the first time in each round. In both project areas, large percentages of households did not begin receiving food aid until the last three rounds of data collection (starting in April-May-June 2016), when drought conditions had manifested themselves more fully.

²⁹ Partly because of the targeting of these types of assistance to individual households rather than entire villages, a full series, covering all six RMS-2 rounds, could not be constructed for a sufficient number of households to conduct the analysis.

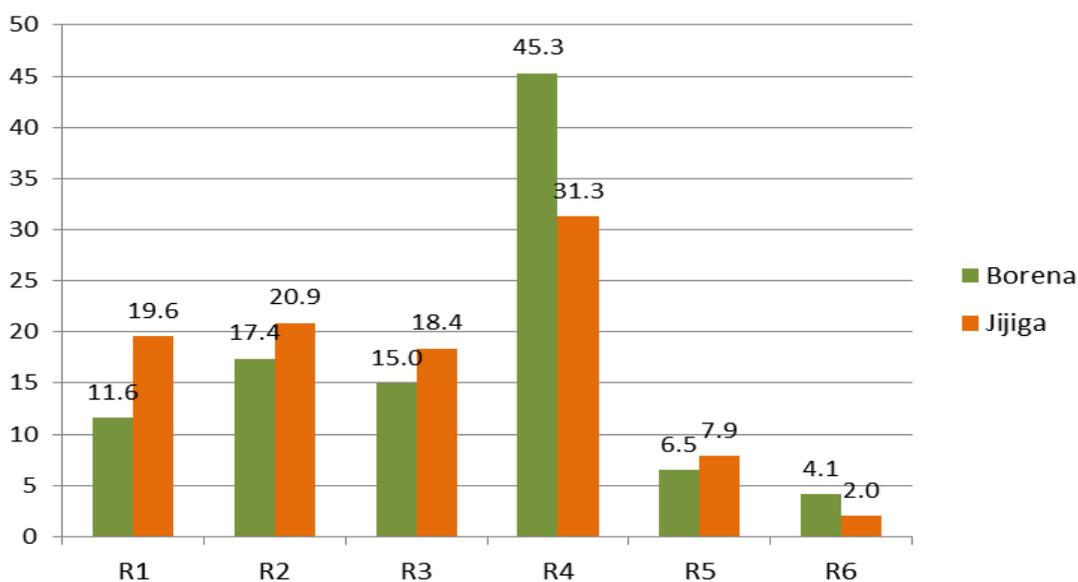
Figure 22: Percentage of households first receiving food aid in each RMS-2 round

Table 24 presents the results of regression analyses examining whether early receipt of food aid mattered for households' resilience to the drought, with results broken down by project area. First examined is whether receiving food aid for the first time in Rounds 1 or 2 (30 percent of sample households), controlling for whether it was received at all over the RMS-2 period, made a difference (Panel A). Here we find some evidence, albeit weak (possibly due to the sample size issue), that early receipt had a positive impact on households' resilience in Borena ($t=1.69$), but not in Jijiga. This finding is confirmed when the round in which food aid was first received is employed as a dependent variable (with higher values signaling earlier receipt) (see Panel B).

Table 24: Did early timing of humanitarian assistance matter for households' resilience to the drought? Food security growth regression results

Independent variable	All		Borena		Jijiga	
	Coeff- icient	t- stat	Coeff- icient	t- stat	Coeff- icient	t- stat
(A) Early receipt of food aid (in first two RMS-2 rounds)						
Food aid	1.063	1.83 *	1.12	1.93 *	-0.01	-0.01
Early receipt	0.471	0.95	1.18	1.69 *	0.02	0.03
Shock exposure	-0.39	-3.31 ***	-0.26	-1.79 *	-0.90	-1.57
(B) Timing of first receipt of food aid						
Food aid	0.503	0.59	-0.11	-0.11	-0.11	-0.05
Round in which first received a/	0.183	1.08	0.41	1.79 *	0.03	0.12
Shock exposure	-0.39	-3.22 ***	-0.25	1.74 *	-0.81	-1.32
(C) Timing interacted with shock exposure						
Food aid	0.343	0.4	-0.05	-0.05	-2.05	-0.93
Round in which first received	-0.53	-0.88	0.227	0.19	-1.26	-1.74 *
Shock exposure	-0.56	-3.12 ***	-0.3	-1.00	-1.23	-1.85 *
Round first received*shock exposure	0.055	1.24	0.013	0.16	0.11	1.87 *

Note: The dependent variable is the change in food security between RMS-2 rounds 1 and 6.

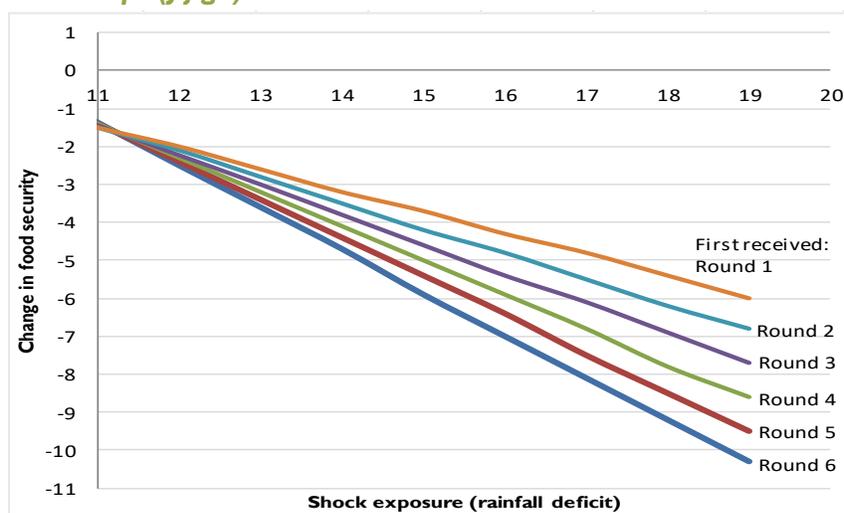
Stars indicate statistical significance at the 10%(*), 5%(**), and 1%(***) levels.

a/ This variable ranges from 0 to 6 and is higher the earlier food aid was first received.

While the above findings imply that early receipt mattered in Borena *regardless of the degree of shock exposure*, for Jijiga, we find that it specifically served to prevent the negative impact of shock exposure. As illustrated in

Figure 23, the earlier a household in Jijiga received food aid, the less precipitously its food security appears to have deteriorated as shock exposure increased.

Figure 23: Estimated resilience trajectory as shock exposure increased, by timing of first food aid receipt (Jijiga)



7.3 Impacts of Humanitarian Assistance on Household Coping Strategies

The regression results examining the impact of food aid and FFW/CFW (the assistance modalities showing a positive association with households' resilience; see **Error! Reference source not found.**), on households' coping strategies are presented in Table 25. The results confirm the role of food aid in bolstering households' food consumption: food aid is associated with less use of the coping strategy "reduce food consumption." Both aid modalities appear to have reduced households' reliance on a number of strategies for coping with the drought.

Households receiving food aid were less likely to:

- Consume seed stock
- Draw down on savings
- Rely on help from family members.

