



**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**

## **Baseline Survey Report Volume I: Main Report**

**January 2015**

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Tim Frankenberger, President  
**TANGO International**

# Table of Contents

Acknowledgements .....	i
Acronyms .....	i
Executive Summary .....	ii
Chapter 1. Introduction.....	1
1.1 Feed the Future and FEEDBACK Overview.....	1
1.2 Description of the PRIME Project.....	1
1.3 General Overview of the Project Area Within the Broader Ethiopia Context .....	4
1.4 What Is Resilience?.....	5
1.5 The PRIME IE: Objectives and Research Questions.....	5
1.6 Baseline Survey Objectives.....	6
1.7 Organization of the Report .....	6
Chapter 2. Methodology.....	7
2.1 Data Collection.....	7
Objectives of the Data Collection.....	7
Quantitative Survey Instruments.....	7
Qualitative Survey Instruments .....	8
Survey Sampling Design .....	9
Enumerator Training, Field Schedule, and Details of the Qualitative Data Collection .....	11
Challenges Encountered During Training and Data Collection .....	13
Country Approvals Obtained and Respondent Informed Consent.....	14
2.2 Analysis of the Quantitative Data .....	14
Descriptive Analysis .....	14
Multivariate Analysis .....	16
2.3 Analysis of the Qualitative Data.....	18
2.4 Integration of Quantitative and Qualitative Analyses .....	18
Chapter 3. Household and Community Livelihood Environment .....	19
3.1 Demographic and Housing Characteristics .....	20
3.2 Livelihood Activities.....	24
3.3 Migration Patterns .....	25
3.4 Livestock Ownership and Access to Land .....	27
3.5 Livestock Production and Marketing System.....	30
3.6 Differences in Results by PRIME IE Intervention Group.....	42
Chapter 4. Well-Being Outcomes: Poverty, Food Insecurity, and Child Malnutrition.....	44
4.1 Poverty.....	44
4.2 Food Insecurity .....	48
Consumption Indicators.....	48

Experiential Indicators.....	49
4.3 Child Malnutrition .....	54
4.4 Differences in Results by PRIME IE Intervention Group.....	56
Chapter 5. Shock Exposure.....	58
5.1 Types of Shocks Experienced in the Previous Year.....	58
5.2 Perceived Severity of Shocks and Shock Exposure Index .....	60
5.3 Differences in Results by PRIME IE Intervention Group.....	62
Chapter 6. Resilience Capacity .....	64
6.1 Past Shocks: Ability to Recover and Coping Strategies .....	64
6.2 Psychosocial Measures of Resilience Capacity: Aspirations and Confidence to Adapt .....	71
6.3 Social Capital.....	75
6.4 Livelihood Diversification.....	82
6.5 Ownership of Productive Assets and Access to Financial Resources .....	83
6.6 Access to Markets, Services, and Infrastructure .....	88
6.7 Access to Information.....	93
6.8 Availability of Disaster Planning and Response Services .....	96
6.9 Indexes of Household Resilience Capacity: Absorptive Capacity, Adaptive Capacity, and Transformative Capacity.....	97
6.10 Community Resilience .....	103
6.11 Differences in Results by PRIME IE Intervention Group.....	106
Chapter 7. Links Between Shock Exposure, Resilience Capacities, and Well- Being Outcomes .....	109
7.1 Links Between Well-Being Outcomes and Shock Exposure.....	110
7.2 Links Between Well-Being Outcomes and Resilience Capacity .....	112
7.3 Does Greater Household Resilience Capacity Reduce the Negative Impact of Shocks on Well-Being Outcomes? .....	115
Chapter 8. Conclusion: Key Findings and Next Steps .....	119
Key Findings .....	119
Next Steps .....	121
Appendix 1. Calculation of Measures of Resilience.....	123
A1.1 Index of Perceived past shocks.....	123
A1.2 Index of Aspirations and Confidence to Adapt.....	125
A1.3 Indexes of Bonding, Bridging, and Linking Social Capital .....	126
A1.4 Index of Absorptive Capacity.....	128
A1.5 Index of Adaptive Capacity.....	129
A1.6 Index of Transformative Capacity .....	131
A1.7 Index of Household Resilience Capacity .....	132
A1.8 Index of Community Resilience.....	132
References .....	135

## Tables

Table 2-1.	Number of <i>Kebeles</i> and Households in Each Survey Stratum.....	10
Table 2-2.	The PRIME IE Baseline Sample: Sample Size and Number of Households and Communities in Each Stratum .....	11
Table 2-3.	<i>Kebeles</i> Selected for Focus Groups and Key Informant Interviews .....	12
Table 3-1.	Household Demographic Characteristics.....	20
Table 3-2.	Education and Occupation Status of Adult Household Members .....	22
Table 3-3.	Household Dwelling Characteristics .....	23
Table 3-4.	Livelihood Activities .....	25
Table 3-5.	Migration Patterns and Remittances .....	26
Table 3-6.	Livestock Ownership.....	28
Table 3-7.	Access to Land.....	30
Table 3-8.	Livestock Market Participation: Stocks, Purchases and Sales in the Last Year (Mean TLUs).....	32
Table 3-9.	Production, Consumption, Sales, and Purchases of Livestock Commodities.....	35
Table 3-10.	Consumption of Animal Milk by Children Under 5.....	37
Table 3-11.	Fodder Types and Availability.....	39
Table 3-12.	Livestock Water Availability .....	41
Table 4-1.	Expenditures, Assets, and Poverty .....	46
Table 4-2.	Food Security: Calorie Consumption, Undernourishment, and Dietary Diversity.....	50
Table 4-3.	Food Security: Household Hunger Scale and Prevalence of Hunger .....	51
Table 4-4.	Food Security: Food Insecurity Coping Strategies and Coping Strategy Index .....	52
Table 4-5.	Child Malnutrition: Wasting Among Children Under 5.....	55
Table 5-1.	Percent of Households Experiencing Various Shocks in the Last Year.....	58
Table 5-2.	Perceived Severity of Shocks Among Those Who Experienced Shocks .....	61
Table 6-1.	Perceived Ability to Recover from Various Shocks.....	65
Table 6-2.	Coping Strategies in Response to Shocks.....	67
Table 6-3.	Aspirations and Confidence to Adapt.....	71
Table 6-4.	Formal and Informal Sources of Social Support Received in the Last Year.....	76
Table 6-5.	Indexes of Bonding, Bridging, and Linking Social Capital .....	81
Table 6-6.	Diversity of Livelihood Sources.....	82
Table 6-7.	Ownership of Productive Assets .....	84
Table 6-8.	Access to and Usage of Credit and Savings Support.....	85
Table 6-9.	Access to Markets.....	88
Table 6-10.	Access to Animal Health Services .....	90
Table 6-11.	Availability of Infrastructure and Services in Communities .....	92
Table 6-12.	Percent of Households with Access to Various Sources of Information .....	94

Table 6-13. Percent of Communities with Disaster Planning and Response Services.....	96
Table 6-14. Indexes of Absorptive, Adaptive and Transformative Capacity.....	98
Table 6-15. Community Organizations Available, by Project Area.....	104
Table 6-16. Community Resilience.....	105
Table 7-1. Regression Analysis: Relationship Between Well-Being Outcomes and Shock Exposure .....	110
Table 7-2. Regression Analysis: Relationship Between Well-Being Outcomes and Household Resilience Capacity.....	112
Table 7-3. Regression Analysis: Relationship Between Well-Being Outcomes and Household Absorptive, Adaptive, and Transformative Resilience Capacity .....	114
Table 7-4. Regression Analysis: Relationship Between Well-Being Outcomes and Community Resilience Capacity .....	115
Table 7-5. Regression Analysis: Does Greater Resilience Capacity Reduce the Negative Impact of Shocks on Well-Being Outcomes? .....	116
Table A-1. Descriptive Statistics for Resilience Capacity Indicators .....	123

## Figures

Figure 1-1. PRIME Project Intervention Areas.....	2
Figure 1-2. PRIME Project Causal Model.....	3
Figure 3-1. Percent of Pastoralists, Agro-Pastoralists, and Non-Pastoralists, by Project Area .....	20
Figure 3-2. Percent of Communities with Various Land Tenure Types, by Project Area.....	29
Figure 3-3. Primary Places of Livestock Purchases, by Project Area .....	33
Figure 3-4. Primary Places of Livestock Sales, by Project Area .....	33
Figure 3-5. Primary Places of Livestock Commodity Sales, by Project Area.....	36
Figure 3-6. Means by Which Children Under 5 are Served Animal Milk, by Project Area.....	38
Figure 3-7. Source of Animal Milk for Children Under 5, by Project Area .....	38
Figure 3-8. Reasons Given for Why Fodder/Pasture Is Less Available This Year than Last, by Project Area .....	40
Figure 3-9. Reasons Given for Why Water Is Less Available This Year than Last, by Project Area.....	42
Figure 3-10. Percent of Pastoralists, Agro-Pastoralists, and Non-Pastoralists, by Intervention Group .....	43
Figure 4-1. Distribution of Per Capita Expenditures, by Project Area .....	47
Figure 4-2. Prevalence of Undernourishment and Hunger, by Poverty Status.....	53
Figure 4-3. Prevalence of Wasting Among Children Under 5, by Poverty Status .....	56
Figure 5-1. Index of Shock Exposure, By Poverty Status.....	62
Figure 6-1. Perceived Ability to Recover Index, by Poverty Status.....	67
Figure 6-2. Aspirations and Confidence to Adapt Index, by Poverty Status .....	72

Figure 6-3. Indexes of Bonding, Bridging, and Linking Social Capital, by Poverty Status .....	81
Figure 6-4. Diversity of Livelihood Sources, by Poverty Status.....	82
Figure 6-5. Reasons for Taking out Loans .....	87
Figure 6-6. Reasons for Holding Savings.....	87
Figure 6-7. Sources of Information, by Project Area.....	95
Figure 6-8. Indexes of Absorptive, Adaptive and Transformative Capacity (Means), by Poverty Status.....	99
Figure 7-1. Resilience Capacity-Mediated Relationship Between Shock Exposure and Household Food Insecurity .....	117

## Acronyms

CSA	Central Statistical Agency of Ethiopia
DDS	Dietary Diversity Score
FAO	United Nations Food and Agriculture Organization
FEEDBACK	Feed the Future FEEDBACK
FG	Focus Group
FGD	Focus Group Discussions
GPS	Green Professional Services
HFIAS	Household Food Insecurity Access Scale
HHS	Household Hunger Scale
HI	High Intensity
IE	Impact Evaluation
KII	Key Informant Interviews
LI	Low Intensity
NGO	Nongovernmental Organization
NRM	Natural Resources Management
PC	Pastoral Cluster
PCA	Principal Components Analysis
PRIME	Pastoralist Areas Resilience Improvement and Market Expansion
PSNP	Productive Safety Net Program
TANGO	Technical Assistance to NGOs
TLU	Tropical Livestock Units

## Executive Summary

The Pastoralist Areas Resilience Improvement and Market Expansion (PRIME) project has three interrelated objectives: increasing household incomes, enhancing resilience, and bolstering adaptive capacity to climate change among pastoral people in Ethiopia. This report provides the results from the baseline survey administered as part of an impact evaluation (IE) of the PRIME project, which is being undertaken under the auspices of the Feed the Future FEEDBACK (FEEDBACK) project of the U.S. Government. The overall objective of the IE is to determine the impact of the project's interventions on households' resilience to shocks and, thus, on well-being outcomes, including poverty, food security, and children's nutritional status.

Pastoral Ethiopia is one of the most shock-prone areas in the world. This impact evaluation provides a unique opportunity to measure resilience and to determine what kinds of interventions will work to maintain and improve households' livelihoods and well-being in the face of shocks.

The baseline survey was administered from November 19 to December 24, 2013, in two of the three sub-regions within the PRIME project's area of implementation, Borena and Jijiga. The evaluation focused on a sub-set of participants in two focus areas rather than the entire target population to allow for a closer measurement of a smaller group of households, saving costs and producing more valuable insights. The evaluation design team was also encouraged by the USAID/Ethiopia Mission to select these areas to carry out a dual-focused IE, where one dimension would focus on natural resource management (NRM) (in Borena) and the second would focus on improvements in livelihoods and market-enabling conditions (in Jijiga). The baseline survey has two quantitative components—a household survey and a community survey—as well as a qualitative component. The qualitative data were collected through focus group discussions, key informant interviews, and positive deviant<sup>1</sup> interviews.

## Household and Community Livelihood Environment

In-depth knowledge of the livelihood environment in which households function is important background for understanding households' resilience in the face of shocks and stressors.

The baseline household survey data confirm that the PRIME IE area is dominated by pastoralists and agro-pastoralists. However, non-pastoralists also comprise a large proportion of households, nearly one-quarter. Pastoralism is more prevalent in Borena than Jijiga, while agro-pastoralism and non-pastoralism are more prevalent in Jijiga. Farming and livestock rearing are the main sources of food and income; wage labor and salaried work are only important sources among non-pastoralists. In focus group (FG) discussions, women reported that their main occupation was unpaid domestic work, but more than 20 percent reported farming and livestock rearing as their main occupation. The predominant livelihood source for non-pastoralists is farming. Qualitative feedback indicates

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<sup>1</sup> Positive deviants are people within the community who have the same assets and access as other community members, but are more successful at leveraging those assets in a way that makes them more resilient.

that women who transition out of pastoralism are particularly disadvantaged in access to resources and have limited alternative livelihood opportunities.

Most people in the IE area live in thatched huts or tents, do not have access to a latrine, and have limited access to clean drinking water. Demographically, the majority of households have both male and female adults. Female-adult-only households, which can be more vulnerable to the effects of shocks, make up just over 10 percent of all households, rising to nearly one-fifth of non-pastoralist households. Another vulnerable group is households having a member with a disability, which comprise one-tenth of all households. One-quarter of the male population has any formal education; education is especially rare for females (8 percent). However, women recognize the value of education; female FG respondents in Jijiga reported that they seek out educational opportunities because it makes them better able to help address problems in their communities.

The main challenges to livestock rearing are animal disease, land degradation due to invasive plant species, predators, drought, and overgrazing. Participation in livestock markets is widespread but not universal: About 60 percent of all households purchased or sold an animal in the year prior to the survey. Travel distances to markets, in addition to lack of information and means of communication, are factors limiting market participation. Women in particular say that they face informational and physical barriers to obtaining fair market prices, such as for livestock.

Households in Borena tend to rely on communal sources of pasture, whereas many households in Jijiga own the lands on which their livestock graze or obtain fodder. Livestock owners in Borena report travel times to pasture nearly twice as long as those in Jijiga, which may be a function of their reliance on more distant communal lands. Pastoralists regularly use recurrent migration as a strategy to provide fodder and water for livestock. Respondents said family members opted for more permanent migration to gain education or to seek alternative sources of income.

The commodities produced from livestock—meat, milk, and hides—are a vital part of the livestock production and marketing system. Subsistence production dominates, with households consuming most of the meat, milk, and hides that they produce. Milk is an important source of protein and micronutrients for children: Three-fourths of children under 5 consumed milk in the week prior to the survey. As would be expected, children’s milk consumption is highest in pastoralist households.

## **Well-Being Outcomes: Poverty, Food Insecurity, and Child Malnutrition**

When total household expenditures per capita—a proxy measure of current income—is used as a means for assessing poverty, along with the \$1.25 poverty line, the prevalence of poverty is 56.3 percent in the PRIME IE area. This is far higher than the Ethiopia-wide prevalence of 30 percent. The expenditures poverty prevalence is more than three times higher in Borena than in Jijiga, though incomes are more unequally distributed in Jijiga. By the expenditures poverty measure, pastoralists are more likely to be poor than agro-pastoralists, and agro-pastoralists in turn are more likely to be

poor than non-pastoralists. The depth of poverty in the IE area (i.e., the average percentage shortfall in total expenditures from the poverty line) is 22.4 percent.

A different picture emerges when poverty is measured using asset ownership. By this measure of structural, long-term deprivation, a greater percentage of households in Jijiga live in poverty than in Borena. By the asset poverty measure, non-pastoralists are more likely to be poor than agro-pastoralists, and agro-pastoralists are more likely to be poor than pastoralists.

In terms of food insecurity, 45.6 percent of the population in the IE area is undernourished: They do not eat enough food (calories) for an active, healthy life. Dietary quality, as measured by dietary diversity, is very poor. Apart from milk and milk products, food groups that are important sources of micronutrients and protein (e.g., fruits and vegetables, meat, eggs, and legumes) are rarely eaten. Experiential indicators of food insecurity, the Household Food Insecurity Access Scale (HFIAS) and Household Hunger Scale (HHS), concur that the food security situation in the area is very poor. According to these measures, more than 75 percent of households suffer from food insecurity and nearly 20 percent from its most extreme form, hunger. The most commonly employed strategies for coping with food insecurity are relying on less preferred and less expensive foods, limiting portion sizes at meal times, and reducing the number of meals eaten in a day.

Undernourishment is far higher in Borena than Jijiga. However, dietary diversity is worse in Jijiga, and households are far more likely to experience hunger. Similarly, while pastoralists appear to eat less overall than agro- or non-pastoralists, non-pastoralists have the lowest diet quality and do the poorest on all experiential measures of food insecurity.

The prevalence of wasting among children under 5, which may be related to acute food deprivation or severe disease or both, is 12.2 percent in the PRIME IE area. It is more than twice as high in Borena as in Jijiga, and more prevalent among pastoralists and agro-pastoralists than non-pastoralists.

## Shock Exposure

Detailed understanding of the shocks and stressors that affect households is required for effective resilience programming and for understanding whether projects designed to enhance resilience, such as the PRIME project, are actually doing so.

Attesting to the fact that the PRIME IE area is highly shock-prone, over 85 percent of households experienced a shock in the year prior to the baseline survey. According to the quantitative data, the most common shock experienced was an increase in food prices. The next most widely reported shocks were livestock and crop disease, drought, poor harvests, and increased prices of agricultural or livestock inputs.

However, according to the qualitative data, it is the increased threat of severe, recurrent drought, accompanied in recent years by heavy flooding, that people perceive as the biggest problem they face on a continuing basis. The combination of alternating droughts and flooding have increased the

frequency of shocks, and the dual nature of the shocks has increased stress on crop and livestock production. FG discussions reveal that people have moved from considering drought as a normal cyclical phenomenon that they were able to cope with to a more frequent disturbance that disrupts household stability and community life. Several female FGs noted that drought forces men to migrate with livestock, placing additional stress on families and increasing the burden on women. Shocks underlie an increase in localized conflict between different groups that live in close proximity to each other. Conflict over pasture and water is a long-standing issue, but is exacerbated during severe or sustained drought. Because of the need to avoid conflict, pastoralist households lose flexibility in their ability to make the best migration decisions to ensure their animals survive.

The quantitative data indicate that, taking into account the number of shocks and their perceived severity, households in Jijiga are more shock-exposed overall than households in Borena. This difference is mainly because Jijiga households are more likely to experience excessive rains, drought, and a variety of economic shocks. They are also more likely to experience the death of a household member. Though the types of shocks differ, overall shock exposure does not differ across the pastoralist, agro-pastoralist, and non-pastoralist groups.

## Resilience Capacity

Resilience is a set of capacities that enables households and communities to effectively function in the face of shocks and stresses and still meet a set of well-being outcomes. This section reviews the findings from the quantitative and qualitative data collected on a wide range of characteristics that contribute to resilience. It also presents a set of indices that assess the strength of resilience in the PRIME IE area.