Households engaging in FFW/CFW were less likely to:

- Sell or slaughter livestock
- Consume seed stock
- Borrow money from a friend or relative
- Buy food on credit
- Draw down on savings
- Rely on help from family members

Table 25: Association between humanitarian assistance and households' use of coping strategies: probit regression results

	Reduce food consumption	Sell or consume productive assets		Change labor patterns			Financial strategies				Receive food or financial assistance	
		Sell/ slaughter livestock	Consume seed stock	New wage labor	Increase child labor	Food/ cash for work	Borrow: friends/ relatives	Borrow: money lender	Buy food on credit	Draw down on savings	Food aid	Help: family
Food aid	-0.210	0.084	-0.378	0.161	0.210	0.044	-0.087	-0.420	0.108	-0.358	0.876	-0.236
Food/cash-for-work	0.161	-0.304	-0.463	0.074	0.232	0.648	-0.351	-0.516	-0.484	-0.418	2.26	-0.307

Note: Shaded cells indicate coefficient is statistically significant at least at the five percent level.

The number of observations is 2,080 with the following exceptions: "Food/cash-for-work" (N=1,258) and "Borrow: money lender" (N=1,046), both lower due to lack of variation within dependent variable categories; and "Draw down on savings" (N=1,271) lower because data were only collected in Rounds 3-6.

7.4 Qualitative Data on Humanitarian Assistance

Insights from the qualitative data regarding formal assistance to help communities deal with the drought (e.g., food aid) are somewhat mixed. In large part this is due to “overlap” of formal assistance in general (e.g., NGO or government development initiatives) with additional efforts specifically in response to the drought (e.g., humanitarian assistance). KIs in Jijiga, most all of whom were kebele administration officials, were quite specific about who provides what type of development and humanitarian (e.g., drought-related) support, at least when support is provided. However, they also tend to agree that neither is sufficient relative to the need. As one KI in Jijiga indicated, *“Even lack of government support has made us to organize our own support to withstand those bad times. We don’t wait anymore; we don’t expect that government or NGOs will help us.”* In contrast, with only one or two exceptions, most FGD participants in Jijiga indicated their communities received very little support generally, let alone to help them deal with the drought.

“Even when PSNP food is given, we share it or we agree to share more to those most affected.”

KII; Jijiga

To a fairly large degree however, food – or other – aid is considered a key coping strategy for households in most communities surveyed in Jijiga and Borena. Food assistance is provided by depending on location (e.g., WFP, Mercy Corps, the Red Cross, Save the Children, World Vision, ACF, CARE), the Productive Safety Net Program (PSNP), and government emergency food aid initiatives. Food distributions from work activities (e.g., soil conservation, check dam construction, road construction/maintenance) and direct wheat and edible oil distribution from the PSNP are especially critical in helping the most destitute households recover from shocks/stresses.

Across most villages in which qualitative data were collected in Jijiga, the PSNP is operational. Participants of one male FG noted that the PSNP had also been helping them cope with the effects of the drought and had recently switched from food aid to cash transfers (reported at the last round of data collection in November). Although the value of the cash transfer (350 birr per household member) was more than the value of the food transfer, they preferred the food transfer because they tended to spend the cash on khat, leaving their families worse off than before.

According to one women’s FG in Jijiga, the government’s PSNP food aid (30 kg of wheat per household) had ceased three months prior to Round 4 (April). At the final round of data collection (November), they indicated that water trucked in by the government had also recently stopped. Also in April (Round 4), a men’s FG in a different kebele indicated that NGO interventions in their community include *“PSNP regular food aid, a one-time 50 kg food aid from the UNHCR, a pond/birkah dug in 2005 by an unknown NGO, and ACF’s distribution of goats for 28 households.”* Women in a different kebele reported at Round 4 that the government had provided beans, wheat and oil; NGOs were providing rice and oil but only to communities near the main road (which did not include their community); and the Red Cross was promoting a women’s savings group focused on shoa fattening activities.

At Round 1, one KI in Jijiga noted that fodder was being provided by an NGO in his community. In another kebele, fodder was being provided by a wealthy member of the community who had long ago moved to town. According to one member of the FG, this person had become successful and brought a truck loaded with fodder back to his community, distributing it to the most affected households. By Round 3, one kebele had received fodder from an NGO in response to the drought, primarily to households with pregnant and milking animals. At Round 2 it was reported that Mercy Corps was providing households in some kebeles with cash for purchasing livestock.

“The [woreda] administration here doesn’t want to spend much on the community.”

KII; Jijiga

A few FGs in Jijiga expressed some concern about corruption. Participants in one female FG indicated that when NGOs responded to the drought with food aid, it was provided directly to the kebele administration office, which often sold it or gave it to relatives rather than those in need. When confronted, kebele officials distributed a small token, in this case, 50 kg of wheat to be divided by seven households and 5 liters of oil for 10 households, regardless of how many people in the household. Male FGD participants in another kebele reported at Round 4 that very little food aid reached the community because of corruption and abuse by kebele officials. In this case, bags of food aid were sold or exchanged for khat, often at the kebele office itself. According to one participant in the FGD, one kg of khat costs 450 birr, requiring three bags of grain, which sell for 150 birr each. Although of a different nature, corruption was also mentioned by a KI in March (Round 3). According to the informant, kebele officials in his kebele pushed NGOs to work in areas where their clans reside, rather than where the need is.

Members of several kebeles brought up the issue of the type and timing of assistance for helping communities deal with the drought. Members of several different kebeles in Jijiga suggested that communities hard hit by the drought needed government assistance to *“restart production using the current good amount of rainfall.”* FGD participants emphasized that the large number of oxen deaths and lack of income to pay for tractor services meant households were not able to begin farming even though there was good rainfall by that time (Rounds 3 and 4). They referred to this risk as *“green hunger”* and suggested that, *“The support to make people productive now is less costly than the effort to provide food aid, therefore the government and concerned organizations should act immediately.”*

PSNP is also widely implemented in Borena. At Round 3, several KIs indicated the program had been recently expanded in some communities. Specifically, PSNP’s cash-for-work program had more than doubled from two years prior; in one kebele it increased to 500 households from 224 previously. One KI mentioned at Round 5 that those kebeles closer to urban areas were often denied their requests for assistance because officials felt the proximity to town afforded households the opportunity to engage in trade or otherwise gain income. FGs and KIs also noted there had been improvements in implementation of the program resulting from the program’s take-over by Save the Children as implementing partner.

In Borena, FGs and KIs reported that the direct food support provided by the government and NGOs is critical for people's survival during times of drought, representing their only means of "daily subsistence." Trucked in water, animal fodder or transportation fees to other communities to purchase fodder, and ambulance services were also provided by the government during the drought, according to several FGs at Round 2. FGs in some communities noted an increase in assistance within their communities around preparing grazing lands and conserving water between Rounds 3 and 4.

"When the drought comes, every household is affected, and livestock dies, though the government is trying to provide support with animal feed/grass. Actually, the support saved the cattle last year."