**Ability to Recover and Coping Strategies.** Subjective reports of households' ability to recover from the actual shocks they experience is a key source of information on the strength of their resilience. The quantitative survey data reveal that most households felt that they had *not* recovered from the shocks they had experienced in the previous year. From the qualitative data, nearly all FG participants in Borena and Jijiga stated that shocks are becoming more frequent and are severely straining traditional coping strategies. These heightened shocks have motivated communities to undertake more cooperative activities to mitigate their effects, though people acknowledge that the scale of some shocks exceed their capacities. Households in Borena reported being better able to recover from shocks, especially economic shocks, than households in Jijiga. Pastoralists in particular, who comprise the largest population in Borena, are better able to recover from economic shocks than agro- or non-pastoralists. Pastoralists are also better able to cope with climate shocks through migration, though this often brings them into conflict with other groups.

Households in Borena and Jijiga use a similar narrow range of coping strategies in response to shocks, the most common ones being selling livestock assets, reducing food consumption, and relying on family members for loans. They avoid taking children out of school as a coping strategy, and do view migration as a last resort. A substantial minority of households rely on access to food-for-work or cash-for-work schemes of government or nongovernmental organizations (NGOs).

Focus group discussions (FGDs) revealed that in times of stress, women in Borena sell firewood and charcoal to buy food.

**Aspirations and confidence to adapt.** Aspirations and confidence to adapt are psychosocial capabilities that are thought to give people greater resilience in the face of shocks. They are examined in this report using three indicators—absence of fatalism, belief in individual power to enact change, and exposure to alternatives to the status quo—combined into an overall index.

According to the index, aspirations and confidence to adapt is slightly higher in Borena than Jijiga. The difference is due to stronger belief in individual power to enact change in Borena. There is no difference in the index across the pastoralist status groups. However, pastoralists are both more likely to have fatalistic attitudes and to believe in the individual power to enact change than agro- or non-pastoralists. Exposure to alternatives to the status quo is very low among all groups. The qualitative data show that the high degree of fatalism among households in both IE areas is countered by an equally strong belief in individual power to enact change. This duality mirrors opinions expressed in FGDs, that while there are factors outside of individual control, such as drought and flood, the households and communities that work hard and take measures to protect their assets will have better outcomes. Female FG participants voiced clear aspirations about gaining access to services and skills, which they believe will improve their livelihoods.

**Social capital.** The quantity and quality of social networks and access to larger institutions in society are critical resources that people need to survive and draw on to improve their livelihoods. Social interactions and networks in Borena and Jijiga are complex, with many traditional mechanisms for community cooperation and control. Informal support from relatives, neighbors, or friends (e.g., loans, gifts, or remittances) is received far more often than formal support from government or NGOs (e.g., food rations and food- or cash-for-work). A far higher percentage of households received social support of all kinds in the previous year in Borena than Jijiga. Borena households were also more likely to receive capacity building support (e.g., NRM training), which offers assistance for longer-term asset development.

Data were examined on three types of social capital:

- *Bonding social capital*, the links between community members
- *Bridging social capital*, which connects members of one community or group to other communities or groups
- *Linking social capital*, which is founded on vertical linkages between households/communities and some form of higher authority or power

All three types of social capital are much stronger in Borena than Jijiga, and stronger for pastoralists than for agro- and non-pastoralists.

**Livelihood diversification, ownership of productive assets, and access to markets, services, infrastructure, and information.** Livelihood diversification is important for resilience because it allows flexibility, reducing households' vulnerability in the face of shocks. Households in Borena

have a wider diversity of livelihood sources than those in Jijiga. FG interviews reveal that women in Borena who live near roads can now engage in petty trade to earn income and have diversified into raising chickens, though the latter is the only property over which they exercise full decision-making power. Among the pastoralist status groups, agro-pastoralists have the widest diversity of livelihoods, followed by pastoralists and non-pastoralists. Ownership of productive assets and access to markets, services, infrastructure, and information are equally important factors determining households' resilience. Though there are some exceptions (e.g., the availability of primary schools), throughout the IE area, these resources are limited. In general, conditions in this dimension of resilience are better in Borena than Jijiga, and better for pastoralists than agro- and non-pastoralists.

**Absorptive capacity, adaptive capacity, and transformative capacity.** Building resilience requires an integrated approach and a long-term commitment to improving these three critical capacities. Examination of mean values of indexes of the capacities across population groups confirm that, consistent with evidence reported earlier in this chapter, Borena households have higher resilience capacity than Jijiga households. However, female FG participants in Borena seemed less knowledgeable and less empowered for collective action than their male counterparts, while women in Jijiga reported that they are prepared to seek out educational opportunities for themselves. Pastoralists are more resilient than agro-pastoralists. Non-pastoralists tend to be the least resilient.

**Community resilience.** Community resilience is defined as the capacity of communities to absorb change, seize opportunity to improve living standards, and to transform livelihood systems while sustaining the natural resource base. It is measured in this study in relation to five types of collective action in which a community can engage: disaster risk reduction, conflict mitigation, social protection, NRM, and managing and maintaining public goods (e.g., schools, health clinics, and roads). Women reported that they specifically helped one another by sharing food and starting informal savings groups to help those in need. As with household resilience, community resilience is stronger in Borena than Jijiga.

## Links Between Shock Exposure, Resilience Capacities, and Well-Being Outcomes

Multivariate regression analysis is used to examine the relationships between shock exposure, both household and community resilience capacities, and key well-being outcomes of interest to the PRIME project: household food security and child nutritional status, the latter measured using the weight-for-height Z-score of children under 5.

**Effect of shock exposure on well-being outcomes.** The regression results for the experiential food security indicators (HFIAS and HHS) clearly indicate that shock exposure is associated with greater food insecurity, including hunger. Shock exposure has no association with calorie consumption. The data indicate that greater shock exposure is associated with better dietary quality, measured as dietary diversity. Some of the foods that are more likely to be eaten in the face of increased shock exposure (e.g., vegetables, eggs, milk, and milk products) have high micronutrient

and protein content, a positive sign that some households' dietary quality is protected during times of stress. The study did not find a statistically significant association between shock exposure and weight-for-height Z-score.

**Effect of household resilience capacity on well-being outcomes.** The regression results also confirm that the increased household resilience capacity, including absorptive capacity, adaptive capacity, and transformative capacity, leads to better food security. Households with greater resilience are likely to have higher food consumption, higher dietary diversity, reduced food insecurity overall (as measured using the HFIAS), and reduced hunger. These results are highly statistically significant and hold even after controlling for household wealth. In general, transformative capacity has a greater impact on food security than adaptive capacity, and adaptive capacity a greater impact than absorptive capacity. The study did not find a statistically significant association between household resilience capacity and weight-for-height Z-score.

The regression results support a positive role for household resilience in assisting households to withstand and recover from shocks. They indicate that shock exposure increases food insecurity and hunger, but that its negative influence is reduced the higher is a household's resilience capacity.

**Effect of community resilience capacity on well-being outcomes.** Community resilience does not appear to aid households in avoiding the less extreme forms of food insecurity, as indicated by statistically insignificant associations with calorie consumption, dietary diversity, and the HFIAS. However, the data imply that it does play a role in helping households to avoid hunger. (A significant association was found with the HHS.) Community resilience, as measured in the report, has no statistically significant association with weight-for-height Z-score. The limited influence of community resilience found is probably due to the fact that the strength of collective action is relatively low.

Overall, the regression results bear out the hypothesized relationships between shock exposure, resilience capacity, and household food security, a key well-being outcome. Shock exposure reduces household food security; resilience capacity bolsters it and helps to reduce the negative impacts of shocks on it.

## Differences in Key Indicators by PRIME IE Intervention Group

In order to evaluate the PRIME project, the sample for the baseline survey was divided into two intervention groups. The first group contains households residing in project communities, or *kebeles*, where interventions are projected to be implemented with low intensity (the LI group). The second contains households in *kebeles* where interventions are projected to be implemented with high intensity (the HI group). It is important to understand if there are any differences across these groups, because any initial (i.e., baseline) differences will need to be accounted for in the final evaluation of project impact. Results indicate that the main differences between these groups are (1) the HI group has a higher proportion of pastoralists and lower proportion of agro-pastoralists than the LI group; (2) expenditures poverty is lower for the HI group, but asset poverty is higher; and (3)

household resilience capacity is lower for the HI group. Shock exposure, food security, and child wasting do not differ across the groups.

## Next Steps

The FEEDBACK project will set up an interim monitoring system to capture real-time household and community responses to shocks and stresses as they occur over the next 4 years. The main focus of the interim monitoring activities is to assess household and community capacity to manage risk. The PRIME IE endline survey will take place near the end of project activities, in approximately 5 years. Data will be collected from the same households and communities as those surveyed for the baseline to enable an empirically valid evaluation of the impact the PRIME project has had on household resilience and well-being outcomes.

## Chapter I. Introduction

One of the main goals of the PRIME project is to enhance the resilience of households in one of the most shock-prone areas of the world: pastoral Ethiopia. This IE provides a unique opportunity to measure household and community resilience and to determine what kinds of interventions will work to maintain and improve households' livelihoods in the face of shocks.

### I.1 Feed the Future and FEEDBACK Overview

The impact evaluation is being undertaken as part of the FEEDBACK project. Feed the Future is a U.S. Government initiative that 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 Feed the Future. The high-level target of the initiative 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.”<sup>2</sup>

USAID contracted FEEDBACK to provide monitoring and evaluation support to the Feed the Future initiative. It is implemented by Westat in partnership with Technical Assistance to NGOs (TANGO) International and the Carolina Population Center at the University of North Carolina at Chapel Hill.

The main objectives of FEEDBACK are to enable USAID Missions to meet performance monitoring requirements of Feed the Future and maximize the use and benefits of the data collected; provide high-quality empirical evidence to inform program design and investment decisions that will promote sustainable food security; ensure timely availability of high-quality data for use in monitoring performance and evaluating impacts of the Feed the Future initiative; and facilitate accountability and learning about what Feed the Future interventions work best, under what conditions, and at what cost.

### I.2 Description of the PRIME Project<sup>3</sup>

The PRIME project has three interrelated objectives: increasing household incomes, enhancing resilience, and bolstering adaptive capacity<sup>4</sup> to climate change among pastoral people in Ethiopia, one of the 19 focus Feed the Future countries. To achieve these objectives, the project takes a multi-faceted approach through:

- Fostering the growth and competitiveness of livestock value chains

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<sup>2</sup> USAID. 2013.

<sup>3</sup> This description is from Mercy Corps (No date).

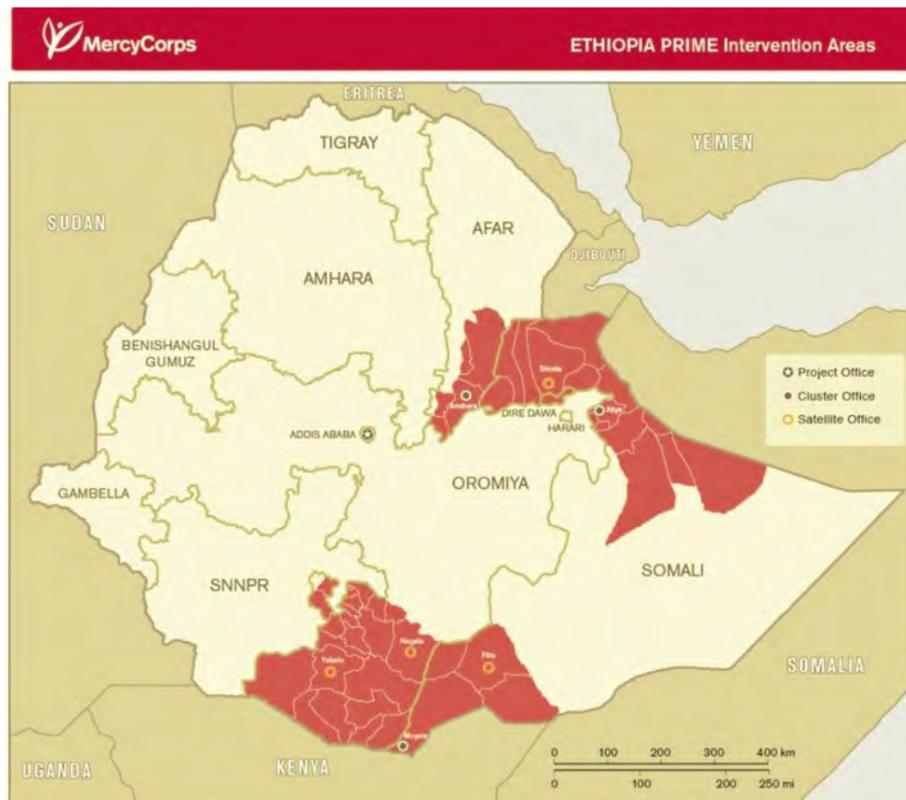
<sup>4</sup> Adaptive capacity is the ability to make proactive and informed choices about alternative livelihood strategies based on changing conditions.

- Addressing the needs of the very poor and chronically food insecure households through value chain interventions
- Improving the policy environment through a continuous and collaborative evaluation and learning process
- Improving delivery of human health services and behavior changes

The project seeks to assist pastoralists, non-pastoralists, and those transitioning between these extremes.

PRIME is being implemented in 23 *woredas* within three pastoral clusters (PCs) in Ethiopia, the Southern PC, the Somali PC, and the Afar PC (see Figure 1-1). 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 Shinile Zones of the Somali Region, and the Afar PC comprises Zone 3 of the Afar Region. The project is being implemented by Mercy Corps in partnership with CARE International, Kimetrica, Haramaya University, Pastoralist Concern, the Aged and Children Pastoralists Association, and SOS Sahel Ethiopia. It is a five-year project with activities commencing on October 15, 2012.

**Figure I-1. PRIME Project Intervention Areas**

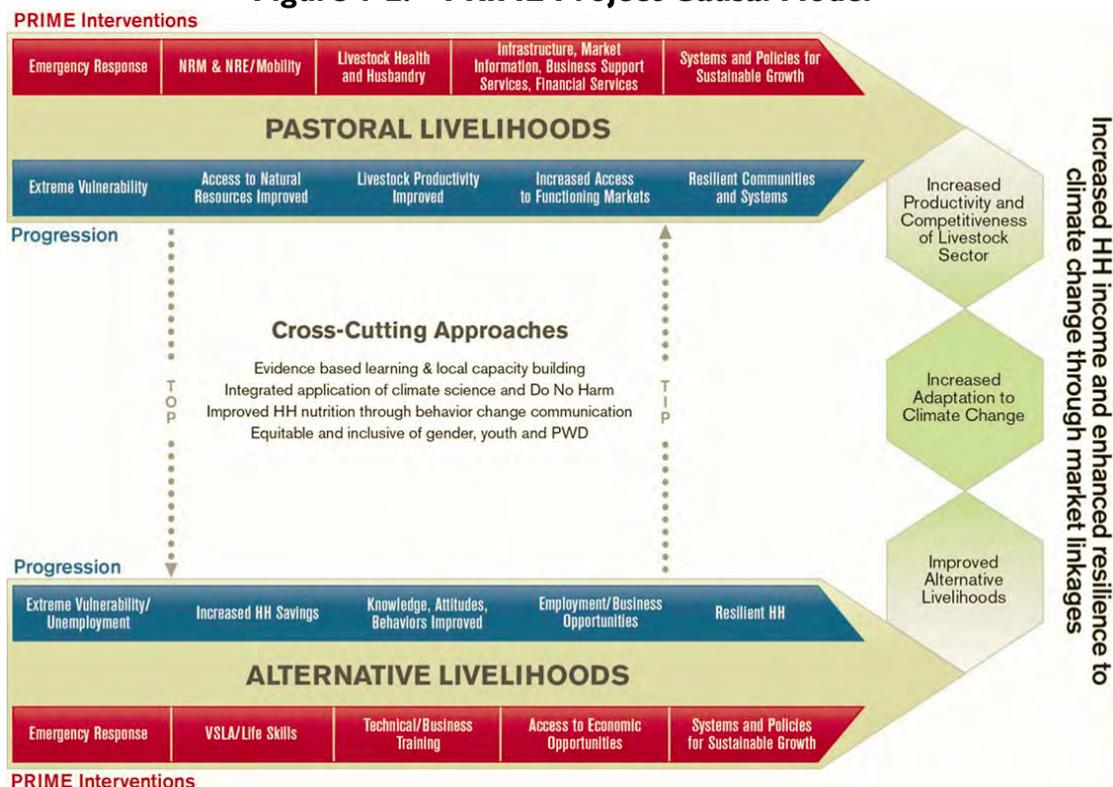


PRIME is employing both “push” and “pull” strategies. Push strategies work with communities, the private sector, and customary and formal institutions to ensure that resources important to the livelihoods of pastoralists are available and accessible. They include improving livestock health by

expanding animal health care services, increasing access to credit by expanding availability of Sharia-compliant banking services, increasing access to livestock markets, and improving market information and transportation systems. Pull strategies focus on the livestock industry. They include providing abattoirs, dairy value-added centers, other infrastructure related to markets, and expanding access of industry participants to commercial banks. The project expects to benefit 250,000 individuals, that is, all people living in project *kebeles*, including pastoralists, agro-pastoralists, and non-pastoralists.

Figure 1-2 presents the PRIME project’s causal model, which is founded on recognition of the key dynamics of households transitioning into pastoralism and transitioning out of pastoralism. (See Section 1.3.) These lines demonstrate how people in the dry lands actively move between livelihoods, responding to drivers of change (e.g., droughts and access to natural resources or markets), opportunities, and risks. Individuals in these pastoral areas may have multiple priorities and do not always proceed to resilience in a linear fashion. PRIME has tailored its interventions (shown in dark red in Figure 1-2) to variations in level of vulnerability, market capacity, and stage of the drought cycle. Whichever combination of livelihood options households choose, PRIME activities support them in increasing their incomes and resilience through increased productivity and competitiveness of the livestock sector, increased adaptation to climate change, and improved alternative livelihoods. Improved nutrition is being supported for all project households through behavioral change communication. It is also expected that many program activities will strengthen community resilience, especially in the collective management of natural resources.

**Figure I-2. PRIME Project Causal Model**



## I.3 General Overview of the Project Area Within the Broader Ethiopia Context

Despite rapid economic growth since 2004, Ethiopia remains a highly food-insecure country. While enough food is available nationally to satisfy the calorie needs of the population, the United Nations Food and Agriculture Organization (FAO) estimates that 37 percent of all people are undernourished. Furthermore, the quality of the available food is very poor, with 75 percent of calories coming from cereals, roots, and tubers.<sup>5</sup> Another manifestation of the poor food security situation is that a full 44 percent of children under 5 are stunted and 10 percent are wasted.<sup>6</sup>

The pastoral zones of Ethiopia within which the PRIME project's intervention areas are located are characterized by high mean temperatures, erratic and unpredictable rainfall, and patchy vegetation.<sup>7</sup> The scope for sedentary arable farming is limited in many parts of these zones. Nomadic and semi-nomadic pastoralists make efficient use of scarce natural resources to access food and earn income through the sale and consumption of livestock and livestock products (i.e., meat, milk, and hides).

For pastoralism to thrive over the long term, it requires dynamic and sustainable balancing of human populations, livestock populations, water, and rangeland resources. In Ethiopia, pastoral systems are under increasing pressures due to natural and man-made shocks that are leading to imbalance 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 agriculture<sup>8</sup> has reduced pastoralists' mobility, a key foundation of traditional risk management strategies, and made them increasingly vulnerable to shocks. Meanwhile, poor access to financial services (i.e., savings and credit) also reduces households' ability to cope with shocks and to recover their livelihoods when conditions improve. Fragmented market systems for inputs and support services (e.g., animal health services, veterinary supplies, quarantine and epidemiological control, livestock price information, off-take and abattoir facilities, and transportation) inhibit households from investing in more resilient and efficient production models. Output markets are also underdeveloped and distant.

An additional challenge is that increased competition for pasture and water has led to conflict in several locations, including within the PRIME project's operational area.

These pressures have led many pastoralists to transition out of pastoralism and seek alternative livelihoods. The transition is creating a dynamic of rural-urban migration in the project areas. It is also creating a dichotomy between poorer and richer pastoralists: Poor pastoralists are pursuing

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<sup>5</sup> Ethiopia ranks fifth from the bottom among all countries on this dimension. Its high percent signals that many people's diets are not meeting their needs for micronutrients and protein.

<sup>6</sup> FAO. 2014.

<sup>7</sup> This overview of the PRIME project area is summarized from Mercy Corps (No date).

<sup>8</sup> The increased presence of agriculture manifests itself in increased numbers of commercial farms and in private enclosure.

survival-oriented, low-cost input strategies for raising production and rich pastoralists are focusing more on increasing productivity by engaging in livestock-based market opportunities.

The households that transition out of pastoralism face a number of challenges. Families often send youth to peri-urban areas to diversify risk. Those sent to earn money or get an education to enhance future income earning often end up finding limited availability of jobs and other income-generating opportunities. Those transitioning out of necessity when pastoral strategies fail may be the least prepared to find alternative livelihoods. They are often older, lacking in formal education and the skills demanded by employers (e.g., numeracy, literacy, and technical), and have fewer contacts and support networks. They also face limited access to finance and other support services to start businesses. Pastoralist women, who are particularly disadvantaged in access to resources within the pastoral sector, are often the most vulnerable when seeking an alternative livelihood. Having limited opportunities to attend school or find work, they may resort to prostitution.

## 1.4 What Is Resilience?

This evaluation 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.”<sup>9</sup> According to this definition, *household* resilience is the ability of a household to mitigate, adapt to, and recover from shocks and stresses.

We use a more specific definition of community resilience, taken from a recent paper on the conceptualization and operationalization of community resilience. It states that “A community is resilient when it can function and sustain critical systems under stress; adapt to changes in the physical, social, and economic environment; and be self-reliant if external resources are limited or cut off.”<sup>10</sup> A defining feature of community resilience is the extent to which communities can effectively combine social capital and collective action in response to shocks and stresses.

## 1.5 The PRIME IE: Objectives and Research Questions

The PRIME IE focuses on the Jijiga Zone in the Somali PC and the Borena Zone in the Southern PC. In Jijiga, the emphasis of the project’s interventions is on livelihoods; in Borena, the emphasis is on NRM.

The overall objective of the IE is to determine the impact of the project’s push and pull interventions on pastoralist households’ resilience to shocks and, thus, on well-being outcomes, including poverty, food security, and children’s nutritional status.

The IE aims to answer six specific research questions:

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<sup>9</sup> USAID. 2012a.

<sup>10</sup> Frankenberger, T., Mueller M., Spangler T., and Alexander S. 2013.

1. Which PRIME interventions improve the ability of vulnerable households to withstand stressors and shocks affecting their economic activities? In what ways? (Ability to withstand is defined as stable consumption/food security and protected assets.)
2. What interventions strengthen the ability of vulnerable households to recover from common and extreme shocks?
3. To what extent do different interventions to promote market access generate the participation of poorer households?
4. What PRIME interventions on both the push and pull sides improve the participation of the poor in value chain activities? Which value chains exclude the poor and women? Which value chains are generally more stabilizing (i.e., reduce vulnerability because they are counter cyclical or not strongly influenced by drought) and which are more cyclical??
5. What are the relationships between household and community resilience?
6. Have interventions strengthened risk-reduction strategies pursued by men and women to cope with shocks (e.g., agro-climatic, health, economic, and socio-political)?

## 1.6 Baseline Survey Objectives

The baseline survey analysis in this report has four objectives. The first is to understand the livelihood environment in which households' resilience is determined in the evaluation areas. The second is to provide baseline estimates of indicators of household well-being outcomes, shock exposure, and resilience capacities. To meet the first two objectives, differences across the two project areas of focus in the IE (Borena and Jijiga) and among pastoralists, agro-pastoralists, and non-pastoralists are explored.

The third objective is to explore baseline differences across the IE comparison groups that will be used to measure the PRIME project's impact at the time of the endline survey. The last objective is to investigate the relationships between household outcomes, shock exposure, and resilience capacities in the PRIME project area.

## 1.7 Organization of the Report

Chapter 2 discusses the baseline survey data collection and analysis methodologies. Chapter 3 provides an overview of the household and community livelihood environment in Borena and Jijiga. Chapter 4 provides baseline values of the main well-being outcomes, and related discussion and presentation of qualitative data that describes how well different population groups are doing based on these outcomes. Households' and communities' shock exposure is examined in Chapter 5. Chapter 6 presents the core data on household and community resilience. The final results section, Chapter 7, uses regression techniques to understand the links between household shock exposure, resilience, and well-being outcomes in the IE area. The last section provides conclusions and lays out the next steps in the PRIME project IE.

## Chapter 2. Methodology

This chapter outlines the methodology used for collecting the PRIME IE baseline data. It also describes the methods for analyzing the quantitative and qualitative data collected.

### 2.1 Data Collection

#### Objectives of the Data Collection

The PRIME IE baseline has two quantitative components—a household and a community survey—accompanied by a qualitative component. The data were collected with two main objectives in mind. The first was to collect appropriate data on three key sets of variables of interest: household well-being outcomes (including poverty, food insecurity, and child malnutrition), household shock exposure, and household and community capacities that promote resilience. Additional complementary data were collected on subjects such as households’ livelihood environments and how they are affected by shocks.

The second objective was to collect data that will allow evaluators to determine project impact after the endline data collection has been completed. These techniques are propensity score weighted regression with first-differencing, propensity score matching, and double-difference estimation. As a set, they require panel data and that data be collected for “control” and “intervention” groups of households. Consultation with PRIME project staff regarding the manner in which the project is being implemented led to the decision to define these groups around the intensity with which project interventions would be implemented in *kebeles*. The intervention group would be households residing in *kebeles* with high push-pull intervention intensity. The control group includes households in *kebeles* with low push-pull intervention intensity. (See the survey sample design section below.)

#### Quantitative Survey Instruments

TANGO staff developed the quantitative survey questionnaires with input from Westat and USAID counterparts. The household survey questionnaire contains 22 modules with the following topics:

1. Household roster and demographics
2. Shocks
3. Assets and consumption expenditures
4. Access to markets, services and information
5. Resilience capacities
6. Food security and nutrition

The topics covered in the community survey include:

1. Community characteristics
2. Community infrastructure and services
3. Community organizations
4. Government and NGO programs

5. Shocks
6. Land tenure
7. Governance

The development of some questionnaire modules was informed by previous surveys in Ethiopia and bordering countries, including the PRIME baseline survey conducted by Kimetrica and the Southern Somalia Resilience and Stabilization Study conducted by Mercy Corps and TANGO. Several modules were modeled on those of Feed the Future/FEEDBACK population-based surveys. The consumption expenditures module was based on the standard module used in the population-based surveys with modification to render it relevant to the items consumed by the survey population. Staff from the Central Statistical Agency of Ethiopia (CSA) helped determine which items to include. As indicated in the relevant report sections, some modules are based directly on suggested data collection techniques found in measurement manuals for specific indicators, such as the HFIAS and the HHS. A range of resources developed by TANGO and Feed the Future were drawn upon to develop the questionnaire modules for collecting data on resilience, for which measurement techniques are in their nascent stage.

## Qualitative Survey Instruments

The qualitative component of data collection focused on capturing contextual information about resilience and the impact of shocks in order to understand and explain outcomes, as well as to interpret the quantitative findings. In particular, qualitative findings help explain how households and communities perceive change, how they define resilience, and how they view the challenges to livelihoods posed by shocks and stresses. TANGO developed topical outlines with USAID staff and included questions on coping strategies, social capital, and aspirations in order to provide in-depth information about how households use community resources to manage shocks. The qualitative component also sought information about households' experience with the PRIME project and potential pathways through which the interventions might lead to outcomes.

Qualitative data collection involved separate FGs of men and women, from sub-groups of interest where appropriate [e.g., youth, unemployed people, and from participants in special programs such as the government's Productive Safety Net Program (PSNP)]. FGDs were conducted with representative groups from the primary livelihood systems and wealth ranking categories in the community. Groups varied somewhat in size, with efforts made to limit them to 8-10 people. FG facilitators used the topical outlines to guide discussion, with focus on the nature of shocks and stresses experienced by the community and common responses to them. Particular emphasis was given to individual and household engagement with formal and informal institutions and factors influencing the community's capacity for collective action. Key informant interviews (KIIs) were conducted simultaneously or immediately following FGDs. Key informants were selected based on their special knowledge of some aspect of the population being surveyed and included *woreda*-level government officials responsible for relevant agriculture, livestock, and other food security programs; local individuals involved in private agro-pastoral trade and/or processing; providers of

public services (e.g., health, education); or local resource persons employed by other development actors in the area, for example government and NGOs implementing projects.

## Survey Sampling Design

The evaluation focused on a sub-set of participants in two focus areas (Jijiga and Borena) rather than the entire target population to allow for a closer measurement of a smaller group of households, saving costs and producing more valuable insights. The evaluation design team was also encouraged by the USAID/Ethiopia Mission to select these areas to carry out a dual-focused IE, where one dimension would focus on NRM in Borena and the second would focus on improvements in livelihoods and market-enabling conditions in the Somali region.

The sampling design for the PRIME IE baseline was planned with the need to collect data for the two intervention groups—high intensity (HI) and low intensity (LI)—within both Borena and Jijiga. The sample was drawn from four strata:

- Borena high intensity (Borena HI)
- Borena low intensity (Borena LI)
- Jijiga high intensity (Jijiga HI)
- Jijiga low intensity (Jijiga LI)

To construct a sampling frame from which sample households would be chosen, PRIME project staff were asked to rank the level of intensity of three project interventions from 1 (least intense) to 5 (most intense) for each of the 112 *kebeles* in the IE area.<sup>11</sup> The interventions are increased livestock productivity activities, increased livestock market demand activities, and improved NRM 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. Table 2-1 shows the number of *kebeles* and households in each of the four strata after the ranking. The approximate number of households was determined from data provided by CSA collected in the latest Ethiopia census (the 2007 Population and Housing Census of Ethiopia).<sup>12</sup>

**Sample selection.** Sample selection was based on a two-stage, stratified random sampling design. In stage one of sample selection, sample enumeration areas<sup>13</sup> were selected within each stratum using probability proportional to size sampling. In the second stage, households within each enumeration area were selected randomly from household listings. Note that the planned empirical technique for the impact evaluation necessitated that within each of the two study areas, one-third of the

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<sup>11</sup> The designation of the intervention groups was based on the anticipated level of intensity with which project interventions will be implemented. Given the changing conditions in this shock-prone area, it is possible that the actual level of intensity of implementation will be different for some *kebeles*. The degree of intervention intensity will be objectively evaluated as part of the endline survey, and any divergences from plan will be accounted for in the calculation of endline statistics and the impact evaluation analysis.

<sup>12</sup> CSA. 2007.

<sup>13</sup> For the 2007 census data, the enumeration areas are the smallest geographical unit for which population data were collected. There may be several enumeration areas in each *kebele*.

households be selected from the HI intervention stratum and two-thirds from the LI intervention stratum.<sup>14</sup>

**Table 2-1. Number of Kebeles and Households in Each Survey Stratum**

	Borena	Jijiga
<b>Number of kebeles</b>		
High push-pull intervention intensity group	19	19
Low push-pull intervention intensity group	45	29
<b>Number of households</b>		
High push-pull intervention intensity group	12,475	9,412
Low push-pull intervention intensity group	38,459	11,019

**Sample size calculation.** The size of the household survey sample was chosen in order to be able to detect a 20 percent reduction—a change from 50 to 40 percent—in a key outcome variable of interest, the prevalence of poverty, between the baseline and endline surveys.<sup>15</sup> To do so, the minimum sample size required for each of six equally sized cells was calculated: the two HI groups and two each within the LI groups (to maintain the 1/3 to 2/3 balance). The sample size was chosen within the parameters of 90 percent confidence ( $Z_{\alpha}=1.282$ ), 80 percent power ( $Z_{\beta}=0.840$ ), and a design effect of 2.0.<sup>16</sup> The calculated minimum was 441 households for each cell. A 10 percent upward adjustment was made to account for the possibility of drop-out communities and household-level non-response. Given that the PRIME survey is a panel survey, an additional 10 percent upward adjustment (for a total 20 percent upward adjustment) was made to account for possible attrition between the baseline and endline surveys, giving a minimum total target sample size of 529 households per stratum. After implementation of the baseline, we would expect a minimum sample size of 485 households in each cell, for a total of 2,910 households in the baseline sample. The target for the HI groups within regions was 485; it was 970 for the LI groups (2 x 485).

A community survey was administered in each *kebele* in the sample. It was administered at the *kebele* level, rather than the enumeration area level, because it is at the *kebele* level that most existing services are provided and PRIME project interventions are being implemented.

**Sample weights.** For each of the four strata, the household-level sample weights were calculated as the inverse of the selection probability of a household. They are a ratio of the proportion of the

<sup>14</sup> The reason a greater number of sample households were selected in the low intensity groups is to be able to have sufficient matches for high-intensity households to employ the Propensity Score Matching technique.

<sup>15</sup> The actual prevalence of poverty, using the \$1.25 per person per day cut-off, was not known at the time of the sample size calculation. However, given knowledge of conditions in the area, it was anticipated that it would be much higher than the average in Ethiopia (31%, World Bank 2014), and thus 50 percent was chosen as the probable prevalence. In actuality, as will be seen in Section 4 of this report, the poverty prevalence is 56.3 in the PRIME IE area. A 20 percent reduction from this prevalence would result in a 45 percent poverty prevalence; the sample size required to be able to detect this difference is slightly less than that actually planned for.

<sup>16</sup> The design effect is a measure of the extent to which the sampling error in a survey departs from the sampling error from simple random sampling (Surveyanalysis.org 2014). Note that the actual design effect associated with the estimate of the prevalence of poverty in the PRIME IE area is 2.64, which would necessitate a somewhat larger sample size than planned.

entire population of households that is in the stratum to the proportion of sample households that are in the stratum. The community-level sampling weights were calculated in the same manner. There is one survey module for which data were collected for children under 5 (on anthropometry and children’s milk consumption). The weights applied to these data are the household-level weights for each stratum divided by the child-level non-response rate.

Table 2-2 shows the actual number of households and communities in the PRIME IE baseline sample along with the sampling weights that were used throughout the analysis to ensure that population-level estimates were representative of the population as a whole. There was a sufficient number of households to meet the targets in all strata except the Jijiga HI group, for which the sample size was quite below target because of the drop out from the survey of an entire *woreda* in Jijiga, the Babile *woreda*, due to a conflict. Eighty percent of the *kebeles* in this *woreda* had been classified as HI *kebeles*.

**Table 2-2. The PRIME IE Baseline Sample: Sample Size and Number of Households and Communities in Each Stratum**

	All	Borena		Jijiga	
		High Intensity	Low Intensity	High Intensity	Low Intensity
<b>Household survey</b>					
Number of households	3,142	587	1,157	388	1,010
Sample weight		0.94	1.46	1.07	0.48
<b>Community survey</b>					
Number of communities	75	14	29	11	21
Sample weight		0.55	1.25	0.70	1.11

## Enumerator Training, Field Schedule, and Details of the Qualitative Data Collection

Prior to enumerator training, Westat, TANGO, and a private Ethiopian firm, Green Professional Service (GPS), conducted two training-of-trainers workshops in Addis Ababa, one for the qualitative survey trainers and one for the quantitative survey trainers.

Enumerator training followed, and took place in two field locations: Jijiga Town in Jijiga and Yabello in Borena. Registered nurses with experience training in the correct use of scales and measuring boards conducted training for the anthropometric modules and helped in the data collection. CSA staff trained enumerators in how to conduct household listings using the techniques employed for national censuses. In addition, the in-country team translated the questionnaire into local languages (Somali and Oromiya). Trainers and enumerators developed paper-based local language versions of the questionnaire, which were used in conjunction with the Nexus tablets to administer the survey.

The main objective of the training was to ensure that all members of the survey teams understood the objectives of the study, proper use of the survey tools, and the roles and responsibilities of each team member in data collection. Training covered detailed review of paper survey questionnaires in

local languages, procedures for conducting research on human subjects, and instructions using the tablets. Two days of pretesting followed. During the training and pretest period, problems found in the translations and the tablet version of the questionnaire were corrected. All trainers and enumerators were fluent in local languages, Amharic, and English.

The actual data collection took place in Jijiga from November 20 to December 24, 2013, and from November 19 to December 23, 2013, in Borena.

The qualitative component of data collection took place in tandem with the quantitative survey field work. Qualitative teams consisted of eight people in two teams of four, one team per region. The teams were gender-balanced and multidisciplinary. Six villages were selected from three *woredas* in Borena and from two *woredas* in Jijiga (Table 2-3). In all, 12 focus groups (six female, six male) were conducted in each *woreda*. A total of 19 KIIs were conducted in Jijiga and 11 in Borena. KIIs were conducted with animal health experts, health workers, development agents, religious leaders, community leaders, *kebele* chairpersons, cooperative members, school directors, and staff from government agencies and local NGOs.

**Table 2-3. Kebeles Selected for Focus Groups and Key Informant Interviews**

Jijiga		Borena	
Woreda	Kebele	Woreda	Kebele
Gursum	Kudamatana	Teltele	Dembe Gaya
	Tikdem		Sarete
Kebri Beyah	Halahago	Miyo	Melbana
	Gerbi		Miyo
	Fadega	Yabelo	Surupa
	Alabaderu		Dida Hara

Identification of participants for FGDs and KIIs was overseen by GPS in conjunction with CSA representatives, local government officials, and Mercy Corps field staff. The team placed priority on identifying key informants and FG participants who were representative of the primary livelihood groups and resilience categories in each location. Across individual locations, efforts were made to select communities that reflected diversity in terms of poverty/wealth status, access to infrastructure and services, ecological conditions, and engagement with formal and informal institutions. In addition, interviews with positive deviants were conducted to try and understand what helps make an individual or a household more resilient than others. The positive deviants were identified by villagers as being able to successfully manage shocks. Five positive deviant interviews were conducted in Jijiga and four in Borena.

Each of the eight qualitative facilitators and their respective supervisors participated in the qualitative training, which allowed qualitative enumerators to become familiar with each other as team members and to gain understanding of the goals and objectives of the PRIME project. The training also provided a sound conceptual understanding of resilience at the household and

community levels and a means of qualitatively assessing it. Training focused on gaining an in-depth understanding of the qualitative research instruments (topical outlines) and interactive methods.

The team comprised four qualitative facilitators (two men, two women) and a supervisor assuming responsibility for Jijiga, and four qualitative facilitators (two men, two women) and a supervisor assuming responsibility for Borena. Interviews were conducted by teams of two, with one person conducting the interview and one taking notes. During fieldwork, qualitative teams debriefed daily to ensure monitoring by supervisors of the performance of individual facilitators and note takers, and for the team to discuss emerging issues and lines of questioning.

## Challenges Encountered During Training and Data Collection

A number of challenges were encountered that either delayed the data collection, led to the need to replace *kebeles* or enumeration areas within them with others in the same *woreda* (and intervention group), or the need to drop an entire *woreda* from the sample.