FGD; Borena

KIs in Borena suggested that government assistance actually increased the deep-seated sharing traditions within communities. This is consistent with their recognition that food distributions were often the only form of daily subsistence for some people. Even at Round 1, some KIs felt that assistance created dependence for some people, and that it was increasing. At Round 5, one KI noted that many households have become aid dependent even though the amount of aid distributed is small.

According to KIs, 15 kg of wheat is provided for every household member who participates in the food-for-work safety net program. However, a number of KIs indicated that if household members are unable to work (e.g., they are children or elderly), then the household head must work for them in order to receive their 15 kg. This was reported as problematic in that it increased the workload for household heads and created tensions. Another KI in Borena indicated that the government's safety net provided 15 kg of cereal per household, regardless of the size of your family. It is unclear from the data whether this refers to situations in which household members are unable to work, or whether implementation of the program is indeed different depending on location and/or implementing partner.

7.5 Summary: Drought Recovery: The role of Humanitarian Assistance

The three most common types of humanitarian assistance received by households during the drought were food aid, food/cash-for-work, and cash assistance. This chapter found evidence that both food aid and food/cash-for-work had a positive effect on households' ability to recover from the drought. Such evidence was not found for cash assistance, but it is noted that the regression estimates for this type of assistance are likely downward biased (because of pro-active targeting to households in greater need).

Focusing specifically on food aid, the chapter looked at whether the early timing of assistance, which is thought to be critical for saving lives, livelihoods, and financial resources for longer-term development, mattered for households' recovery. The quantitative analysis found evidence of a positive impact of early receipt (beyond and above receipt of food aid at all), being particularly strong for Jijiga.

With respect to coping strategies, the humanitarian assistance received by households appears to have reduced households' reliance on a number of coping strategies, including selling or slaughtering livestock, consuming seed stock, relying on help from friends and family members, drawing down on savings, and buying food on credit. The results confirm the role of food aid, in particular, in bolstering households' food consumption: food aid is associated with less use of the coping strategy "reduce food consumption." The qualitative data confirm that, although direct food assistance provided by the government or NGOs may have been insufficient compared to need, it was critical for people's survival during the drought, representing for some their only means of daily subsistence.

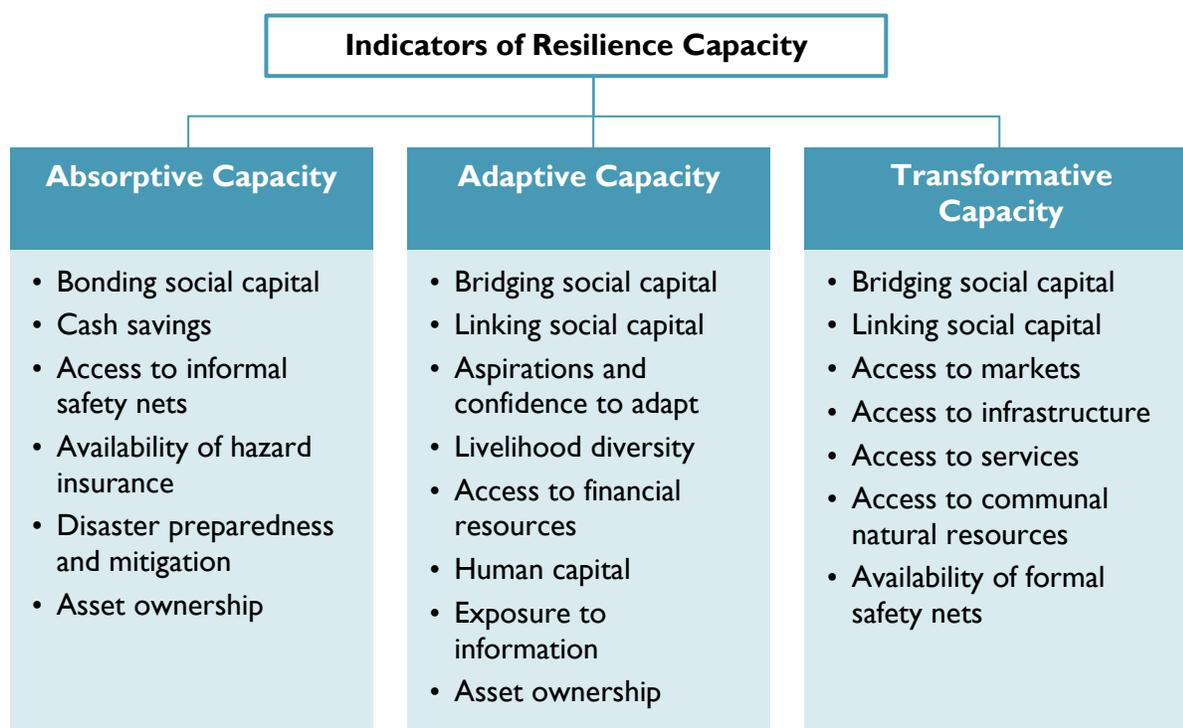
8. DROUGHT RECOVERY: THE ROLE OF HOUSEHOLDS' RESILIENCE CAPACITIES

In this final results chapter we examine the effect that households' resilience capacities had on their resilience to the drought. It is important to note at the outset that all capacities except one were measured at the time of the baseline survey, in December 2013. Thus, for these capacities any finding of a weak or non-existent relationship between a particular capacity and households' resilience should not be regarded as definitive evidence for lack of such a relationship. On the other hand, findings of a positive, statistically significant relationship are strong suggestive evidence that such a relationship actually exists. The one capacity that was measured at the time of RMS-2, and thus for which we have an updated measure, was households' asset ownership.

8.1 Indicators of Resilience Capacity

Resilience capacity is measured using indexes of absorptive capacity, adaptive capacity, and transformative capacity, as defined in Chapter I. The indexes are constructed from multiple indicators, as given in Figure 24.

Figure 24: Indicators of household resilience capacity



8.2 Resilience to the Drought: Evidence on the Impact of Households' Resilience Capacities

Table 26 reports on both the standard growth regression and positive deviance probit regression results examining which specific resilience capacities contributed to households' resilience to the drought. Note that the indices of absorptive, adaptive, and transformative capacities that are constructed based on the indicators showed no significant effects on households' resilience. This is driven by the fact that many of the index components (the indicators making up the index) were not statistically significant, which is likely because these capacities were assessed at baseline and likely have eroded over time. Examining the association between resilience capacities assessed at the time of the RMS-2 would likely yield stronger results for the association between capacities and resilience.

The growth regressions indicate a positive role for the following:

- Access to informal safety nets;
- Disaster preparedness and mitigation;
- Asset ownership (at RMS-2 Round 1);
- Access to financial resources; and
- Availability of formal safety nets.

The PD probit regressions concur with the growth regressions for most of the indicators. The exceptions are that access to informal safety nets may not have helped PDs do so much better than their peers, and what may have helped them additionally were:

- Bonding social capital;
- Availability of hazard insurance; and
- Exposure to information.

We can thus conclude that, along with PRIME interventions and humanitarian assistance, households' own resilience capacities likely played a strong role in their recovery from the drought. The fact that the above-listed capacities (with the exception of asset ownership) were measured at baseline also implies that households' capacities at one point in time can continue to enable their resilience to future shocks, in this case to a shock that started two years later. Note that one indicator of *community* resilience capacity, the presence of a civic group in households' communities, also has a positive association with households' resilience.