Upon arrival in Addis Ababa, all Nexus tablets were retained by Ethiopian customs, which delayed the training-of-trainers. In response, TANGO and GPS staff worked closely with the CSA and Ethiopian customs to ensure the tablets were released in time to do the survey.

In Jijiga, additional data collection delays were due to a number of factors, including delays in transporting tablets from Addis Ababa, local government intervention, security concerns arising from violent conflict, and time-consuming security procedures. Even though CSA was a partner on the survey, the regional Ministry of Finance and Development halted enumerator training to assess the purpose and need for the baseline data collection. The Ministry interviewed each enumerator to determine language proficiency, eventually replacing 17 enumerators hired by GPS with local residents. In addition, due to heightened security concerns in the region, local security forces routinely stopped and held survey vehicles, some for up to a day, and in one case arrested a hired driver. Enumerators were also frequently stopped and questioned throughout the baseline data collection. These inspections, in addition to imposed curfews, further slowed field work. To address these difficulties, additional enumerators were assigned to this region and the length of the survey was extended.

In Borena, different constraints slowed survey implementation. Throughout fieldwork, electricity was very limited because of a broken regional transformer, which made it difficult to keep the tablets charged. In addition, there was initially no Internet service in the area. After several days, TANGO and GPS staff arranged with the local telecommunications company and a business owner to provide wi-fi to the project for 30 days. However, wi-fi service remained intermittent. GPS purchased hot spots, which would have used the cell phone network instead of wi-fi, but the Ethiopian telephone company did not activate them in time for fieldwork. In remote survey regions of Borena, complete lack of Internet access further complicated survey administration. In response to these challenges, extra training was provided to supervisors and team leaders on how to manually transfer back-up surveys from tablets to laptops, and to manually load survey forms onto each

tablet, thus ensuring that the lack of Internet access did not compromise the quality of the data. Survey data were transmitted to the Westat server whenever the team had Internet access.

Survey administration was delayed in both Jijiga and Borena due to highly dispersed populations common to pastoral areas, poor road conditions, and settlements off the road system. Some enumeration areas were dropped from the survey or replaced due to weather conditions and outbreaks of violence.

Last, collecting appropriate age data for the measurement of malnutrition among children under 5 proved to be challenging. To measure two indicators, the prevalence of child stunting and the prevalence of child underweight, it is necessary to know the age in months of each child deemed to be less than 6 years old. However, the majority of respondents did not know their child's age in months or their child's birth date, and official documents such as vaccination records with dates of birth on them were not available. Thus, age-appropriate age data were collected for only 23.4 percent of the children that were weighed and measured as part of the anthropometric data collection. Due to this limitation, it was not possible to include stunting and underweight in the analysis of this report. It was, however, possible to include a measure based only on weight and height (or length), the prevalence of wasting.

## Country Approvals Obtained and Respondent Informed Consent

Country approval was obtained from CSA on August 16, 2013. To obtain informed consent to participate, all respondents were read a statement regarding the purpose and content of the survey and how long it would take to complete. They were informed that participation was voluntary and their answers confidential. Following the reading of the consent form, respondents were asked whether they agreed to participate and to place their signature or mark on an informed consent document.

## 2.2 Analysis of the Quantitative Data

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

### Descriptive Analysis

In the report, the baseline household and community survey data are used to conduct descriptive analysis of indicators describing households' livelihood environments (Chapter 3), well-being outcomes (Chapter 4), shock exposure (Chapter 5), and resilience capacities (Chapter 6). Indicator values are mainly reported as percentages and means.

- **Percentages.** For values provided in nominal scales (e.g., yes/no responses), percentages were computed using the weighted number of cases that provided a given response as the numerator, and the total weighted number of cases as the denominator.

Single-response variables add up to a maximum of 100 percent; multiple response variables may total more than 100 percent.

- **Means.** For variables calculated in a continuous scale format (e.g., number of household members), means were computed using the weighted sum of values as the numerator and the total weighted number of cases as the denominator.

Indicators are reported by key population sub-groups, and tests for statistically significant differences in the indicators across the groups are undertaken. Differences are considered significant if statistically significant at the 0.05 level. The population sub-groups for which values of variables are reported differ when household-level data are reported than when community-level data are reported.

For household-level data, the population sub-groups are:

- PRIME IE region: Borena or Jijiga
- Pastoralist status: Pastoralist, agro-pastoralist or non-pastoralist
- Intervention group: HI group or LI group

For community-level data, the population sub-groups are:

- PRIME IE region: Borena or Jijiga
- Intervention group: HI group or LI group

Some indicators are also disaggregated by household poverty status. The classification of households into pastoralist status groups<sup>17</sup> and poverty groups is explained in Box 1. The measurements of the other variables employed in the descriptive analysis will be explained in detail as they are introduced in the report.

The sample size was chosen such that the number of observations used in each calculation would be in most cases sufficient for calculation of these statistics. Any cases where the number of observations was too small for reliable measurement ( $n \leq 30$ ) are denoted in the tables, and variable values are not reported.

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 the survey sampling weights.

Some important variables of interest (e.g., resilience capacities) are composite measures based on multiple other measures. In many of these cases, Principal Components Analysis (PCA) or polychoric factor analysis are used to construct an index. These techniques reduce a set of “input” variables that are hypothesized to be related to one another to a single variable by detecting structure in the relationships among the input variables from their correlation matrix. PCA is appropriate to

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<sup>17</sup> The percent of the total sample falling into each of the groups is as follows: pastoralists: 30.9, agro-pastoralists: 42.7, non-pastoralists: 26.5. Note, however, that this breakdown does not represent the percentages in the *population* because the sampling weights have not been applied. The percentages in the population are reported in the first section of Chapter 3.

use when all of the input variables are continuous. Polychoric factor analysis<sup>18</sup> is the PCA analog that is appropriate to use when some variables are binary or ordinal. For both, the variables are combined using weights that represent their correlations with the single variable produced. Indexes are constructed using this technique only if the signs of the weights for the input variables are as expected (positive or negative) given our conceptual understanding of the relationships between the input variables and the indicator being measured.

### ***BOX 1: Classification of Households into Pastoralist Status and Poverty Groups***

#### **Pastoralist Status**

Pastoralist households are often defined as those that derive more than 50 percent of their incomes from livestock and livestock products. Agro-pastoralists are those that derive more than 50 percent of their incomes (Swift 1988) from farming but most of the rest (from 25 percent to less than 50 percent) from livestock and livestock products. For this report, in the absence of such precise information, we rely 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. The pastoralist status groups are defined as:

- **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.
- **Non-pastoralist:** Livestock production and sales is not a source of food or income. This category also includes 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.

For the small number of sample households (n=63) for which livelihood activity rankings are not available, supplementary information on the primary occupation of household members older than 10 and the reported number of livestock owned are used for classification.

#### **Poverty Status**

As explained in detail in Chapter 4, appropriate measurement of pastoral households' poverty status requires measurement of two kinds of poverty: income poverty and asset poverty. Income poverty tells us whether a household currently has sufficient resources to obtain enough food and meet its other basic needs. To measure income poverty, household incomes are measured using their total expenditures on food and non-food items, and the \$1.25 per day cut-off is used to identify poor households. Asset poverty measures long-lasting, structural poverty. It is particularly relevant to the dynamics of shock-prone settings such as the PRIME project area because asset holdings are a resource for meeting basic needs when households are faced with a negative shock. Asset poverty is measured using data on the ownership of agricultural productive assets, animals, and consumer durables.

Note that for all indexes constructed in this report, the first principal component (or equivalent for polychoric factor analysis) is used to construct the index. This component, which accounts for as much of the variability in the data as possible, always turns out to be the one for which the input variables enter with the appropriate sign—a positive indication of the conceptual validity of the indicators.

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<sup>18</sup> Kolenikov and Angeles. 2004.

## Multivariate Analysis

In Chapter 7, multivariate regression analysis is used to investigate the structural relationships that are hypothesized to exist between key variables of interest (well-being outcomes, shock exposure, and resilience capacities) for this population. Specifically, the following questions are investigated:

1. How are household food security and child malnutrition affected by household shock exposure?
2. How are these well-being outcomes affected by household<sup>19</sup> and community resilience capacities?
3. Does greater resilience capacity reduce the negative impact of shocks on well-being outcomes?

To investigate the first question, the following equation is used:

$$hh\ outcome = f(SE, household\ characteristics, community\ of\ residence) \quad (1)$$

where *SE* is a shock exposure index and the household characteristics controlled for are household demographic characteristics (adult equivalents, age-sex composition, gendered household type), education, and an index of asset ownership. (See Chapter 7 for details.) This is a “community fixed effects” model, whereby community of residence is controlled for and thus factors at the community level that influence the outcome variable.

The regression equations used to investigate the second question about household resilience capacity (HRC) and community resilience capacity (CRC) are:

$$hh\ outcome = f(HRC, household\ characteristics, community\ of\ residence) \quad (2)$$

$$hh\ outcome = f(CRC, household\ characteristics) \quad (3)$$

The regression equations used to investigate the third question are:

$$hh\ outcome = f\left(\begin{matrix} SE, HRC, SE * HRC, household\ characteristics, \\ community\ of\ residence \end{matrix}\right) \quad (4)$$

$$hh\ outcome = f(SE, CRC, SE * CRC, household\ characteristics) \quad (5)$$

The interaction terms between shock exposure and the measures of resilience capacity help to determine whether greater resilience capacity reduces the negative impact of shocks on well-being outcomes.

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<sup>19</sup> It was not possible to analyze the data by gendered household type because the number of female-headed households was too small in the sample (11.4 percent) to generate statistically valid results.

## 2.3 Analysis of the Qualitative Data

The qualitative information from the FGD, KII, and positive deviant interviews 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 three data sources to cross-check the reliability of information and to identify differences in perception between groups based on gender, social or economic status, and ethnic group.

Specific research questions guiding the qualitative analysis included:

1. What risk management strategies are used at the household and community levels to deal with shocks?
2. Are there any cultural, ethnic, and/or gender- based barriers that exclude the most vulnerable from social networks and markets?
3. How do community-level structures hold up under shocks?
4. What are the relationships between community responses and household responses to shocks?
5. Are there any gender differences in the impact of shocks?

## 2.4 Integration of Quantitative and Qualitative Analyses

The qualitative data analysis was used to interpret and supplement the quantitative results throughout the baseline report. It is integrated with quantitative findings to provide a more comprehensive and contextually specific picture of resilience dynamics at the local level. The qualitative data gives a voice to the people living in IE areas by reporting their own words on important topics addressed using quantitative techniques. For instance, qualitative analysis findings provide insight into government policies and programs influencing the resilience of target populations, local market dynamics, community social capital and relations with neighboring communities, savings and borrowing activity, spillover effects of other development projects, and social and economic characteristics of distinct populations. Qualitative analysis also complements quantitative findings at the community and household levels by describing how social capital functions in the wake of shocks, including ways in which unequal power relations and unequal access to resources influence the ability of households to build and draw upon social capital.

## Chapter 3. Household and Community Livelihood Environment

The PRIME project area lies primarily in the Arid and Semi-Arid Lands where pastoralism and agro-pastoralism are the dominant livelihoods. These areas have unpredictable and low rainfall (less than 600 mm/year) and are characterized by dispersed populations with little infrastructure. People in these areas are experiencing environmental degradation, climate change, and entrenched conflict. There is also much diversity within pastoral communities and cross-border pastoralist ecosystems, further complicating trans-border disputes in an increasingly fragile environment. Traditionally, transhumance<sup>20</sup> was a common feature of pastoral livelihoods that enabled pastoralists and agro-pastoralists to be highly resilient to drought. However, rapid population growth, drought, land degradation, and conflict have made this strategy more difficult. Vulnerability has increased among pastoralist and agro-pastoralists because their traditional livelihood strategies and coping mechanisms are difficult to carry out. The relative isolation of these communities, their lack of access to productive infrastructure, and their marginalized status add to their vulnerability.<sup>21</sup>

This chapter presents PRIME IE baseline survey results on the household and community livelihood environment for the overall population, project area, pastoralist status, and PRIME intervention groups. The results by intervention group will be discussed in the final sub-section.

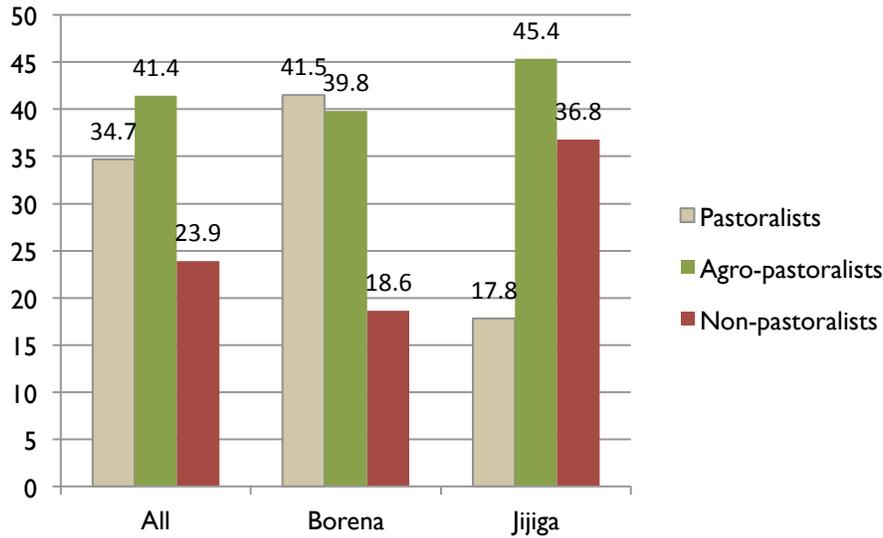
Pastoralism and agro-pastoralism are defining features of the livelihood environment in the PRIME IE area, and it is important to understand their prevalence within the surveyed population. Figure 3-1 gives the percentage of households in the population and in Borena and Jijiga by pastoralist status groups as defined in Chapter 2. Pastoralists make up 35 percent of the population, agro-pastoralists more than 40 percent, and non-pastoralists nearly one-quarter. The two regions have quite different pastoral status profiles. Forty-two percent of households are pastoralist in Borena while only 17.8 percent are in Jijiga. Both regions have a strong presence of agro-pastoralist populations. The presence of non-pastoralist households is much higher in Jijiga, which is closer to an urban regional capital and less isolated than Borena.

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<sup>20</sup> Transhumance is defined as “regular seasonal movements of livestock between well-defined pasture areas (dry to wet season, or low to highland)” (Niamir-Fuller 1999).

<sup>21</sup> African Union. 2010.

**Figure 3-1. Percent of Pastoralists, Agro-Pastoralists, and Non-Pastoralists, by Project Area**



### 3.1 Demographic and Housing Characteristics

Table 3-1 presents household demographic information collected from the survey’s household roster module. Overall mean household size is 5.7, with little variation between locations or by pastoralist status. The age structure of households is similar across the PRIME IE area, with just under one-half of households below age 15 and about one half between 15 and 64, the group from which a large portion of the work force derives. This age distribution is similar to all of Ethiopia,<sup>22</sup> although the percentage of people in the youngest age group is somewhat higher in the IE area.

Just over 10 percent of all households have a disabled member, equally distributed among males and females. The presence of disability does not differ significantly across the population groups.

Eighty-six percent of households include a male and female adult, though 11.4 percent have only female adult members. Notably, there are nearly twice as many female-adult-only households—which can be especially vulnerable to shocks—in Borena than in Jijiga, and three times as many male-adult-only households in Jijiga than in Borena. Almost 20 percent of all non-pastoralist households are female-adult-only households.

<sup>22</sup> CSA and ICF International (2012).

**Table 3-1. Household Demographic Characteristics**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
<b>Household size and age-sex composition</b>								
Household size	5.7	5.7	5.7	5.8 <sup>a</sup>	5.9 <sup>b</sup>	5.0 <sup>ab</sup>	5.6	5.7
% females 0-14	42.8	43.5 <sup>a</sup>	40.9 <sup>a</sup>	43.4 <sup>a</sup>	44.3 <sup>b</sup>	39.3 <sup>ab</sup>	42.7	42.9
% females 15-64	51.8	50.5 <sup>a</sup>	55.3 <sup>a</sup>	51.1	53.1	50.6	51.9	51.8
% females 65+	5.2	5.7 <sup>a</sup>	3.8 <sup>a</sup>	5.4 <sup>a</sup>	2.6 <sup>a</sup>	9.4 <sup>a</sup>	5.2	5.1
% males 0-14	45.4	46.4 <sup>a</sup>	43.1 <sup>a</sup>	44.7	44.9	47.6	45.7	45.0
% males 15-64	49.3	47.9 <sup>a</sup>	52.7 <sup>a</sup>	48.8	51.0 <sup>a</sup>	46.9 <sup>a</sup>	48.9	50.1
% males 65+	5.1	5.5	4.2	6.4 <sup>a</sup>	4.1 <sup>a</sup>	5.0	5.2	4.9
<b>Percent of households with a disabled member</b>								
Any disabled member	10.4	10.4	10.3	10.6	9.2	12.3	10.1	11.0
Female disabled member	5.6	5.7	5.2	5.2	4.8	7.6	5.6	5.7
Male disabled member	6.0	5.8	6.3	6.6	5.0	6.8	5.6	6.8
<b>Gendered household type (%)<sup>d</sup></b>								
Male and female adult households	86.0	85.3	87.7	87.2 <sup>a</sup>	90.4 <sup>a</sup>	76.3 <sup>a</sup>	85.5	87.0
Female adult only households	11.4	13.0 <sup>a</sup>	7.3 <sup>a</sup>	11.5 <sup>a</sup>	7.4 <sup>a</sup>	18.2 <sup>a</sup>	11.9	10.2
Male adult only households	2.5	1.6 <sup>a</sup>	4.8 <sup>a</sup>	1.3 <sup>a</sup>	2.2 <sup>b</sup>	4.8 <sup>ab</sup>	2.4	2.7
Child no adult households	0.2	0.1	0.2	0.0 <sup>a</sup>	0.0 <sup>b</sup>	0.7 <sup>ab</sup>	0.2	0.1

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

<sup>d</sup> “Gendered household type” intentionally avoids the designation of “head of household,” which presumes certain characteristics that may or may not be present in household gender dynamics and often reflects the bias of the researcher or respondent (see Volume 6 of the Feed the Future Monitoring and Evaluation Guidance Series).

According to Table 3-2, there is a noticeable lack of education within the PRIME IE area, especially among females, 92 percent of whom have no formal education. Education is slightly more common among non-pastoralist households, particularly for males, than for the other pastoralist status groups. Input from FGDs supports the general lack of formal education reported by all groups in Borena and Jijiga. In Jijiga, FG members reported there were no schools in their communities and that children would need to travel too far to go to school in a different community. In Borena, FGD participants indicated that schools are in generally poor condition due to limited government investment, and that teachers are poorly qualified. They also noted that children often have to travel long distances (as far as 30 km in one community) to attend school.

Participants in one FG in Borena specifically mentioned the lack of a school feeding program and noted that other communities have such programs. FGD participants also noted high drop-out rates, especially among girls. In particular, it was reported that when families migrated in search of water or better pasture, children were forced to drop out of school. Multiple communities in Borena claim to have organized collective action to construct and maintain community primary schools,

**Table 3-2. Education and Occupation Status of Adult Household Members**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
<b>Education (%)</b>								
Females: No formal education	92.1	90.5 <sup>a</sup>	96.1 <sup>a</sup>	92.9	92.5	90.1	92.4	91.5
Females: Primary	6.5	7.7 <sup>a</sup>	3.5 <sup>a</sup>	5.3	6.5	8.4	6.3	6.8
Females: Secondary or higher	1.4	1.8 <sup>a</sup>	0.4 <sup>a</sup>	1.8	1.0	1.5	1.3	1.7
Males: No formal education	75.0	72.4 <sup>a</sup>	81.3 <sup>a</sup>	79.2 <sup>a</sup>	74.5 <sup>a</sup>	68.9 <sup>a</sup>	75.6	73.8
Males: Primary	18.4	19.3	16.3	14.1 <sup>ab</sup>	19.9 <sup>a</sup>	22.7 <sup>b</sup>	17.7	20.1
Males: Secondary or higher	6.5	8.3 <sup>a</sup>	2.4 <sup>a</sup>	6.7	5.6 <sup>a</sup>	8.4 <sup>a</sup>	6.7	6.1
<b>Main occupation (%)<sup>c</sup></b>								
Females: Farming own land	10.9	10.4	12.2	3.3 <sup>ab</sup>	14.4 <sup>a</sup>	16.2 <sup>b</sup>	11.3	10.1
Females: Livestock rearing	9.4	10.1	8.0	16.9 <sup>a</sup>	6.3 <sup>a</sup>	3.5 <sup>1a</sup>	8.1 <sup>a</sup>	12.3 <sup>a</sup>
Females: Unpaid domestic work	69.2	69.9	67.6	72.8 <sup>a</sup>	69.9 <sup>b</sup>	61.6 <sup>ab</sup>	70.4	66.6
Females: Salaried or other paid work	5.1	4.3 <sup>a</sup>	6.8 <sup>a</sup>	2.2 <sup>a</sup>	4.1 <sup>a</sup>	12.0 <sup>a</sup>	5.1	5.0
Females: Other	5.4	5.5	5.4	4.8	5.3	6.7	5.1	6.1
Males: Farming own land	51.7	42.3 <sup>a</sup>	73.4 <sup>a</sup>	21.5 <sup>a</sup>	70.8 <sup>a</sup>	60.8 <sup>a</sup>	52.8	49.3
Males: Livestock rearing	29.7	38.9 <sup>a</sup>	8.6 <sup>a</sup>	63.4 <sup>a</sup>	14.2 <sup>a</sup>	6.4 <sup>a</sup>	28.9	31.3
Males: Unpaid domestic work	0.4	0.3 <sup>a</sup>	0.9 <sup>a</sup>	0.2	0.5	0.7	0.5	0.3
Males: Salaried or other paid work	6.6	5.9	8.3	2.3 <sup>a</sup>	3.7 <sup>b</sup>	20.4 <sup>ab</sup>	6.2	7.5
Males: Other	11.6	12.8 <sup>a</sup>	8.8 <sup>a</sup>	12.6	10.7	11.7	11.5	11.6

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

<sup>c</sup> Occupational status is given for working-age adults (18-60).

indicating they felt forced to do so in light of the lack of government support for school construction. One community reported contributing money to construct school buildings and to initiate a school feeding program by providing food and hiring a cook. They also constructed a dormitory/boarding house for female students from remote areas, helping to address the drop-out rate due to the distances they are often required to travel.

*“The lack of access to education in the community (due to lack of school facilities) means that no one is educated from the community to bring about new ideas and help for change.”*

–Male FGD participant  
Jijiga

Female FGD respondents in Jijiga (Halahago *kebele*) claim that the community was previously generally uneducated and did not appreciate the benefits of education. Even when encouraged to do so, parents were reticent to send their children to school, believing that an educated child would not want to stay and work on the farm. Now, in addition to supporting education for their children, women seek educational opportunities for themselves because it makes them feel better prepared and more able to help address problems in their communities and in society generally.

Table 3-2 also reports on the main occupations of adult household members. Men are most likely to report their main occupation as farming or livestock rearing. Women are most likely to report their main occupation as unpaid domestic work but, notably, more than 20 percent have farming and livestock rearing as their main occupation. There are substantial differences in reported occupations for men in Borena and Jijiga; these are consistent with the results on pastoral status presented in Figure 3-1. Nearly five times as many men in Borena than Jijiga report rearing livestock, and nearly three-fourths of men in Jijiga report farming their own land while only 42.3 percent do in Borena. Thus, men in Borena split their time somewhat equally between crop and livestock production, while farming is more common among men in Jijiga. Farming is the dominant occupation for males in non-pastoralist households, though they also rely more on salaried or other paid labor than pastoralist or agro-pastoralist households.

Table 3-3 shows that the majority of those surveyed live in thatched huts without toilets, although circumstances differ between locations. Housing type appears to be more diverse in Jijiga than in Borena, where the vast majority of households report living in thatched huts. This could be due, in part, to the larger proportion of non-pastoralist households in Jijiga. Diversity in housing is highest among non-pastoralists compared to the other pastoralist status groups. However, more households in Borena report having some sort of toilet facility (e.g., pit or flush toilets), corresponding to households there being more likely to live in a permanent structure.

Limited access to drinking water places significant demands on the time and labor of women and children (who are usually responsible for fetching water) and, in extreme cases, forces households to migrate. In Borena, female FG participants claimed that water from a central pump has become too “hard” (i.e., mineralized) and is not fit for human consumption. It is now only used for livestock.

Participants across several FGs reported that their communities were serviced by only one water pump. According to one group, one water pump serves 28 *gares* (20 to 30 households) in the *kebele*. Many households live far away from the pump, making it very difficult to access, according to FG participants. Pump maintenance costs are reportedly very high (100,000 Ethiopian birr, or about \$5,000), and most communities reported difficulties getting timely repairs. When the pump is not working, households may have to search for water for up to 9 hours. The majority of FGs in Borena, in particular, mentioned lack of access to water as a driver of conflict among *kebeles*.

*“Shortage of water is a big problem in that they [women] typically travel around three hours by foot to get to hand-pump water.”*

–Female FGD participant in Jijiga

**Table 3-3. Household Dwelling Characteristics**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
<b>Type of house (%) and number of rooms</b>								
House (brick, cement, or adobe)	9.1	6.2 <sup>a</sup>	16.4 <sup>a</sup>	4.0 <sup>ab</sup>	10.8 <sup>a</sup>	13.8 <sup>b</sup>	9.5	8.3
Thatched hut	78.2	90.1 <sup>a</sup>	48.3 <sup>a</sup>	88.8 <sup>a</sup>	76.8 <sup>a</sup>	65.0 <sup>a</sup>	80.4 <sup>a</sup>	73.0 <sup>a</sup>
Tent	10.2	1.6 <sup>a</sup>	31.6 <sup>a</sup>	6.1 <sup>a</sup>	9.9 <sup>a</sup>	16.7 <sup>a</sup>	7.3 <sup>a</sup>	16.8 <sup>a</sup>
Other	2.5	2.0	3.7	1.2 <sup>a</sup>	2.6	4.5 <sup>a</sup>	2.8	1.9
Mean number of rooms	1.9	2.1 <sup>a</sup>	1.5 <sup>a</sup>	2.2 <sup>a</sup>	1.9 <sup>a</sup>	1.7 <sup>a</sup>	1.9	2.0
<b>Type of latrine (%)</b>								
No toilet	72.4	62.9 <sup>a</sup>	96.1 <sup>a</sup>	70.4 <sup>a</sup>	71.0	77.7 <sup>a</sup>	70.9	75.7
Flush toilet	3.0	3.6 <sup>a</sup>	1.5 <sup>a</sup>	3.1	3.8 <sup>a</sup>	1.4 <sup>a</sup>	3.2	2.6
Pit toilet	24.6	33.5 <sup>a</sup>	2.4 <sup>a</sup>	26.4	25.2	21.0	25.9	21.7
<b>Water source (%) and time to fetch water</b>								
Pond	41.7	44.6 <sup>a</sup>	34.6 <sup>a</sup>	54.9 <sup>ab</sup>	35.6 <sup>a</sup>	33.1 <sup>b</sup>	41.0	43.4
Hand-dug well	19.1	22.7 <sup>a</sup>	9.9 <sup>a</sup>	17.4	20.2	19.5	19.6	17.8
Tube well	3.0	3.1	2.6	1.9	3.5	3.7	3.7 <sup>a</sup>	1.3 <sup>a</sup>
Deep-tube well	4.4	4.7	3.7	4.4	4.5	4.4	4.1	5.2
Borehole	12.7	14.7 <sup>a</sup>	7.5 <sup>a</sup>	10.8	13.5	13.9	13.1	11.5
<i>Berkad</i> (artificial reservoirs)	9.7	0.5 <sup>a</sup>	32.5 <sup>a</sup>	6.3 <sup>ab</sup>	11.9 <sup>a</sup>	10.7 <sup>b</sup>	6.8 <sup>a</sup>	16.1 <sup>a</sup>
River	3.8	4.0	3.1	2.0 <sup>ab</sup>	4.1 <sup>a</sup>	5.8 <sup>b</sup>	4.7	1.8
Trucked to settlements with permanent water source	1.4	0.8 <sup>a</sup>	3.0 <sup>a</sup>	0.8	1.4	2.3	1.3	1.7
Other	4.3	4.9	3.0	1.5 <sup>ab</sup>	5.4 <sup>a</sup>	6.6 <sup>b</sup>	5.7 <sup>a</sup>	1.3 <sup>a</sup>
Average time to fetch water (hrs.)	1.5	1.8 <sup>a</sup>	0.9 <sup>a</sup>	1.8 <sup>a</sup>	1.5 <sup>a</sup>	1.2 <sup>a</sup>	1.6	1.4

<sup>ab</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

## 3.2 Livelihood Activities

Table 3-4 reports on the livelihood activities households engage in and the main sources of income and food. Note that these data complement the main occupation findings discussed in the last section by providing more specific household livelihoods information.

**Table 3-4. Livelihood Activities**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
<b>Percent of households engaging in various livelihood activities</b>								
Farming/crop production and sales	84.8	83.7	87.3	76.9 <sup>a</sup>	100.0 <sup>ab</sup>	69.7 <sup>b</sup>	86.4	81.1
Livestock production and sales	80.8	87.0 <sup>a</sup>	65.2 <sup>a</sup>	100.0 <sup>a</sup>	99.3 <sup>a</sup>	20.4 <sup>a</sup>	81.0	80.2
Wage labor	17.9	21.8 <sup>a</sup>	7.9 <sup>a</sup>	12.8 <sup>a</sup>	18.3 <sup>a</sup>	24.5 <sup>a</sup>	20.7 <sup>a</sup>	11.3 <sup>a</sup>
Salaried work	1.7	1.9	1.1	0.4 <sup>a</sup>	0.7 <sup>b</sup>	5.3 <sup>ab</sup>	1.8	1.5
Sale of wild/brush products	1.5	1.4	1.6	0.6 <sup>a</sup>	1.3 <sup>b</sup>	3.1 <sup>ab</sup>	1.6	1.1
Self-employment	5.4	6.1	3.5	2.6 <sup>a</sup>	3.5 <sup>b</sup>	12.7 <sup>ab</sup>	5.7	4.5
Sale of other non-livestock assets	0.2	0.2	0.3	0.2	0.1	0.4	0.2	0.3
Remittances	4.0	5.3 <sup>a</sup>	0.7 <sup>a</sup>	3.9 <sup>a</sup>	1.5 <sup>a</sup>	8.4 <sup>a</sup>	3.9	4.2
Gifts/inheritance	6.7	7.5 <sup>a</sup>	4.7 <sup>a</sup>	4.3 <sup>a</sup>	3.2 <sup>b</sup>	16.3 <sup>ab</sup>	6.7	6.7
<b>Main source of household income and food (%)</b>								
Farming/crop production and sales	53.5	45.8 <sup>a</sup>	72.7 <sup>a</sup>	0.0 <sup>a</sup>	100.0 <sup>a</sup>	50.6 <sup>a</sup>	54.0	52.2
Livestock production and sales	34.8	41.6 <sup>a</sup>	17.7 <sup>a</sup>	100.0 <sup>ab</sup>	0.0 <sup>a</sup>	0.0 <sup>b</sup>	33.5	37.7
Wage labor	3.2	3.5	2.3	0.0 <sup>a</sup>	0.0 <sup>b</sup>	13.3 <sup>ab</sup>	3.8 <sup>a</sup>	1.7 <sup>a</sup>
Salaried work	1.1	1.3	0.6	0.0 <sup>a</sup>	0.0 <sup>b</sup>	4.5 <sup>ab</sup>	1.0	1.2
Sale of wild/brush products	0.5	0.6 <sup>a</sup>	0.1 <sup>a</sup>	0.0 <sup>a</sup>	0.0 <sup>b</sup>	2.0 <sup>ab</sup>	0.6	0.2
Self-employment	2.5	2.5	2.3	0.0 <sup>a</sup>	0.0 <sup>b</sup>	10.3 <sup>ab</sup>	2.6	2.2
Sale of other non-livestock assets	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1
Remittances	1.3	1.7 <sup>a</sup>	0.2 <sup>a</sup>	0.0 <sup>a</sup>	0.0 <sup>b</sup>	5.5 <sup>ab</sup>	1.2	1.5
Gifts/inheritance	2.1	1.8	3.0	0.0 <sup>a</sup>	0.0 <sup>b</sup>	8.9 <sup>ab</sup>	2.0	2.3

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

Farming and livestock production are the predominant livelihood activities among households in the PRIME IE area, with more than 80 percent of households engaged in each. The vast majority of pastoralist and agro-pastoralist households engage in crop production and livestock rearing. Agro-pastoralist households more often report crop sales as their main source of income, while pastoralist households rely more on livestock sales. Crop production is the dominant livelihood activity among non-pastoralist households, which tend to have more diversified livelihoods and income sources, including working as wage laborers, salaried employees, and in self-employment, selling wild-harvested products, and relying on remittances and gifts/inheritance. While a very low percent of households rely on remittances overall, the prevalence is eight times higher in Borena than in Jijiga.

### 3.3 Migration Patterns

Migration with livestock is a major event in the PRIME IE area, typically occurring during the dry season in order to search for food and water for the animals. This recurrent migration allows

pastures to regenerate during the rainy season. Another type of migration is more permanent, such as when a household moves to an urban area in search of a better livelihood. The migration data presented in this section should be interpreted in light of the fact that the distinction between recurrent and permanent migration was not made when survey respondents were questioned.

Table 3-5 presents data on the percentage of households migrating in the last 2 years and the percentage with a member who migrated in the last year. (Both were 10.5 percent.) Migration of whole households was more common in Borena (13.3 percent) than in Jijiga (3.7 percent). This is not surprising, given that pastoralism is more prevalent in Borena. Taking animals to water/pasture is the main reason households and individuals migrate. Other commonly cited reasons are the death of a family member, marriage, and to seek education or alternative sources of income. Among individual migrants, just over 20 percent send remittances to their household of origin.

**Table 3-5. Migration Patterns and Remittances**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
<b>Percent of households migrating in the last 2 years</b>	10.5	13.3 <sup>a</sup>	3.7 <sup>a</sup>	14.6 <sup>ab</sup>	8.2 <sup>a</sup>	8.6 <sup>b</sup>	10.8	9.9
<b>Percent of households with plans to migrate</b>	4.6	4.3	5.3	5.5	4.4	3.6	4.3	5.3
<b>Reasons for planning to migrate</b> (% among planners)								
Water/grazing land/farm land	52.2	55.6	45.2	61.9 <sup>a</sup>	51.9	31.0 <sup>a</sup>	47.4	61.2
Security reasons	1.5	0.0 <sup>a</sup>	4.7 <sup>a</sup>	1.8	1.9	0.0	0.0	4.3
Marriage	2.1	3.1	0.0	0.0	2.6	5.5	3.2	0.0
Death of a family member	7.5	10.6 <sup>a</sup>	1.1 <sup>a</sup>	14.5	3.5	0.0	8.5	5.7
Government resettlement	3.4	2.5	5.2	4.0	2.6	3.6	4.2	1.9
Other	33.4	28.3	43.9	17.9 <sup>ab</sup>	37.5 <sup>a</sup>	59.8 <sup>b</sup>	36.8	27.0
<b>Percent of households with an individual member who migrated in the last two years</b>	10.5	10.8	9.7	14.3 <sup>ab</sup>	8.4 <sup>a</sup>	8.4 <sup>b</sup>	10.1	11.2
<b>Reasons for migrating</b> (% among migrants)								
Education	11.1	9.9	-	13.4	11.8	-	9.4	14.5
Alternative source of income	22.9	21.0	-	9.1	13.2	-	28.7 <sup>a</sup>	11.2 <sup>a</sup>
Marriage	7.7	4.7	-	8.2	9.6	-	7.6	7.7
Conflict	0.9	0.6	-	1.0	0.0	-	0.4	1.8
Take livestock to pasture/water	52.4	58.2	-	65.0	58.7	-	47.1	63.0
Other	5.1	5.7	-	3.3	6.9	-	6.7	1.8
<b>Percent of individual migrants who send remittances to household</b>	20.6	21.3	-	18.9 <sup>a</sup>	1.1 <sup>a</sup>	-	26.5 <sup>a</sup>	8.8 <sup>a</sup>

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

The qualitative data give a more nuanced perspective on migration. Given the heavy reliance on livestock rearing as a key livelihood activity in the PRIME IE area, it is not surprising that the main reason cited for migrating was the need for water and pasture for livestock. Thus, the overall low percentage of individuals or households reporting they had migrated over the last 2 years may reflect the fact that moving around for livestock purposes is not considered “migrating.” This could be due to how enumerators presented and explained questions about migration. During the endline survey, enumerators should be very clear about what it means for an individual or household to have migrated. It should also be noted, however, that a male FG in Borena suggested that people have mostly stopped migrating in search of water or pasture because of the drastically reduced numbers of livestock left in the community. Too many have died from drought or disease, or have been sold while they still fetched a good price.

FG members also mentioned the time and labor demands that limited access to drinking water has on women and children, who are primarily responsible for fetching water, and suggested that lack of water often forces households to migrate. They also indicated that many men migrate to find work, particularly during conflict or if they lose all of their livestock to drought. They sometimes seek local wage work (e.g., migrating to nearby Jijiga). Other times they migrate to Djibouti, Kenya, or Somaliland, or seek relatives in other locations, where they can work and send money back to the families they left behind. In Borena, labor migration is reportedly more common in communities near the Kenyan border (Melbana, Miyo), where FGD respondents characterized it as a “negative” coping strategy.

*“The only one who is left here at the time of migration is the one without any cattle and the one who is poor.”*

–Female FGD participant;  
Jijiga

It was also noted by a male FG participant in Jijiga that men’s ability to migrate may be hampered by lack of personal identification (e.g., proof of *kebele* residence) because without such identification they risk being seen as insurgents and possibly arrested by police or town administrators.

### 3.4 Livestock Ownership and Access to Land

Table 3-6 presents results on livestock ownership. Overall, households in Borena owned more of most types of livestock than households in Jijiga. This finding is consistent with the larger percentage of pastoralist households in Borena. Local cattle are the most widely owned type of livestock for households in the PRIME IE area, followed closely by goats and sheep. Very few households report owning exotic or improved livestock. Poultry ownership is far more prevalent in Borena (44 percent of households) but almost non-existent in Jijiga (4.3 percent). Not surprisingly, livestock ownership is lowest among non-pastoralist households.

Although ownership of camels is low overall, pastoralists are twice as likely to own camels as agro-pastoralists. Male FGD participants in Borena claim there is an increase in the number of camels being purchased, ascribing this change to a perception that camels can consume and digest certain bushes that are unpalatable to cattle. Additionally, camels are considered to be more tolerant to drought conditions than cattle and continue to produce milk when cattle cannot.