The RMS-1 data analysis indicated that only three of these capacities were also found to have assisted households in their recovery from the 2014/15 drought episodes: Bonding social capital, access to informal safety nets, and access to financial resources. This may be due, perhaps, to the different natures of the shocks themselves and/or a different level of humanitarian assistance.

On the other hand, six capacities were found to be instrumental in households' recovery from the RMS-1 drought shock, but not that of RMS-2: holdings of savings, bridging social capital, human capital, access to markets, and access to communal natural resources. These differences may be due to the fact that their levels were measured at baseline. Updated data on the levels of households' resilience capacities will be collected as part of the endline survey.

Table 26: Which resilience capacities helped households recover from the drought? Growth regression and positive-deviance probit regression results

Independent variable	Growth regressions		Positive deviance probit regressions	
	Coefficient	t-stat	Coefficient	t-stat
Absorptive capacity				
Bonding social capital	0.001	0.13	0.006	2.12 **
Holdings of savings	-0.483	-0.83	-0.293	-1.17
Access to informal safety nets	0.432	2.31 **	0.083	0.98
Availability of hazard insurance	1.490	1.37	0.863	2.13 **
Disaster preparedness and mitigation	1.720	2.44 **	0.755	2.40 **
Asset index (RMS2 Round 1)	1.100	4.47 ***	0.296	2.65 ***
Adaptive capacity				
Bridging social capital	0.001	0.18	0.001	0.43
Linking social capital	0.001	0.06	0.007	1.13
Aspirations/confidence to adapt	-0.013	-0.87	-0.006	-1.02
Livelihood diversity	0.243	0.62	0.176	1.20
Access to financial resources	0.829	2.25 **	0.379	1.79 *
Human capital	0.143	0.22	0.108	0.37
Exposure to information	0.023	0.41	0.044	1.98 **
Asset index (RMS2 Round 1)	1.100	4.47 ***	0.296	2.65 ***
Transformative capacity				
Bridging social capital	0.001	0.18	0.001	0.43
Linking social capital	0.001	0.06	0.007	1.13
Access to markets	0.175	1.02	0.058	0.82
Access to infrastructure	0.622	1.03	0.207	0.86
Access to services	0.411	0.87	0.271	1.49
Access to communal natural resources	0.121	0.36	-0.172	-1.32
Availability of formal safety nets	1.420	3.72 ***	0.615	3.74 ***
Community resilience capacity				
No. natural resource managment groups	0.075	0.20	-0.080	-0.51
Disaster risk reduction index	-6.500	-2.67 ***	-3.450	3.03 ***
Social protection index	3.860	1.50	1.100	0.94
Presence of a civic group	1.340	2.67 ***	0.427	1.92 *
Access to communal natural resources	0.121	0.36	-0.172	-1.32

Notes: The dependent variable for the growth regressions is the total change in food security between RMS-2 Rounds 1 and 6. That for the positive deviance regressions is a dummy variable equal to 1 for the positive deviants. Shock exposure is measured as the cumulative rainfall deficit between July 2015 and October 2016. The number of observations ranges from 381 to 400.

Stars indicate statistical significance at the 10%(*), 5%(**), and 1%(***) levels.

8.3 Evidence on the Impact of Households' Resilience Capacities on Their Coping Strategies

Which coping strategies did the resilience capacities identified above prevent (or enable)? Answering this question gives some clue to how such a positive effect of the capacities was achieved. The regression results examining the association between households' resilience capacities and their coping strategies are reported in Table 27.

Five capacities stand out as being directly associated with lessening the need for households to reduce their food consumption as a coping strategy, and thus as possible enablers of households' resilience to the drought:

- Bonding social capital;
- Holdings of savings;
- Bridging social capital;
- Human capital; and
- Access to markets.

Beyond reducing food consumption, the changes in coping strategies associated with each of the RCs identified to have assisted households in their recovery in the growth regressions are as follows.

Access to informal safety nets reduced the need for households to seek out food or cash from FFW/CFW or as help from family members. It is associated with increased buying of food on credit (perhaps because such credit was made available through these safety nets), which may undermine resilience to future shocks.

Disaster preparedness and mitigation prevented households from selling or slaughtering their livestock, drawing down on their savings, receiving food/money from family members, and using children as a source of labor. It is associated with increased employment in new wage labor and reliance on food aid.

Asset ownership is incidentally associated with selling/slaughtering of livestock and borrowing money from moneylenders (since those with more assets have the necessary resources for doing so). It may have reduced the need for households to participate in FFW/CFW and to buy food on credit.

Table 27: Summary: Which resilience capacities are associated with the coping strategies households used in response to the drought?

	Reduce food consumption	Sell or consume productive assets		Change labor patterns			Financial strategies				Receive food or financial assistance	
		Sell/ slaughter livestock	Consume seed stock	New wage labor	Increase child labor	Food/ cash for work	Borrow: friends/ relatives	Borrow: money lender	Buy food on credit	Draw down on savings	Food aid	Help: family
Absorptive capacity												
Bonding social capital	-											
Holdings of savings	-											
Access to informal safety nets						-			+			-
Availability of hazard insurance						a/		-	a/		-	-
Disaster preparedness and mitigation		-		+	-					-	+	-
Asset index (RMS-2 Round 1)		+				-		+	-			
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 (RMS-2 Round 1)		+				-		+	-			
Transformative capacity												
Bridging social capital	-											
Linking social capital								+				
Access to markets	-											
Access to infrastructure			+									
Access to services								+	-			
Access to communal natural resources						-						
Availability of formal safety nets						-			+	-		-
Community resilience capacity												
Number of natural resource managmt groups		+	+		-	-		+				+
Disaster risk reduction index					+				-			+
Social protection index					-				+			
Presence of a civic group				+				-				
Access to communal natural resources						-						

Note: Shaded boxes indicate that the resilience capacity coefficient is statistically significant at least at the five percent level, with blue boxes indicated a positive coefficient and orange boxes a negative coefficient. The analysis is undertaken using the round-stacked data set.

a/ Regression coefficient cannot be estimated because the availability of hazard insurance does not vary within the yes/no categories of these coping strategies.

Access to financial resources not surprisingly increased the use of two financial strategies: buying food on credit and drawing down on savings. It also prevented the use of child labor. Note that despite being identified as having increased households’ resilience to the drought, it is associated with *increased* use of the coping strategy or reducing food consumption.

Availability of formal safety nets reduced households’ need to engage in new wage labor (including FFW/CFW), draw down on savings, and rely on assistance from family members. However, it is associated with increased buying of food on credit.

Presence of a civic (community building) group assisted households to engage in new wage labor while reducing their borrowing of money from friends and relatives.

The three additional resilience capacities that may have enabled the resilience PDs to do better than their peers are bonding social capital, availability of hazard insurance, and exposure to information (Table 26). While the data in Table 27 do confirm that bonding social capital helped to buffer households’ food consumption, it is not associated with any of the other coping strategies. Availability of hazard insurance may have reduced the need for PD households to borrow or receive gifts of food or money from friends/relatives, as well as to draw down on their savings. Finally, exposure to information may have somehow boosted PD households’ ability to receive food or financial assistance from friends and family.