**Table 3-6. Livestock Ownership**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
<b>Percent of households owning various animals</b>								
<b>Cattle</b>								
Oxen	49.2	53.8 <sup>a</sup>	38.0 <sup>a</sup>	55.8 <sup>a</sup>	56.3 <sup>b</sup>	26.4 <sup>ab</sup>	51.6 <sup>a</sup>	43.7 <sup>a</sup>
Bulls	11.8	14.8 <sup>a</sup>	4.6 <sup>a</sup>	18.7 <sup>a</sup>	10.0 <sup>a</sup>	4.8 <sup>a</sup>	12.1	11.3
Young bulls	23.8	30.9 <sup>a</sup>	6.5 <sup>a</sup>	32.3 <sup>a</sup>	25.3 <sup>a</sup>	8.6 <sup>a</sup>	24.6	22.1
Exotic bulls	0.3	0.1 <sup>a</sup>	0.7 <sup>a</sup>	0.3	0.2	0.3	0.2	0.5
Local cows	82.0	85.2 <sup>a</sup>	74.0 <sup>a</sup>	94.6 <sup>a</sup>	88.3 <sup>a</sup>	51.5 <sup>a</sup>	81.9	82.0
Crossbred cows	0.4	0.2 <sup>a</sup>	0.9 <sup>a</sup>	0.3	0.5	0.4	0.2	0.7
Exotic cows	0.3	0.2 <sup>a</sup>	0.7 <sup>a</sup>	0.4	0.2	0.3	0.2 <sup>a</sup>	0.7 <sup>a</sup>
Local heifers	32.4	36.9 <sup>a</sup>	21.4 <sup>a</sup>	44.9 <sup>a</sup>	32.4 <sup>a</sup>	13.4 <sup>a</sup>	31.5	34.4
Crossbred heifers	0.1	0.1	0.2	0.0	0.1	0.3	0.2	0.0
Exotic heifers	0.2	0.1 <sup>a</sup>	0.6 <sup>a</sup>	0.2	0.3	0.1	0.2	0.3
Local calves	68.3	76.7 <sup>a</sup>	47.9 <sup>a</sup>	87.1 <sup>a</sup>	72.0 <sup>a</sup>	33.7 <sup>a</sup>	68.5	68.0
Crossbred calves	0.2	0.2	0.0	0.4	0.1	0.0	0.1	0.2
Exotic calves	0.1	0.0 <sup>a</sup>	0.2 <sup>a</sup>	0.0	0.1	0.0	0.0	0.1
<b>Poultry</b>								
Poultry	32.7	44.3 <sup>a</sup>	4.3 <sup>a</sup>	34.2 <sup>a</sup>	37.9 <sup>b</sup>	21.2 <sup>ab</sup>	36.2 <sup>a</sup>	24.8 <sup>a</sup>
<b>Sheep/Goats</b>								
Sheep	55.5	59.2 <sup>a</sup>	46.2 <sup>a</sup>	64.4 <sup>a</sup>	60.0 <sup>b</sup>	33.9 <sup>ab</sup>	57.0	52.0
Goats	72.2	78.5 <sup>a</sup>	56.9 <sup>a</sup>	82.9 <sup>a</sup>	76.1 <sup>a</sup>	49.3 <sup>a</sup>	73.2	70.2
<b>Other</b>								
Donkeys	34.7	30.9 <sup>a</sup>	44.0 <sup>a</sup>	37.9 <sup>a</sup>	38.1 <sup>b</sup>	23.8 <sup>ab</sup>	33.1	38.4
Horses	0.2	0.2	0.1	0.4 <sup>a</sup>	0.0 <sup>a</sup>	0.1	0.2	0.0
Mules	0.7	1.0 <sup>a</sup>	0.1 <sup>a</sup>	1.9 <sup>ab</sup>	0.2 <sup>a</sup>	0.00 <sup>b</sup>	0.8	0.6
Camels	16.4	16.0	17.2	26.4 <sup>a</sup>	13.1 <sup>a</sup>	7.3 <sup>a</sup>	16.2	16.9
<b>Summary by category of animal (%)</b>								
Cattle (excluding oxen)	85.5	88.3 <sup>a</sup>	78.8 <sup>a</sup>	96.0 <sup>a</sup>	92.4 <sup>a</sup>	57.4 <sup>a</sup>	85.4	85.9
Oxen	49.2	53.8 <sup>a</sup>	38.0 <sup>a</sup>	55.8 <sup>a</sup>	56.3 <sup>b</sup>	26.4 <sup>ab</sup>	51.6 <sup>a</sup>	43.7 <sup>a</sup>
Poultry	32.7	44.3 <sup>a</sup>	4.3 <sup>a</sup>	34.2 <sup>a</sup>	37.9 <sup>b</sup>	21.2 <sup>ab</sup>	36.2 <sup>a</sup>	24.8 <sup>a</sup>
Sheep/goats	79.1	84.2 <sup>a</sup>	66.4 <sup>a</sup>	88.5 <sup>a</sup>	83.5 <sup>a</sup>	56.8 <sup>a</sup>	80.2	76.4
Other	43.7	39.8 <sup>a</sup>	53.2 <sup>a</sup>	52.3 <sup>a</sup>	45.0 <sup>a</sup>	28.6 <sup>a</sup>	42.4	46.6

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

Regarding access to land in Ethiopia, the state owns all rural land, with user rights for small landholders to help engender a sense of “ownership” and, therefore, longer-term investments such as irrigation infrastructure and improved soils.<sup>23,24</sup> Agricultural land can be inherited and “owned” although it is managed by the community or clan. Customary lands are community lands that are either communally used (customary community-held) or parceled by community leaders to individuals and households for their own use (customary privately-held). These lands may not be sold. Leasehold lands are leased from someone else (e.g., customary privately held, freehold) and freehold lands are “privately held” in the sense that a certificate of use has been issued. Public lands

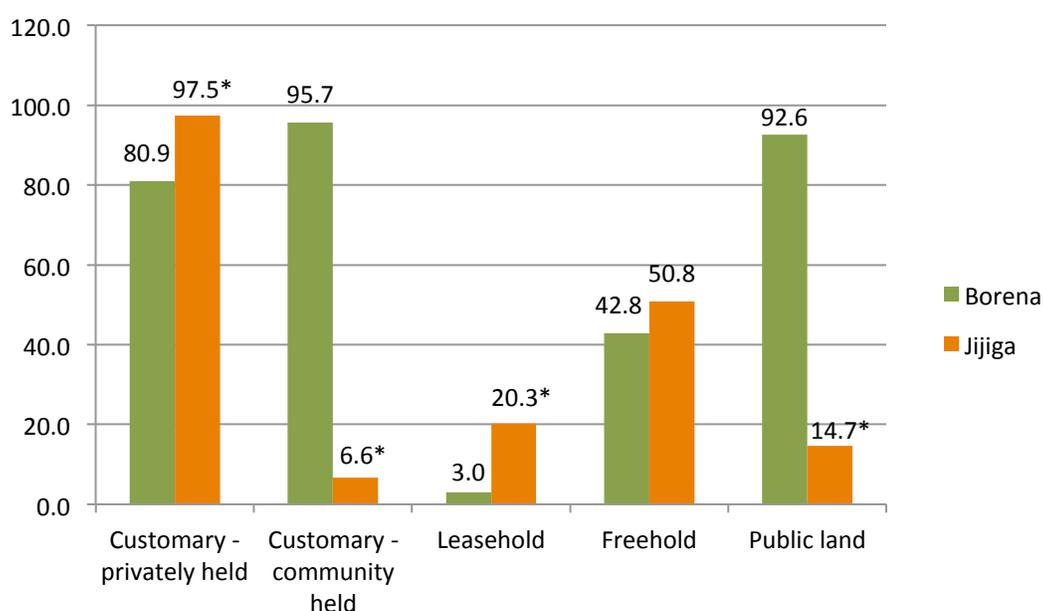
<sup>23</sup> Zewdie, Yihewew, Amdissa Teshome and Kassahun Berhanu. 2013.

<sup>24</sup> USAID. 2012b.

are owned by the state and may have been expropriated for public purposes (e.g., rural roads, water works, military operations), foreign investment, or other purposes.

Figure 3-2 reports the types of land tenure systems that exist within communities as reported by community survey participants. The most common land tenure systems are customary-privately held, customary-community held, freehold, and public land. Customary-community lands are far more common in Borena than in Jijiga (95.7 versus 6.6 percent). Likewise, public land is a far more common form of land tenure in Borena than in Jijiga. Leasing land is much more commonly practiced in Jijiga than Borena, though is not commonly practiced overall.

**Figure 3-2. Percent of Communities with Various Land Tenure Types, by Project Area**



\* Indicates significantly different at the 0.05 level.

Table 3-7 presents data from the household survey on access to land “now,” a year ago, and 2 years ago. “Access” is equivalent to “ownership” in that households use the land for their own purposes even though they have no deeds of ownership or title.<sup>25</sup> On average, households in the PRIME IE area have access to 1.5 hectares of agricultural land, which has not changed over the past 2 years. Households in Jijiga have access to twice as much land as households in Borena (2.6 and 1.1 hectares, respectively). Agro-pastoralists tend to have access to more land than pastoralists or non-pastoralists.

<sup>25</sup> A system for registering farm holdings and issuing certificates of holding exists in Ethiopia and resides with elected village representatives.

**Table 3-7. Access to Land**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
<b>Access to land (mean hectares)</b>								
Now	1.54	1.1 <sup>a</sup>	2.6 <sup>a</sup>	1.3 <sup>a</sup>	1.8 <sup>ab</sup>	1.4 <sup>b</sup>	1.5	1.7
1 year ago	1.53	1.1 <sup>a</sup>	2.5 <sup>a</sup>	1.3 <sup>a</sup>	1.8 <sup>ab</sup>	1.3 <sup>b</sup>	1.4	1.7
2 years ago	1.52	1.1 <sup>a</sup>	2.5 <sup>a</sup>	1.3 <sup>a</sup>	1.8 <sup>ab</sup>	1.3 <sup>b</sup>	1.4	1.7

<sup>ab</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

According to female FGD participants in Borena, limited access to land is a constraint to agricultural production for some households. Despite continuing dependence on livestock as the primary source of income and food, some households have begun to cultivate vegetables and grains as a result of technical assistance received from Development Agents (i.e., extension agents). However, the participants suggest they are unable to produce sufficient amounts to last through the dry season, even with good rains, because of their limited access to land. Additionally, they are reluctant to expand their production because it decreases the amount of land available for pasture.

### 3.5 Livestock Production and Marketing System

Given the predominance of livestock rearing in the IE area, this section describes the livestock production and marketing system, which helps to contextualize households' livelihood activities.

#### Challenges to Livestock Production

According to nearly all FGD participants, the main challenges to livestock production are animal disease, invasive plants, predators, and drought. Disease—particularly in cattle, goats, and camels—appears to be the primary concern of FGD participants and is perceived to be worsening over time, in part because of drought. Female FG participants in particular indicated that livestock diseases are often not easily detectable and are fast-acting, such that animals died overnight. They also recognized their limited knowledge of livestock care practices, citing use of certain practices that might actually do more harm than good to sick animals (e.g., branding cattle to cure them of a broken back or parasitic infections). FG participants in Jijiga mentioned the degradation and loss of lands from invasive plant species, particularly cactus and *berketete*, which has long roots and is thought to deplete soil moisture. FGs in Borena noted that desert scrub and bushes have proliferated as a result of warmer temperatures, reducing the availability of pasture. Others indicated their communities had initiated efforts to clear away invasive bushes, often supported by government and NGO bush-clearing projects. At least one female FG participant in Borena reported having received payment for clearing bush as a part of Action for Development and Oxfam initiatives. Male FG participants in Jijiga reported that cactus and *berketete* were taking over large tracts of farmland and pasture and that some areas had become so overrun with invasive plants that it was difficult for inhabitants to navigate (e.g., to collect firewood) and for animals to graze.

These same men believe that at least some of the invasive species are poisonous to livestock (and the meat poisonous to humans), causing abdominal bloating and death.

Drought was widely considered to be a major challenge in both Borena and Jijiga, with perceived widespread negative effects. In fact, limited access to natural resources (e.g., water and pasture) is considered the primary driver of conflict and migration in both regions. Participants indicated that livestock production is made more difficult by drought: Herders must travel farther distances for water/pasture; conflicts arise as households and communities compete for limited resources; and livestock sales or death leave households with fewer sources of food and income, making their ability to recover more difficult. Participants in several FGs noted that drought forces men to migrate with livestock, placing additional stress on families and increasing the burden on women. Even when rainfall is plentiful, FGs noted that declining soil fertility often results in weeds taking over otherwise productive land and makes regeneration of pastures more difficult.

*“The only people who are not affected when there is a shortage of rainfall are the pure pastoralists, because they have the capability to sell their animals in order to buy food.”*

–FGD participant in  
Jijiga

FGD participants in Borena and Jijiga mentioned hyenas as a specific threat to livestock but did not elaborate. The spread of invasive plants and shrubs (e.g., *Prosopis* spp.) often facilitates predation of livestock by affording good cover to predators, such as hyenas. Brush clearing is a major activity in both areas and is supported through the efforts of NGOs as well as the government’s PSNP.

### **Livestock Marketing**

Table 3-8 presents data from the household survey on the extent to which households participate in livestock markets, or the buying and/or selling of livestock. Data are presented on the average number of animals owned 1 year ago, animals purchased and sold in the last year, the number of animals dying an unplanned death, and the number of animals owned now (at the time of the survey). The unit of measure employed is tropical livestock units (TLUs), calculated as a weighted average of the number of five types of animals owned, where the weights for each animal are based on their typical size relative to a camel. The weights are as follows: camel = 1, cow = 0.7, sheep/goats = 0.1, donkeys, mules and horses = 0.67, and poultry = 0.01.<sup>26</sup>

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<sup>26</sup> Jahnke, H. E., Tacher, G., Keil, P. and Rojat, D. 1988.

**Table 3-8. Livestock Market Participation: Stocks, Purchases and Sales in the Last Year (Mean TLUs)**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
Animals owned 1 year ago	7.2	8.1 <sup>a</sup>	4.4 <sup>a</sup>	10.9 <sup>a</sup>	5.6 <sup>a</sup>	3.3 <sup>a</sup>	6.9	7.8
Animals purchased in the last year	0.16	0.13 <sup>a</sup>	0.22 <sup>a</sup>	0.19 <sup>a</sup>	0.14 <sup>a</sup>	0.12 <sup>a</sup>	0.14	0.20
Animals sold in the last year	0.71	0.81 <sup>a</sup>	0.45 <sup>a</sup>	1.17 <sup>a</sup>	0.52 <sup>a</sup>	0.25 <sup>a</sup>	0.67	0.82
Animals dying an unplanned death in last year	0.91	0.98 <sup>a</sup>	0.72 <sup>a</sup>	1.20 <sup>a</sup>	0.86 <sup>a</sup>	0.47 <sup>a</sup>	0.84	1.10
Animals owned now	7.0	7.8 <sup>a</sup>	4.7 <sup>a</sup>	10.6 <sup>a</sup>	5.6 <sup>a</sup>	3.2 <sup>a</sup>	6.8	7.5
<b>Market participation indicators</b>								
Percent of households buying or selling any animal in the last year	61.9	67.3 <sup>a</sup>	47.4 <sup>a</sup>	75.0 <sup>a</sup>	58.7 <sup>a</sup>	43.6 <sup>a</sup>	61.0	64.0
Market participation index <sup>d</sup>	6.43	6.53	6.16	6.67	6.11	6.73	6.28	6.79

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

<sup>d</sup> Average of the percentage of animals owned a year ago that were sold and the percentage of animals currently owned that were purchased.

At the time of the survey, households in Borena owned nearly twice as many animals as households in Jijiga (8.1 and 4.7 TLU, respectively). Pastoralist households owned the most animals of any group—twice as many as agro-pastoralist households and three times as many as non-pastoralist households.

To measure market participation, two indicators are employed. The first is the percentage of households buying or selling any animal in the last year. A little more than 60 percent of households in the PRIME IE area did so. This means that nearly 40 percent of households did not participate in livestock markets at all. The percentage participating is substantially higher in Borena than Jijiga and, as would be expected, higher among pastoralists than agro- and non-pastoralists.

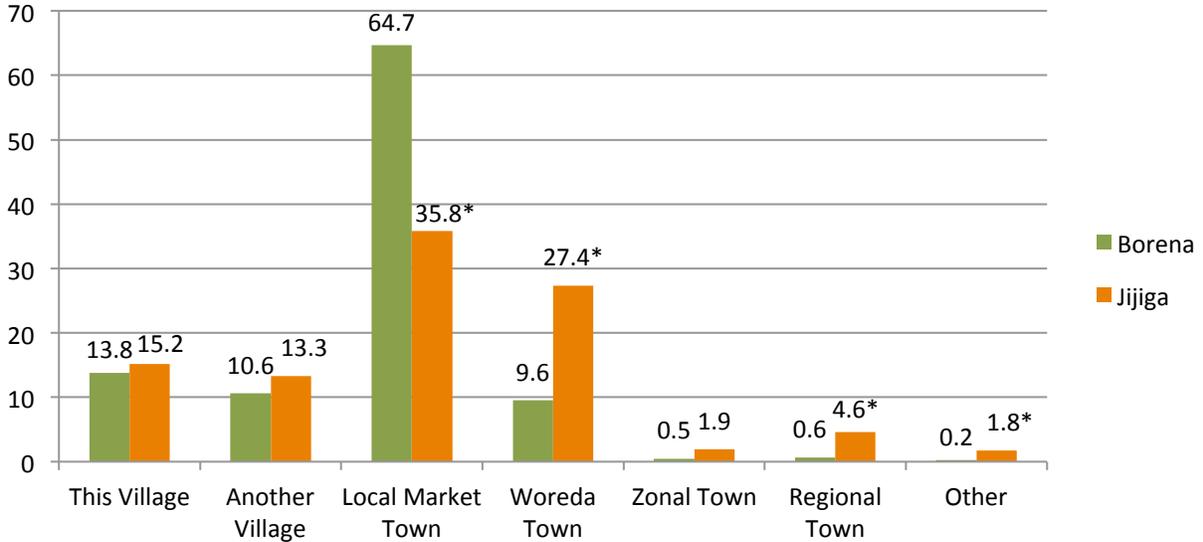
The second indicator, a “market participation index,” is not dependent on the number of animals owned and is therefore comparable across households. For each household, the index is calculated as the average of the percent of animals owned a year ago that were sold and the percent of animals owned at the time of the survey that were purchased. When accounting for the fact that Borena households own more animals than Jijiga households, and pastoralists own more than agro-pastoralists, there is no statistically significant difference in the participation of households by region or pastoralist status.<sup>27</sup>

Figure 3-3 shows that local market towns are the primary place where people purchase animals, though differences exist between locations. Livestock owners in Borena are much more likely to purchase animals at the local market town than are livestock owners in Jijiga. Despite this, the highest percentage of purchases in Jijiga were in a local market town. Another important location for

<sup>27</sup> Note that the few households that did not own any animals a year ago (7.2% of the sample) or did not own any at the time of the survey (5.9%) are included in these estimates. They receive a “zero” for the relevant percentage included in the index, in which case their index value does depend on the number of animals owned.

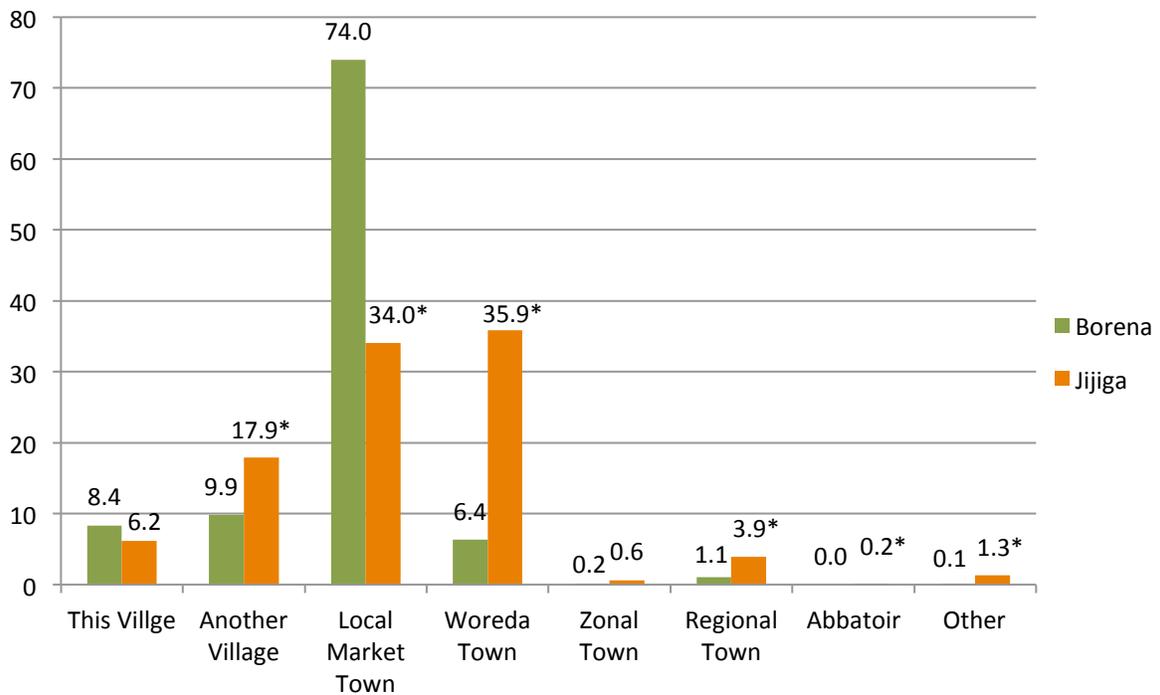
purchases in Jijiga are *woreda* towns. Patterns in the location of livestock sales mirror those of livestock purchases (see Figure 3-4).

**Figure 3-3. Primary Places of Livestock Purchases, by Project Area**



\* Indicates significantly different at the 0.05 level.

**Figure 3-4. Primary Places of Livestock Sales, by Project Area**



\* Indicates significantly different at the 0.05 level.

The qualitative findings give further insight into the issue of livestock marketing. Stocking and sales of livestock is connected to climate as well as to the likelihood of needing to migrate in search of pasture and/or water. According to some FG participants in Borena, households with plenty of livestock may sell some animals to support family members who stay in the village during migration (e.g., women, children, and the elderly). In contrast, households with only a few livestock may not sell any despite the likelihood of drought killing the few animals that they have. FG participants in Borena indicated that livestock was a valuable asset that they could not afford to lose. They also indicated that livestock were widely perceived as a status symbol. Poor households are often quite reluctant to sell their livestock, even during periods of severe or prolonged drought, so much so that some NGOs (e.g., Action Contre La Faim) have resorted to purchasing, slaughtering, and disposing of large numbers of livestock unfit for consumption (e.g., livestock that is too emaciated).

According to FGD participants, market access is a problem:

They indicated that repeated requests for external help (e.g., from the government or NGOs) had been made, with no actions or even responses provided. The distance many pastoralists and agro-pastoralists are required to travel to market is a major challenge. For example, male FG participants in several *kebeles* in Borena indicated that the nearest market was in the *woreda* town, Teletele. For some,

*“So, I feel happy if I do not respond to your questions about market as far as we are not getting immediate solutions. We have been explaining to several organizations about our challenges related to [the] market, but no one has addressed it so far.”*

–Male FGD participant in  
Borena

that meant a trip of 100km, for others only 29 km, while others required up to four days of travel on foot to access this market. Depending on the availability of food and water along the way, animals may lose weight on long marches to markets, reducing their sales value.

Although distance from markets is a major concern, FGD participants in both Borena and Jijiga indicated that their inability to directly communicate with traders, which effectively forces them to deal with brokers, was the “biggest challenge related to marketing livestock.” Respondents indicated they had no “direct” contact with traders or brokers, primarily due to lack of communications and road infrastructure. As a result, they have no access to market information such as prices, and are unaware of when a broker intends to be in an area. Brokers decide when and where to purchase animals, and can actively block larger-scale traders from coming into what they perceive as their territory to make deals, effectively protecting their monopoly. KIIs suggested that holding pens and livestock market centers would allow the government to restrict participation to licensed brokers, and provide tax revenue from livestock sales that could be used to support the livestock industry, such as with adequate holding pens.

FGD participants indicated that even though individuals can make their own assessments based on information they may get from traders or their visits to markets prior to selling, they remain at a disadvantage by not being able to communicate directly with brokers. The result is that they often end up selling livestock below fair market prices. In Jijiga, a female FG participant explained that brokers unilaterally set the terms of exchange. Lacking access to alternative information, many feel pressured to sell, even at low prices.

Male FG participants in the Tikdem *kebele* in Jijiga indicated they could now use mobile phones to check cattle and grain market prices via brokers. Although there is little to no government or NGO support for increasing mobile phone access here, male respondents perceive that access to/use of mobile phones is increasing and will be of great help in accessing market information.

As noted above, limited road access is also a constraining factor to market engagement for many producers. Some communities have engaged in collective action to construct (or advocate for the construction of) basic rural roads that would enable greater access to local markets. FGs and KIIs described limited or the lack of road infrastructure as a “huge problem” for livestock trade and for animal health generally (e.g., access to animal health clinics, access to veterinarians, and availability of inputs).

### Production and Marketing of Livestock Products: Meat, Milk, and Hides

The commodities produced from livestock—meat, milk, and hides—are a vital part of the livestock production and marketing system, and meat and milk are important sources of protein and micronutrients. Table 3-9 shows that households in the PRIME IE area produced an average of 3.2 kilograms of meat, 371.1 liters of milk, and 0.6 hides in the year prior to the survey. As would be expected, meat, milk, and hide production mirrors the pattern of livestock ownership: Pastoralist households produce the most, followed by agro-pastoralist households and non-pastoralist households. There is little difference between the average amounts produced and consumed for all three commodities, and purchase and sales amounts are quite small compared to production/consumption. This means that, overall, subsistence production dominates, with households consuming most of the meat, milk and hides they produce.

**Table 3-9. Production, Consumption, Sales, and Purchases of Livestock Commodities**

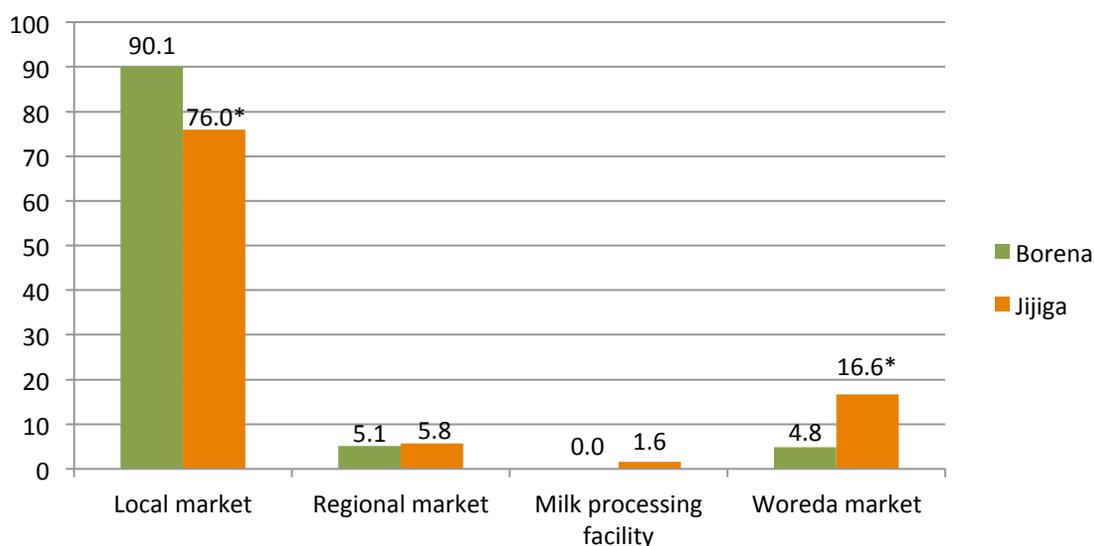
Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
<b>Amount produced in last year</b>								
Meat (kg)	3.2	3.5	2.5	5.3 <sup>ab</sup>	2.4 <sup>a</sup>	1.5 <sup>b</sup>	2.7	4.3
Milk (liters)	371.1	394.2	313.5	575.6 <sup>a</sup>	333.9 <sup>a</sup>	138.1 <sup>a</sup>	359.1	398.1
Hides (number)	0.6	0.8 <sup>a</sup>	0.2 <sup>a</sup>	1.0 <sup>a</sup>	0.5 <sup>a</sup>	0.2 <sup>a</sup>	0.7	0.5
<b>Amount purchased in last year</b>								
Meat (kg)	0.8	0.9	0.6	0.5	0.9	1.0	0.9	0.6
Milk (liters)	26.1	19.9 <sup>a</sup>	41.5 <sup>a</sup>	9.2 <sup>a</sup>	19.0 <sup>a</sup>	63.0 <sup>a</sup>	26.2	25.8
Hides (number)	0.0	0.1	0.0	0.1 <sup>a</sup>	0.0	0.0 <sup>a</sup>	0.1	0.0
<b>Amount consumed in last year</b>								
Meat (kg)	4.2	4.9 <sup>a</sup>	2.6 <sup>a</sup>	7.2 <sup>ab</sup>	2.9 <sup>a</sup>	2.2 <sup>b</sup>	3.8	5.2
Milk (liters)	349.3	392.6 <sup>a</sup>	241.3 <sup>a</sup>	531.3 <sup>a</sup>	303.4 <sup>a</sup>	164.1 <sup>a</sup>	347.8	352.5
Hides (number)	0.6	0.8 <sup>a</sup>	0.2 <sup>a</sup>	0.9 <sup>a</sup>	0.5 <sup>a</sup>	0.2 <sup>a</sup>	0.6	0.5
<b>Amount sold in last year</b>								
Meat (kg)	0.24	0.1	0.61	0.45	0.21	0.0	0.12	0.52
Milk (liters)	36.6	16.4 <sup>a</sup>	87.0 <sup>a</sup>	47.9 <sup>a</sup>	38.6 <sup>b</sup>	16.7 <sup>a,b</sup>	31.1	49.0
Hides (number)	0.05	0.06 <sup>a</sup>	0.02 <sup>a</sup>	0.07	0.04	0.04	0.05	0.05

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

The average household in Borena produces and consumes more of all three livestock commodities than the average household in Jijiga. Of note is that the average amount of milk sold and purchased is far higher in Jijiga. Milk production and sales data show that pastoralists sell a higher volume of milk than agro-pastoralists or non-pastoralists. In turn, non-pastoralists purchase more milk than the other two groups.

Following the pattern of livestock purchases and sales, Figure 3-5 shows that livestock commodity sales are primarily made in local markets in both Borena and Jijiga, although more livestock owners in Borena report selling livestock products in the local market. About three times as many livestock owners in Jijiga report selling livestock products in *woreda* town markets. KII participants indicated that the market for milk-based livestock products was seasonal and occurred primarily during the rainy season, when more milk is produced. Marketing of such products is not only limited by the ease with which the products spoil, but by the same exploitive practices of brokers and middlemen as described above.

**Figure 3-5. Primary Places of Livestock Commodity Sales, by Project Area**



\* Indicates significantly different at the 0.05 level.

### Animal Milk Consumption of Children Under 5

Children under 5 are the most vulnerable to malnutrition in the PRIME IE population and, for many, animal milk (from cows, goats, and camels) is the main source of protein and important micronutrients. Table 3-10 shows the results from survey questions about consumption of animal milk by children under 5 during the seven days prior to the survey. Overall, approximately three-fourths of children under 5 consumed animal milk in the previous week. A higher percentage of children in Jijiga (81.6 percent) consumed milk than in Borena (73.7 percent). Milk consumption by children under 5 is highest in pastoralist households than any other pastoralist status group. Milk is primarily sourced from animals owned by the household, though 16.9 percent of non-pastoralist households purchase their milk. On average, children under 5 consumed a total of 83.3 fluidounces

of milk during the seven days before the survey. The average child in Jijiga consumed nearly 30 percent more milk than the average child in Borena.

**Table 3-10. Consumption of Animal Milk by Children Under 5**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
<b>Percent of children &lt;5 consuming animal milk</b>	76.0	73.7 <sup>a</sup>	81.6 <sup>a</sup>	86.56 <sup>ab</sup>	73.4 <sup>a</sup>	66.0 <sup>b</sup>	73.8 <sup>a</sup>	80.7 <sup>a</sup>
<b>Source of milk</b>								
Own animals	92.1	94.8 <sup>a</sup>	86.5 <sup>a</sup>	97.5 <sup>a</sup>	95.0 <sup>b</sup>	75.5 <sup>ab</sup>	92.5	91.4
Relative's animals	6.8	6.2	8.3	6.3	5.5 <sup>a</sup>	10.8 <sup>a</sup>	5.9	8.7
Bought	6.3	5.9	7.2	3.7 <sup>a</sup>	3.7 <sup>b</sup>	16.9 <sup>ab</sup>	7.3	4.4
Other	0.3	0.2	0.6	0.0	0.6	0.4	0.5	0.0
<b>Amount of milk consumed among all children (mean, fl oz)</b>	83.3	74.5 <sup>a</sup>	104.1 <sup>a</sup>	96.4 <sup>a</sup>	81.7 <sup>a</sup>	67.5 <sup>a</sup>	80.1	90.2

<sup>ab</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

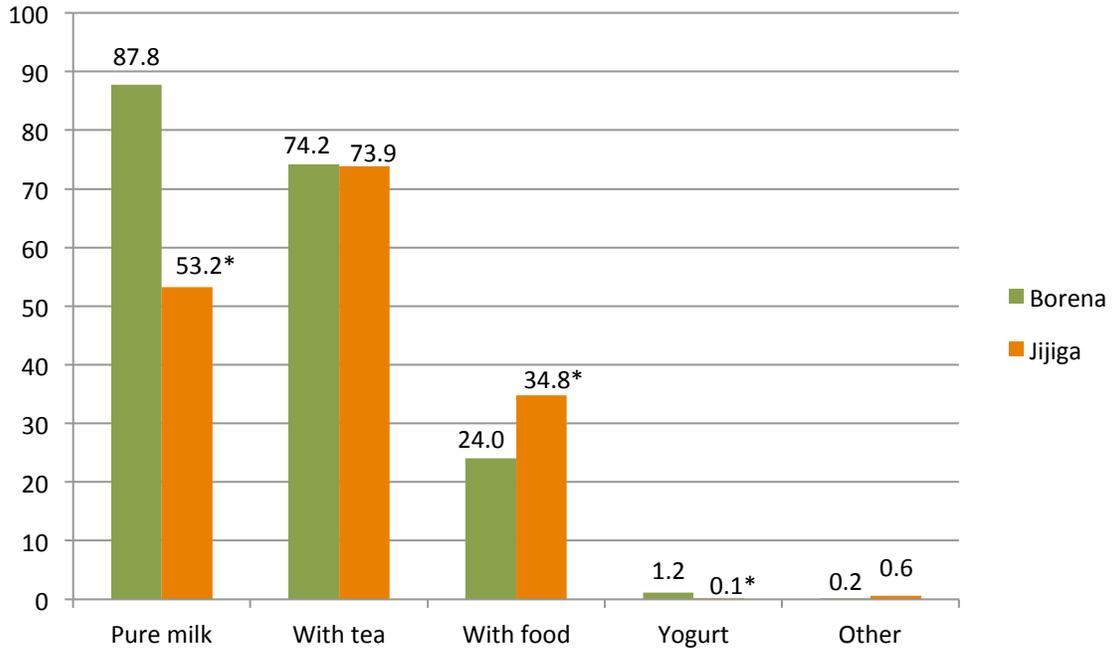
Figure 3-6 shows that the specific manner in which milk is consumed by children under 5 differs by project area. Children in Borena tend to drink more pure milk (includes cow, goat, and camel milk) than children in Jijiga, where only about one-half of those under 5 are served pure milk. Nearly three-fourths of children in both locations are served milk with tea, which is the predominant way milk is served to children in Jijiga.

Figure 3-7 shows that cow milk is the predominant type of milk served to children under 5 in the PRIME IE area. Of note, milk from camels is not widely consumed but is nearly five times more likely to be served in Borena than in Jijiga, even though household ownership of camels is similar across locations (see Table 3-6).

### **Livestock Fodder Availability**

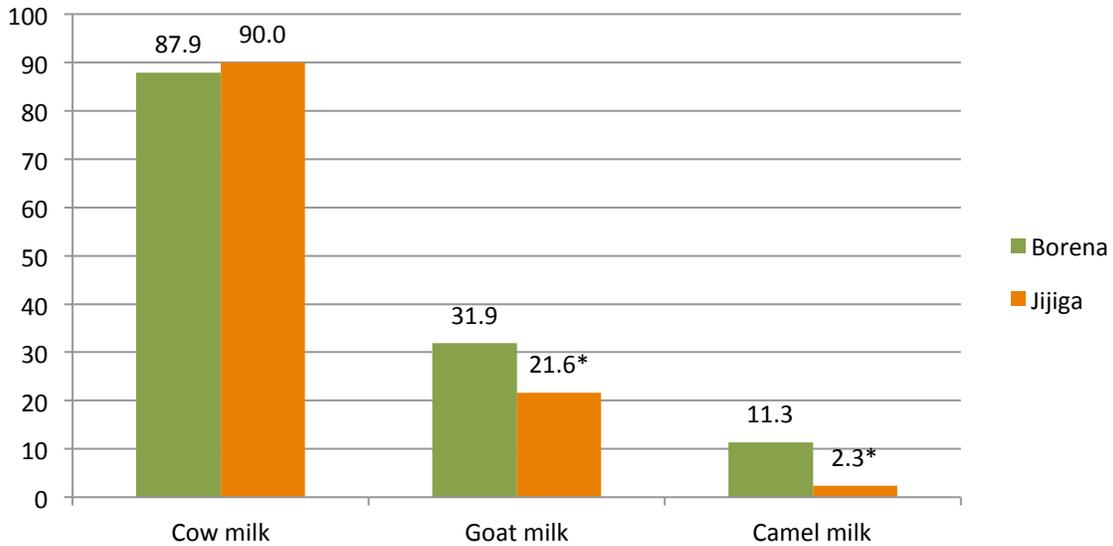
As shown in Table 3-11 (p. 39), reliance on communal lands for fodder is nearly three-and-a-half times more common in Borena than in Jijiga. In contrast, households in Jijiga rely much more on fodder from their own pastures than on communal pastures. Likewise, communal pastureland is the main source of fodder among pastoralists, where less than 10 percent of households own the land on which fodder for their animals is produced. On average, it takes an additional hour for households in Borena to find pasture than for households in Jijiga. This may be due, in part, to the tendency for communal lands to be farther from the community center than privately-held lands.