8.4 Is Greater Resilience Capacity Associated with Lower Reliance on Humanitarian Assistance?

Are households with greater resilience capacity less likely to rely on humanitarian assistance to cope with climate disasters? This question is important to investigate because doing so helps us understand whether investing in boosting households' resilience capacities as a preventative measure will reduce the large development costs associated with emergency response.

Table 28 summarizes probit regression results examining the relationship between the resilience capacities and households' receipts of food aid and FFW/CFW—the two types of humanitarian assistance found in Chapter 7 to have bolstered households' resilience to the drought. The resilience capacity that is associated with lower receipts of both types of assistance is asset ownership. The higher is this indicator of household wealth, the lower the probability of a household receiving humanitarian assistance. This relationship is surely driven by need on the part of households, but may also be affected by geographical targeting of assistance to the most drought-affected areas, areas where livestock asset depletion is underway. Several other resilience capacities are associated with lower receipts of food aid (but not FFW/CFW):

- Bonding social capital
- Access to markets
- Access to communal natural resources
- Disaster risk reduction (community level)
- Social protection at the community level

Note that three capacities associated with a lower food aid receipts are not highlighted in Table 28 because they did not meet the statistical significance criteria (their coefficients were significant at the 10 percent rather than 5 percent level). These are: holdings of savings, bridging social capital, and aspirations/confidence to adapt. While more evidence is needed, these capacities may also help households manage independently—without resorting to outside assistance.

Seven of the resilience capacities have a *positive* association with food aid and/or FFW/CFW receipts (highlighted in blue). The reason for the positive association for the availability of formal safety nets is obvious. The positive association for informal safety nets may be due to the fact that these protections provide the means for communities in need to advocate for assistance through more formal mechanisms. The positive association for access to infrastructure and services, including financial services, could be due to the fact that areas with greater infrastructure and services are more easily accessible for food aid deliveries. The positive association for availability of hazard insurance and disaster preparedness and mitigation, both indicators of absorptive capacity, may be simply due to the fact that areas with these capacities are more shock-prone historically and thus attract more assistance during shocks.

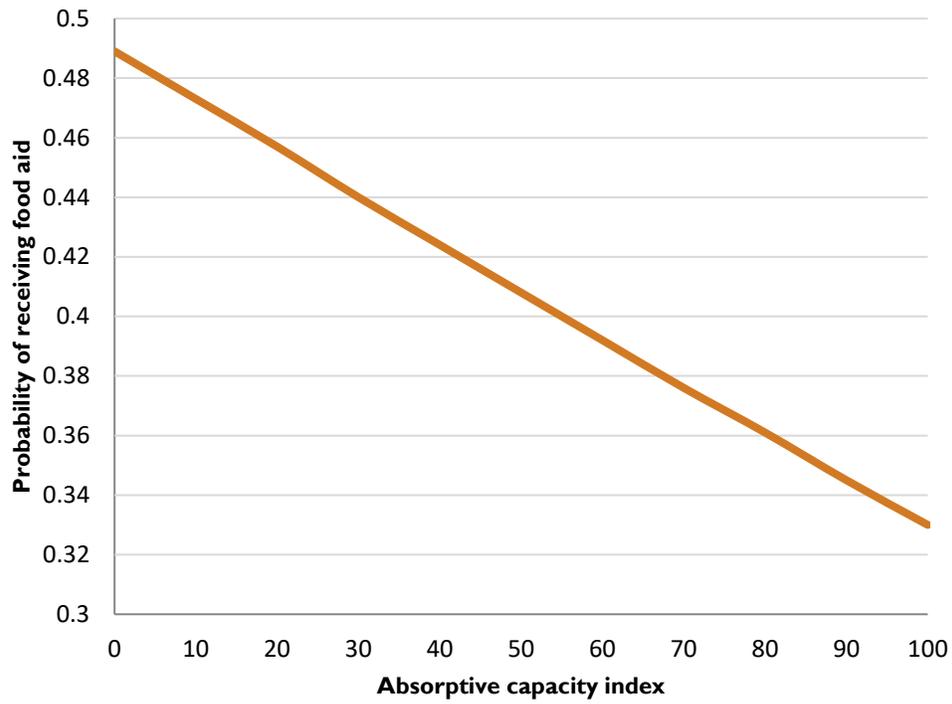
Table 28: Summary: Association between resilience capacities and humanitarian assistance

	Food aid	Food/ cash for work
Absorptive capacity		
Bonding social capital	-	
Holdings of savings		
Access to informal safety nets	+	
Availability of hazard insurance	+	
Disaster preparedness and mitigation	+	+
Asset index (RMS-2 Round 1)	-	-
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 (RMS-2 Round 1)	-	-
Transformative capacity		
Bridging social capital		
Linking social capital		
Access to markets	-	
Access to infrastructure	+	+
Access to services	+	
Access to communal natural resources	-	
Availability of formal safety nets	+	
Community resilience capacity		
Number of natural resource managment groups		
Disaster risk reduction index	-	
Social protection index	-	
Presence of a civic group		
Access to communal natural resources	-	

Note: Shaded boxes indicate that the resilience capacity coefficient is statistically significant at least at the five percent level, with blue boxes indicating a positive coefficient and orange boxes a negative coefficient. The analysis is undertaken using the round-stacked data set.

When looking more broadly at the three dimensions of resilience capacity, the only one whose index shows up as having a statistically significant relationship with humanitarian assistance is absorptive capacity (data not shown), which appears to reduce households' need for food aid (see Figure 25).

Figure 25: Relationship between the probability of receiving food aid and absorptive capacity



8.5 Summary: Drought Recovery: The Role of Households' Resilience Capacities

The analysis in this final results chapter finds that, along with PRIME interventions and humanitarian assistance, households' own prior resilience capacities likely played a strong role in their recovery from the drought. The following resilience capacities, grouped into the three dimensions of resilience capacity—absorptive, adaptive and transformative—were found to have enabled households to recover from the 2015/16 El Niño and Indian Ocean Dipole droughts:

Absorptive capacities

- Bonding social capital
- Cash savings
- Access to informal safety nets
- Availability of hazard insurance
- Disaster preparedness and mitigation
- Asset ownership

Adaptive capacities

- Bridging social capital
- Access to financial resources
- Human capital
- Exposure to information
- Asset ownership

Transformative capacities

- Bridging social capital
- Access to markets
- Availability of formal safety nets

One community resilience capacity, the presence of a civic group in households' communities, was also found to have enabled households' resilience.

The above capacities reduced households' reliance on a number of coping strategies, including seeking out new wage labor, receiving food or money from family members, selling or slaughtering livestock, drawing down on savings, and using children as a source of labor.

Households' overall absorptive capacity and many of the individual resilience capacities are associated with lower receipts of humanitarian assistance, including asset ownership, bonding social capital, access to markets, access to communal natural resources, disaster risk reduction, and social protection at the community level. This finding suggests that investment in boosting certain resilience capacities as a preventative measure can reduce the large development costs associated with emergency response.

9. CONCLUSIONS AND PROGRAM IMPLICATIONS

Conclusions

A series of back-to-back rainy season failures occurred in the PRIME IE area starting in March 2014, three months after the PRIME baseline survey was implemented, and culminated in the El Niño/Indian Ocean Dipole droughts of 2015/16. These conditions exposed households in the PRIME IE area to numerous downstream drought impacts, having major effects on livestock and agricultural production. The shocks to agricultural production and livestock rearing stemmed from and compounded widespread economic shocks such as food price inflation and input price increases. Resource scarcities associated with the climate shocks also lead to increased conflict. The quantitative data confirm that these droughts have had a significant negative impact on households' food security. The qualitative data indicate that they had particularly negative impacts on women, the elderly, and children.

The most commonly reported strategies used by households to cope with the 2015/16 droughts, the subject of this RMS-2 report, were to reduce food consumption, dispose of assets, borrow money and rely on other households for assistance. Many of the coping strategies used in RMS-1 were no longer used by households in RMS-2, a sign that there was widespread dwindling of resources and income opportunities and that coping strategy exhaustion was setting in. Bonding social capital from relatives began to erode, with households becoming more reliant on assistance from non-relatives and people living outside of one's own community. Two other strategies that increased over time were reliance on savings and receiving humanitarian assistance from the government.

Not all households in the PRIME IE area were equally impacted by the 2015/16 droughts. Roughly half were able to get back to their pre-drought food security or better by round 6th of the data collection, a good indicator of their resilience. The other half were not. Households' resilience to the droughts was far lower on average, in Jijiga than in Borena (35 versus 58 percent). Pastoralists were more resilient than non-pastoralists; agro-pastoralists were the least resilient. As part of the RMS-2 analysis, a positive deviant analysis was also carried out on groups of households that fared far better than average over the course of the drought waves. Along with growth regressions, this analysis was helpful in revealing the factors that enabled households to recover from the droughts.

This RMS-2 analysis provides preliminary evidence that the interventions of the PRIME project, the main goal of which are to “reduce poverty and hunger by enhancing resilience to climate change,” have served to enhance household resilience to drought. Households that were exposed to more project activities were less likely to see a deterioration of their food security as the severity of the drought increased as compared with households that were exposed to fewer project activities. Greater exposure to project activities reduced unplanned livestock deaths, and reduced household reliance on borrowing from money lenders and non-family members.

Humanitarian assistance (food aid and food/cash for work) was also found to have a positive effect on a household's ability to recover from drought. It appears to have reduced reliance on negative coping strategies such as consuming seed stock, drawing down on savings, and buying food on credit. The quantitative data analysis provided evidence that early timing of assistance gave an added boost to households' ability to recover from the drought. This was particularly the case in Jijiga.

The RMS2 analysis shows that certain resilience capacities possessed by households played an additional important role in the recovery from the drought. Access to assets (especially livestock), access to social capital (both bonding and bridging), access to financial resources (savings and credit), human capital, access to markets, access to information, and the availability of formal safety nets all played a significant role in drought recovery. Strengthening all of these capacities are key priorities of the PRIME project. Many of the resilience capacities are associated with lower receipt of humanitarian assistance. These findings suggest that investments that strengthen certain resilience capacities can reduce the need for large humanitarian assistance responses.

The importance of these resilience capacities in enabling households to manage shocks in order to maintain well-being levels and reduce reliance on outside assistance will be further investigated in the endline survey that will commence December 2017. This will be a full impact evaluation of the PRIME project employing advanced evaluation techniques to determine which interventions or combination of interventions strengthened which particular capacities that, in turn, led to greater household resilience to drought in the project area.

Program Implications

Based on the findings of this report, **comprehensive multi-sectoral programming** has helped strengthen household and community resilience capacities to manage drought. Households that are exposed to layering, sequencing and integrating of multiple interventions are more likely to manage and recover from droughts and their downstream effects than households that are not.

Comprehensive programming that strengthens multiple resilience capacities reduces the need for food and cash transfers. It also reduces the need to turn to negative coping strategies such as borrowing from (and becoming indebted to) money lenders and pulling children out of school and sending them to work.

Asset creation, access to financial services and cash savings are all critical for strengthening resilience. Assets such as livestock can be sold, and savings can also be used to manage times of stress. Protecting livestock assets such as cattle and goats from unplanned deaths through fodder and water provision, market off take and veterinary services can be critical to helping households manage shocks.

Access to financial services and markets are also critical for diversifying livelihoods into activities not as susceptible to climatic risks. **Human capital and access to good information** (early warning and market information) will be critical to successful diversification strategies.

Even though pastoralists appear to be more resilient than non-pastoralists and agro-pastoralists, more focus must be given to providing successful livelihood opportunities for people moving out of

pastoralism. As youth move to urban areas out of pastoralism, skills training (including soft skills related to job readiness) will need to be provided to prepare them for other employment options.

Interventions that strengthen **social capital** also have a positive impact on resilience. Bonding social capital can be increased through group formation, such as formation of savings groups, natural resource management committees, pasture management groups, livestock marketing groups, etc. What projects often do not track is how collective action increases as members of these groups gain more trust in each other through regular interaction. Groups that were formed for one function (savings groups) can engage in other collective action functions (natural resource management groups) that are also critical to managing shocks. Projects need to do a better job of tracking these changes as part of their monitoring system.

In addition, social capital is not an infinite resource and can be eroded through time as successive droughts impact an area. For this reason it is important to strengthen other capacities that households may turn to such as **diversification of livelihoods into different risk environments**.

Given the severity of the 2015/16 droughts, many households were forced to rely on **food and cash transfers** to cope. Using good trigger indicators to determine the optimal timing, scale and duration of such formal transfers can be critical to enabling households to manage the drought without turning to negative coping strategies. In addition, early receipt of such transfers can lead to early recovery. **Hazard insurance and disaster risk reduction interventions** also show promise as protective measures that lessen the impact of droughts.

APPENDIX I: QUANTITATIVE QUESTIONNAIRE

	<p>Pastoralist Resilience Improvement and Market Expansion (PRIME) Impact Evaluation PRIME Interim Household Survey 2015-16 Questionnaire</p>
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This questionnaire is meant to provide information about pastoralist households in PRIME IE areas

MODULE I: HOUSEHOLD IDENTIFICATION COVER SHEET

101: Region	102: Zone	103: Woreda	104: Kebele	105: Cluster	106: HH No.	107: GPS UNIT (UTM reading)								108: Enumer Code	109: Super Code
						WP	ELEV	Easting				Northing			
110: Name of Household Head			111: Name of Respondent			112: Serial Number of Respondent				113: Date of survey dd/mm/year					

MODULE 2. SHOCKS

	201	202	203
	In the past two months did your household experience any of the following events? 1 = Yes 2 = No >> Next event	How severe is the impact on your income and food consumption? Enter code from list	How confident are you that you will recover? Enter code from list
Climatic shocks			
a. Excessive rains			
b. Too little rain/drought			
c1. Livestock disease			
c2. Crop disease			
d. Very bad harvest			
e. Landslides/erosion			
Conflict shocks			
f. Theft of money			
g. Theft of crops			
h. Theft or destruction of assets			
i. Theft of livestock (raids)			
j. Destruction or damage of house due to violence			
k. Loss of land due to conflict			
l. Violence against household members			
Economic shocks			
m. Food price inflation			
n. Unavailability of agricultural or livestock inputs			
o. No demand for agricultural or livestock products			
p. Increase in price of agricultural or livestock inputs			
q1 Drop in price of agricultural products			
q2 Drop in price of livestock products			
r. Death of household member			

SHOCKS CODE LIST

202	203
Severity of impact	Recovery
1. None 2. Slight impact 3. Moderate impact 4. Strong impact 5. Worst ever happened	1. Will not recover 2. Will recover some, but will be worse off than before [event] 3. Will recovered to the same level as before [event] 4. Will recover and be better off 5. Will not be affected by [event]

204. How will you cope with the stressful events you are experiencing? Will you.... **(check response)**

	YES	NO		YES	NO
LIVESTOCK AND LAND HOLDINGS			COPING STRATEGIES TO GET MORE FOOD OR MONEY		
a. Send livestock in search of pasture			l. Take up new wage labor		
b. Sell livestock			m. Sell household items (e.g., radio, bed)		
c. Slaughter livestock			n. Sell productive assets (e.g., plough, water pump)		
e. Lease out land			o. Take out a loan from an NGO		
MIGRATION			p. Take out an loan from a bank		
f. Migrate (only some family members)			r. Take out a loan from friends or relatives		
g. Migrate (the whole family)			q. Take out a loan from a money lender		
h. Send children or an adult to stay with relatives			s. Send children to work for money (e.g., domestic service)		
			t. Receive money or food from family members		
COPING STRATEGIES TO REDUCE CURRENT EXPENDITURE			u. Receive money or food from people in your community who are not your relatives		
i. Take children out of school			v. Receive money or food from people living elsewhere who are not your relatives		
j. Move to less expensive housing			w. Receive food aid from the government		
k. Reduce food consumption			x. Receive food aid from an NGO		
			y. Participate in food-for-work or cash-for-work		
			z. Use money from savings		
			aa. Get money from a relative that migrated (remittances)		

205. Have you provided any money or food or other assistance to any other households in the past 2 months? (yes, no)

206. If yes, who? [multiple response]

Category	Yes	No
a. Relatives inside your community		
b. People in your community who are not relatives		
c. Relatives outside your community		
d. People outside your community who are not relatives		

MODULE 3. FODDER AND WATER AVAILABILITY

301	Do you own any livestock?	1 = Yes 2 = No (Skip to Module 4) -8 DK -9 Refused
302	Is there enough fodder available to feed all of your animals?	1 = Yes 2 = No -8 DK -9 Refused
303	Is there enough water available for all of your animals?	1 = Yes 2 = No -8 DK -9 Refused
304	In the last two months, has there been any conflict between people in your Kebele and people living elsewhere over ... access to fodder?	1 = Yes 2 = No -8 DK -9 Refused
305	... access to water?	1 = Yes 2 = No -8 DK -9 Refused

MODULE 4. FOOD INSECURITY COPING STRATEGIES

	401
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:	Number of days out of the past seven (Use 0 – 7 to answer number of days. Use 99 for not applicable)
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. Limit portion size at mealtimes?	
h. Restrict consumption by adults in order for small children to eat?	
i. Feed working members of HH at the expense of non-working members?	
j. Reduce number of meals eaten in a day?	
k. Skip entire days without eating?	

MODULE 5. HOUSEHOLD 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.

501	Any bread, rice, pasta, injera, biscuits, or other foods made from teff, barley, millet, sorghum, maize, rice, wheat?	1. Yes 2. No
502	Any foods made with potatoes, yams, sweet potatoes, irish potatoes, manioc, cassava, kocho, godere, anchote, amicho, boina and boye, or bula?	1. Yes 2. No
503	Any food made with vegetables such as onions, cabbage, green leafy vegetables, gathered wild green leaves, tomato, cucumber, pumpkin, mushroom, kale, leak, green pepper, beat root, garlic, or carrots?	1. Yes 2. No
504	Any food or fruit juices made from fruits such as mango, banana, oranges, pineapple, papaya, guava, avocado, wild fruit (masau, malambe), or apple?	1. Yes 2. No
505	Any food made from beef, lamb, goat, rabbit, wild game, chicken, duck, or other birds, other meats?	1. Yes 2. No
506	Any eggs?	1. Yes 2. No
507	Any fresh fish, smoked fish, fish soup/sauce or dried fish or shellfish?	1. Yes 2. No
508	Any foods made from beans (white, brown, horse), peas, lentils, chickpeas, rape seed, linseed, sesame, sunflower, vetch soybean flour or nuts (groundnuts, groundnut flour)?	1. Yes 2. No
509	Any cheese, yogurt, milk, powder milk, buttermilk or other milk products?	1. Yes 2. No
510	Any foods made with oil, margarine, fat, or butter?	1. Yes 2. No
511	Any sugar, sugar cane, or honey?	1. Yes 2. No
512	Any other foods, such as condiments, traditional beer, beer, wine, coffee or tea?	1. Yes 2. No

MODULE 6. HOUSEHOLD HUNGER

601	In the past four weeks, did you worry that your household would not have enough food?	1. Yes 2. No (Skip to 602)
601a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)
602	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 603)
602a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)
603	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 604)
603a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)
604	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 605)
604a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)
605	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 606)
605a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)
606	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 607)
606a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)

607	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 608)
607a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)
608	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 609)
608a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)
609	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
609a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)

MODULE 7. ASSET OWNERSHIP

CONSUMPTION AND PRODUCTIVE ASSETS

	701
	Number owned now -8 DK -9 Refused
a. Improved charcoal/wood stove	
b. Bed	
c. Telephone apparatus	
d. Radio	
e. Jewelry	
f. Modern Chair	
g. Plough	
h. Sickle	
i. Pick axe	
j. Axe	
k. Hoe	
l. Spade or shovel	
m. Whip (leather)	
n. Traditional beehive	
o. Stone grain mill	
p. Agricultural land (hectares)	

LIVESTOCK ASSETS

	702	703				704	705
Type of livestock	Number owned now -8 DK -9 Refused	Livestock body conditions (Skip to 603 if none owned) Number owned now who are:				Number slaughtered for meat in the last two months -8 DK -9 Refused	Number with an unplanned death in the last two months -8 DK -9 Refused
		Very thin (1)	Thin (2)	Normal (3)	Fat (4)		
a. Oxen							
b. Cattle							
c. Sheep							
d. Goats							
e. Camels							
f. Poultry							

ACCESS TO LIVESTOCK MARKETS

706. What has been the most significant change in access to markets for sales of livestock over the last two months? (Single response)

- 1=no change
- 2=prices decreased
- 3=nearby markets have closed, have to go to more distant markets
- 4=no buyers in markets
- 5=increased cost (time or money) to transport animals or products to market
- 6=prices increased
- 7=Closer markets have become active
- 8=Decreased cost (time or money) to transport animals or products to market
- 9=Other (Specify)

MODULE 8. HUMANITARIAN ASSISTANCE

801. In the last two months, has your household received any food aid from the government or an NGO?	1. Yes 2. No -8 DK -9 Refused
802. In the last two months, has your household received any cash from the government or an NGO?	1. Yes 2. No -8 DK -9 Refused
803. In the last two months, has anyone in your household participated in food-for-work or cash-for-work?	1. Yes 2. No -8 DK -9 Refused
804. 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
805. In the last two months, has your households received assistance from the government or an NGO with access to drinking water?	1. Yes 2. No -8 DK -9 Refused
806. In the last two months, has anyone in your Kebele received assistance from the government or an NGO with access to water for animals?	1. Yes 2. No (Skip to q808) -8 DK -9 Refused
807. Did your animals get some of this water?	1. Yes 2. No -8 DK -9 Refused
808. In the last two months, has anyone in your Kebele 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 (End survey)

****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: TOPICAL OUTLINES FOR QUALITATIVE DATA COLLECTION

Focus Group Interview (men and women separately)

I. Shocks

A. Characteristics

1. What types of shocks are experienced? How long do they last (e.g., days, months)? How many people are affected? (*draw a timeline with participants of shocks and duration*)
2. How is it affecting the community (whole community/ women/ men)?

2. Household and Community Responses (attitudes) to Shocks

A. How do households and the community respond to the shock?

1. Do households and the community know about the shock in advance?
 - a. If yes, what actions did the households and community leaders and members take together to reduce the impact of the shock on the community?
 - b. What actions were most effective in reducing the shock?
 - c. If no actions were taken, why not?
2. Are people in the community supporting each other to recover? How? If not, why not?
3. Are there project interventions (i.e., PRIME) that enable households and communities to cope better with shocks? How?
4. Are there project interventions (i.e., PRIME) that enable households and communities to recover better from shocks? How?
5. Have the levels of trust within the community changed (i.e., do people within the community trust each other more or less)? How?
6. Do people feel that crime has increased or decreased? Describe any changes in how people feel about their physical safety in the community.

3. Behavior

A. What actions are households and the community taking to respond to the shock? What actions are people taking to cope?

1. Are people working together as a community to cope with each shock? How?
2. What has the community learned from previous experience about how to respond to shocks?
3. What did people do differently this time in responding to a shock?
4. Are people within the community sharing resources?
 - a. Which resources are they sharing (e.g., money, food, labor, information, other)?
 - b. Who do they share with (e.g., family, neighbors, most vulnerable, etc.)?
 - c. Who gets priority when sharing resources? (*ask participants to do a simple ranking of resources that are shared, and who gets priority*)

- d. What are people doing to help each other be productive again (e.g., labor exchange, loaning inputs such as animal labor, passing on information)?
- e. What are negative ways in which people are coping (e.g., theft, begging, etc.)?
5. How are shocks affecting relationships within the community? (e.g., between individuals, between individuals and local government, etc.)
6. Has social support eroded through time due to continuous drought episodes over the past several years? Please explain.
7. Are there differences in social support across villages? Please explain.
8. Are people breaking up into subgroups to manage shocks?
 - a. If yes, why? What are the groups?
 - b. How does this affect the community's ability to cope?
9. Is there new or renewed conflict due to shocks?
 - a. In the community?
 - b. With other communities?
 - c. If yes, how do households and the community deal with this conflict?
 - d. What kinds of conflict resolution mechanisms are used, and who uses them?
10. Are communities or individuals in other locations assisting you to cope with shocks? Explain.
11. Do people in the community use their connections to people in authority to access support (formal safety nets, services)? How?

4. Participation

(Ask participants to draw a Venn diagram showing relative contribution of different community members. Draw lines to show who is giving help to which person/group, who is receiving help, and who is not receiving help.)

- A. Are community leaders effective at organizing support for all members of the community? Why or why not?
1. Who else in the community is helping community members deal with shocks?
 2. Is the community engaged in collective action to deal with shocks?
 - a. What kinds of collective action?
 - b. Is there collective action on:
 - i. Maintaining or repairing important community infrastructure (e.g., roads, markets, schools, water, health care facilities, etc.)?
 - ii. Managing common or critical natural resources?
 - iii. Deciding on community priorities through meetings open to all?
 - iv. Cooperative actions with other communities to reduce/respond to shocks that affect multiple communities?
 - v. Other activities?
 3. How is this collective action organized (e.g., through religious organizations, informal groups, NGOs, project, government, other)?
 - a. How is each of these groups helping?

4. Is participation in collective action influenced by gender? How?
5. Which households are not participating in collective action? Why?
6. Do you think your community is successfully recovering from the shocks it is exposed to? Why or why not?
7. What do you think are the main differences between a community that successfully responds to a shock and one that does not?

5. Participation in Markets

- A. To what extent do households and the community participate in marketing activities?
1. Who participates in market activities?
 - a. Do both men and women participate? Please explain.
 2. What types of market activities?
 3. Are these market activities seasonal?
 4. As market participation increased as a result of the REGAL projects? Please explain.

6. Livelihood Diversification

- A. What kinds of livelihood activities are households engaged in?
1. Are these activities affected differently by different types of shocks? Please explain.
 2. Are some livelihood activities less susceptible to droughts than others? Please explain.
 3. Are some households better able to manage shocks and stresses than others? What is different about these households?

7. Adaptive Capacity

- A. Are there differences in the way that households recover from shocks?
1. Why are some households more successful in recovering from a shock than others? Please explain.
 2. Are there proactive livelihood adaptations that the more successful households are making to recover from the shocks? What are they?
 3. Are there households that feel that each person's future is a matter of destiny? What types of livelihood activities are they engaged in?
 4. Are there households that believe that each person is responsible for their future success or failure? What types of livelihood activities are they engaged in?
 5. Are there differences between these types of households regarding their ability to cope with shocks? Please explain.

Topical Outline – Key Informant Interviews

1) Participation in Government or NGO programs

- What Government or NGO programs are active here?
 - Describe activities
 - Do government and NGO or other programs coordinate activities?
 - Who benefits and how? (men, women)
 - Who does not participate/benefit? Why?
- How have these programs affected the community?
 - Positive changes
 - Negative changes
- Effects of external support on community sharing?
- Which programs are managed well? Which are not managed well? Why?
- Recommended changes to these programs? What is missing?
- Has the community used its links to:
 - Obtain government services? Which ones? For whom?
 - Advocate for change? On what issues? What was the result?
 - Gain access to formal safety nets?

2) Shocks, Risks, & Coping Strategies

- Types of coping strategies when income or agricultural/livestock production is not enough?
- Reliance on other households during income and food shortages?
 - What kind of support?
 - Any changes in this practice? How? Why?
- Household and community adaptations to reduce long-term shocks
- Role of the community in reducing the impact of shocks. Any changes in the last 5 years? What changes?
- Role of organizations in managing shocks
 - Government
 - NGO, community organizations
 - Any changes in the past 5 years? What changes?

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