**Figure 3-6. Means by Which Children Under 5 are Served Animal Milk, by Project Area**



\* Indicates significantly different at the 0.05 level.

**Figure 3-7. Source of Animal Milk for Children Under 5, by Project Area**



\* Indicates significantly different at the 0.05 level.

**Table 3-11. Fodder Types and Availability**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
<b>Percent of livestock owners using type of fodder</b>								
Communal pasture browse	71.4	89.8 <sup>a</sup>	26.0 <sup>a</sup>	88.8 <sup>a</sup>	64.2 <sup>a</sup>	55.0 <sup>a</sup>	75.1 <sup>a</sup>	63.2 <sup>a</sup>
Private pasture browse	22.1	7.4 <sup>a</sup>	58.4 <sup>a</sup>	8.7 <sup>ab</sup>	28.4 <sup>a</sup>	33.1 <sup>b</sup>	18.8 <sup>a</sup>	29.4 <sup>a</sup>
Green fodder	1.3	0.4 <sup>a</sup>	3.6 <sup>a</sup>	0.4 <sup>a</sup>	1.1 <sup>a</sup>	3.5 <sup>a</sup>	1.2	1.6
Crop residue	4.2	2.2 <sup>a</sup>	9.1 <sup>a</sup>	1.4 <sup>ab</sup>	5.6 <sup>a</sup>	6.2 <sup>b</sup>	4.1	4.2
Improved feed	0.0	0.0	9.1	0.0	0.0	0.2	0.0	0.1
Hay	1.0	0.3 <sup>a</sup>	2.7 <sup>a</sup>	0.7	0.8 <sup>a</sup>	2.0 <sup>a</sup>	0.8	1.4
<b>Mean length of time to get to fodder/pasture (hrs.)</b>								
	1.8	2.1 <sup>a</sup>	1.1 <sup>a</sup>	2.1 <sup>ab</sup>	1.7 <sup>a</sup>	1.5 <sup>b</sup>	1.9	1.7
<b>Percent of livestock owners getting fodder at various places</b>								
Market	1.4	0.1 <sup>a</sup>	4.7 <sup>a</sup>	1.1 <sup>a</sup>	0.7 <sup>b</sup>	3.5 <sup>ab</sup>	1.4	1.5
Own field	28.3	9.9 <sup>a</sup>	73.9 <sup>a</sup>	11.4 <sup>ab</sup>	37.2 <sup>a</sup>	39.6 <sup>b</sup>	24.3 <sup>a</sup>	37.3 <sup>a</sup>
Neighbors	1.3	0.4 <sup>a</sup>	3.3 <sup>a</sup>	0.3 <sup>a</sup>	0.9 <sup>a</sup>	3.9 <sup>a</sup>	1.1	1.6
Livestock feed service	0.8	0.1 <sup>a</sup>	2.7 <sup>a</sup>	0.2 <sup>a</sup>	0.7 <sup>b</sup>	2.2 <sup>ab</sup>	0.6	1.3
Community field	67.6	88.9 <sup>a</sup>	14.6 <sup>a</sup>	86.7 <sup>a</sup>	60.3 <sup>a</sup>	48.9 <sup>a</sup>	72.1 <sup>a</sup>	57.6 <sup>a</sup>
Other	0.6	0.5	0.8	0.3 <sup>a</sup>	0.3 <sup>b</sup>	1.9 <sup>ab</sup>	0.6	0.7

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

There are dramatic differences between Borena and Jijiga in where fodder is obtained (in contrast to where it was produced), based in large part on differences in reliance on privately owned or communal pastures. Almost 89 percent of households with livestock in Borena source their fodder from community fields, while only 14.6 percent do so in Jijiga. In contrast, households in Jijiga tend to rely more on fodder produced from their own fields than in Borena. More pastoralist households get fodder from a community field than any other source or group.

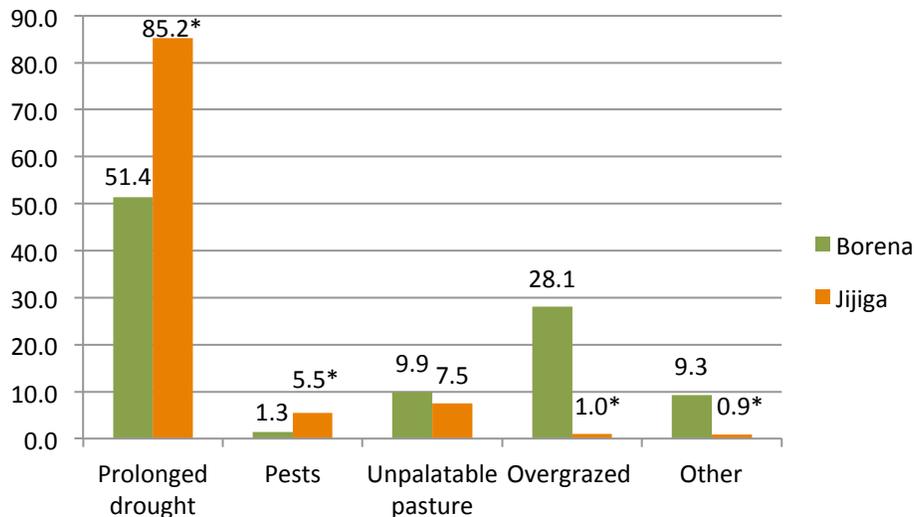
In Borena, male FG participants in several communities explained that in times of drought, they reserved communal pasture for old/sick cattle and for young cattle that could not travel long distances. The pastures are divided into two: one for the dry season and one for the rainy season. It is also somewhat common for pastoralists in Borena to both individually and communally purchase hay and crop residue and store it for use during drought. Hay and wheat bran (*frushka*) may be purchased for animals that are not healthy enough to migrate long distances in search of pasture.

Returning to the results from the household survey data, 40 percent of respondents reported that livestock fodder was less available this year than last year<sup>28</sup> (see Figure 3-8). The majority of livestock

<sup>28</sup> The percent reporting more availability than last year was 33, and the percent reporting the same as last year was 26. These data on fodder being more/same/less available do not appear in a table in this report.

owners in Borena and Jijiga cited prolonged drought as the primary reason. However, respondents in Borena also perceived over-grazing as an important reason, whereas respondents in Jijiga did not indicate it as a major factor. This may be partly explained by the difference in reliance on communal (Borena) versus self-owned (Jijiga) pastures (see Table 3-11), where management practices may differ. It is also likely that respondents in Borena are more aware of, and potentially affected by, over-grazing if they have limited alternative pasture or fodder sources.

**Figure 3-8. Reasons Given for Why Fodder/Pasture Is Less Available This Year than Last, by Project Area**



\* Indicates significantly different at the 0.05 level.

Although availability of pasture/fodder was not directly addressed in FGDs, participants did express considerable concern about the loss of soil fertility in farm and pastureland. Most FG participants also mentioned invasive plants (e.g., cactus, *berketete*) as having direct negative effects on grazing.

### Livestock Water Availability

As was the case for potable water, approximately one-half of livestock owners reported relying on ponds as their main source of water for livestock. The next most common sources of water were hand-dug wells and boreholes (see Table 3-12). This pattern holds for Borena and all pastoralist status groups. In Jijiga, ponds are the most common source, followed by boreholes and hand-dug wells.

**Table 3-12. Livestock Water Availability**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
<b>Percent of livestock owners getting water for their livestock from various sources</b>								
River	5.2	5.3	4.9	2.6 <sup>ab</sup>	6.1 <sup>a</sup>	8.0 <sup>b</sup>	5.9	3.7
Stream	2.0	1.2 <sup>a</sup>	4.0 <sup>a</sup>	0.4 <sup>ab</sup>	2.9 <sup>a</sup>	2.9 <sup>b</sup>	2.2	1.4
Spring	3.1	4.0 <sup>a</sup>	0.9 <sup>a</sup>	1.3 <sup>ab</sup>	4.1 <sup>a</sup>	4.4 <sup>b</sup>	3.3	2.8
Pond	49.3	50.0	47.4	57.8 <sup>ab</sup>	44.8 <sup>a</sup>	43.6 <sup>b</sup>	48.7	50.5
Borehole well	14.1	11.9 <sup>a</sup>	19.4 <sup>a</sup>	11.3	16.0	14.9	14.9	12.2
Hand dug well	20.4	24.2 <sup>a</sup>	11.0 <sup>a</sup>	22.1	20.5	17.2	19.9	21.5
Delivered by water truck	1.9	0.4 <sup>a</sup>	5.7 <sup>a</sup>	0.9	2.2	2.9	1.2 <sup>a</sup>	3.5 <sup>a</sup>
Other	4.0	2.9 <sup>a</sup>	6.8 <sup>a</sup>	3.6 <sup>a</sup>	3.4 <sup>b</sup>	6.1 <sup>ab</sup>	3.9	4.3

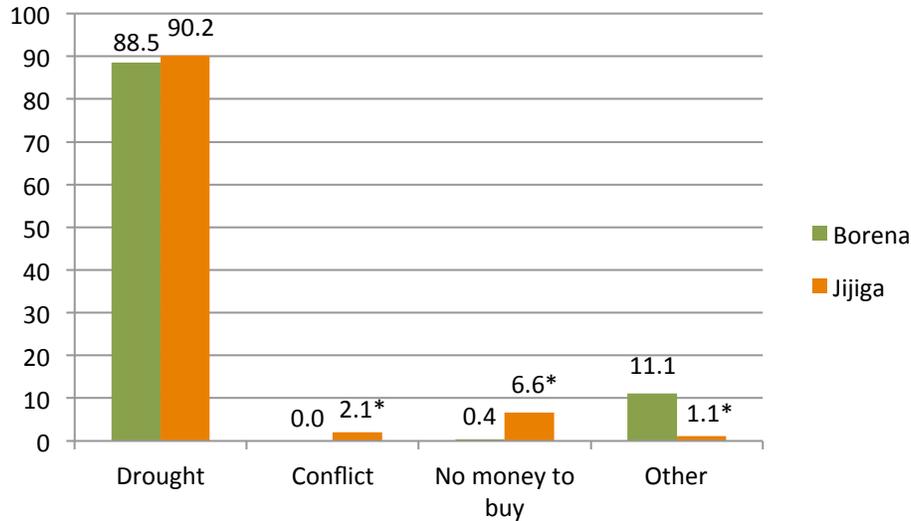
<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

With ponds and hand-dug wells reported as the primary sources of water for livestock and humans (see Table 3-3), it is clear that contamination presents a significant health challenge and that drought affects the availability of water for humans and animals alike. As previously noted, most FGD participants indicated that water shortages have increased over time and are having a negative impact on water for herds as well as potable water sources. In particular, greater distances are required to search for water during drought.

The household survey data indicate that 27 percent of livestock owners believe water is less available this year than last year. Figure 3-9 provides results about why they believe this. Most livestock owners in both Borena and Jijiga reported that less water was available this year because of prolonged drought. In Jijiga, where more households rely on water delivered by truck, more livestock owners reported a lack of money for purchasing water as the reason that less was available this year. Very few livestock owners in Borena rely on trucked-in water for their livestock (Table 3-12).

Consensus emerged from FGDs that drought is a key challenge and direct contributor to local conflict over access to pasture and water for livestock. Interestingly, FG participants used the severe drought that occurred “two to three years ago” (2011) as the reference point when discussing drought generally. Female FG participants in several Borena communities claimed they were still recovering from this drought in that they still have not replenished their herds. Nearly all FGD participants acknowledged that drought was becoming more frequent, placing a severe strain on traditional coping mechanisms (e.g., migration, selling cattle). Although FG participants in Borena recognize that drought has always been a risk, they feel it is getting worse and more frequent as a result of climate change, with one participant saying that “it used to occur every five years, now it occurs every two years.”

**Figure 3-9. Reasons Given for Why Water Is Less Available This Year than Last, by Project Area**



\*Indicates significantly different at the 0.05 level.

### 3.6 Differences in Results by PRIME IE Intervention Group

It is important to understand if there are differences across the two intervention groups, because any initial (baseline) differences will need to be accounted for in the final evaluation of project impact.

Looking at all of the quantitative information presented in this section, the values of several variables show a statistically significant difference across the LI and HI intervention groups. The differences are generally not very large, and most are likely related to the fact that the HI group is made up of a relatively higher proportion of pastoralists and a lower proportion of agro-pastoralists than the LI group (see Figure 3-10).

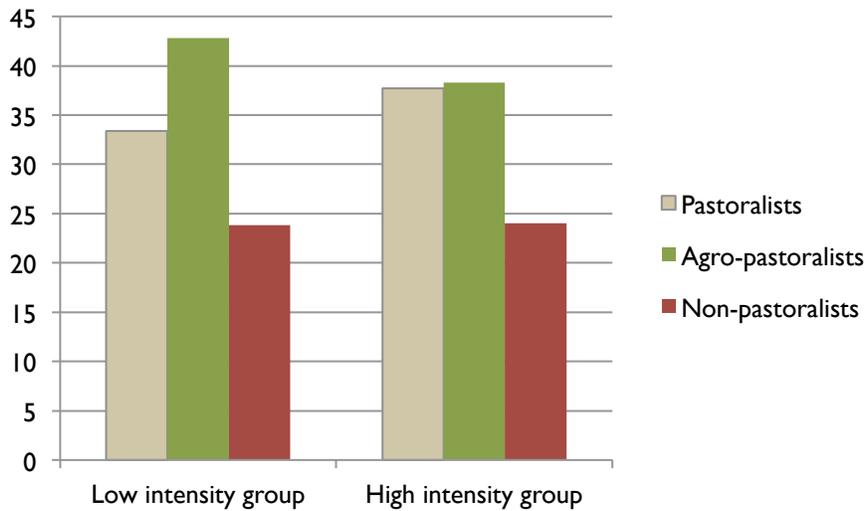
Focusing on the significant differences that are large enough to be important from a practical standpoint,<sup>29</sup> the main differences are:

- Tents (associated with mobility) are a more prevalent type of housing in the HI group and thatched huts (associated with sedentariness) are less prevalent (Table 3-3).
- Wage labor is a less prominent source of income in the HI group (Table 3-4).
- People in the HI group are less likely to migrate to seek an alternative income source. Similarly, a lower proportion of migrants sends remittances to their households (Table 3-5).
- HI group households are less likely to own oxen and poultry (Table 3-6).
- Children of HI households are more likely to consume milk (Table 3-10).

<sup>29</sup> See Smith and Subandoro (2007), Box 11, for a discussion of statistical significance and practical importance.

- The HI group is more reliant on private land for fodder and the LI group is more reliant on communal land (Table 3-11).

**Figure 3-10. Percent of Pastoralists, Agro-Pastoralists, and Non-Pastoralists, by Intervention Group**



***SUMMARY: Household and Community Livelihood Environment***

The baseline household survey data confirm that pastoralists and agro-pastoralists dominate the PRIME IE area. However, non-pastoralists make up a large proportion of households, nearly one-quarter. Pastoralism is more prevalent in Borena than Jijiga, while agro- and non-pastoralism are more prevalent in Jijiga. The main sources of food and income are farming and livestock rearing; wage labor and salaried work are major sources only among non-pastoralists. However, the predominant livelihood source for non-pastoralists is farming.

Most people in the IE area live in thatched huts or tents, do not have access to a latrine, and have limited access to clean drinking water. Demographically, the majority of households have both male and female adults. However, female-adult-only households, which can be more vulnerable to the effects of shocks, make up just over 10 percent of all households, rising to nearly one-fifth of non-pastoralist households. Another vulnerable group is households that have a member with a disability, which comprise one-tenth of all households. Approximately one-quarter of the male population has any formal education. Education is especially rare for females (8 percent).

The main challenges to livestock rearing are animal disease, land degradation due to invasive plant species, predators, drought, and overgrazing. Participation in livestock markets is widespread, but not universal: About 60 percent of all households either purchased or sold an animal in the year prior to the survey. Travel distances to markets, in addition to lack of information and means of communication, are factors limiting market participation.

Households in Borena tend to rely on communal sources of pasture, whereas many households in Jijiga own the lands on which their livestock graze or obtain fodder. Livestock owners in Borena report travel times to pasture nearly twice as long as those in Jijiga, which may be a function of their reliance on more distant communal lands. Recurrent migration is regularly used by pastoralists as a strategy to provide fodder and water for livestock. Reasons given for more permanent migration of a family member are to gain education or to seek alternative sources of income.

The commodities produced from livestock—meat, milk, and hides—are a vital part of the livestock production and marketing system. Households consume most of the meat, milk, and hides that they produce, and subsistence production dominates. Milk is an important source of protein and micronutrients for children under 5, with more than 75 percent consuming milk in the week prior to the survey. As would be expected, children’s milk consumption is highest in pastoralist households.

## Chapter 4. Well-Being Outcomes: Poverty, Food Insecurity, and Child Malnutrition

This Chapter presents baseline values of key well-being indicators used to evaluate the PRIME project's impact over time.

### 4.1 Poverty

Indicators of poverty capture households' ability to meet the basic survival needs of their members, such as food, shelter, and clothing. Households have two types of resources upon which to draw to meet these needs: their current income and assets they can rely on to generate future income and meet basic needs when current income is not sufficient. In this report, measures of both income-poverty and asset poverty are employed to give a full picture of the poverty situation in the PRIME IE area.

An income-based measure of poverty indicates whether a household currently has sufficient resources to meet its basic needs. Household incomes are measured using total per capita expenditures on food and non-food items.<sup>30</sup> For food, which usually makes up the largest proportion of household expenditures in developing countries, data are collected on cash purchases, food consumed from a household's own production, and food received in-kind. The poverty line below which a household is deemed to be poor is \$1.25 per day—the line used for the measurement of the Millennium Development Goal on extreme poverty and the line employed by the Feed the Future project. The equivalent poverty line in Ethiopian birr is derived using 2005 Purchasing Power Parity exchange rates. Expenditures are calculated using a spatial price deflator, a cost of living adjustment that reflects the fact that prices are generally higher in Jijiga than Borena.<sup>31</sup>

The alternative asset-based measure of poverty is based on household ownership of assets. It has a number of advantages over an income-based measure in this setting. First, asset poverty provides insight into long-lasting, structural poverty, whereas measurement based on current income may be picking up on only transitory, short-term poverty.<sup>32</sup> Second, asset poverty may more fully capture true “income” in the pastoralist setting because it takes into account the contribution of pastoralists' main asset—animals—to their well-being. Examining productive asset ownership, such as herd size, can reveal how pastoral households increase income and buffer themselves against shocks by asset protection and accumulation, perhaps even at the expense of current consumption.<sup>33</sup> Third, an asset-based poverty measure is more consistent with traditional wealth rankings and thus reflects people's

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<sup>30</sup> The expenditures questionnaire contains 71 food items and 42 non-food items.

<sup>31</sup> The spatial price deflators are calculated using price data for 27 food items for which sufficient data are available from both regions. Mean prices for each region are estimated using metric unit values, that is, households' expenditures divided by the reported quantity consumed translated into kilogram equivalents. The deflators are calculated using a Fisher's Ideal Price Index, which takes into account the proportion of each food in households' total expenditures in both regions.

<sup>32</sup> Carter and Barret (2006).

<sup>33</sup> Little, McPeak, Barrett and Kristjanson (2008).

own experiences of poverty. Last, unlike flow-based measures such as income, stock-based measures of asset holdings are more relevant for shock-prone settings such as the PRIME project area. This is because asset holdings are a resource for meeting basic needs when households are faced with a negative shock that reduces incoming income flows.<sup>34</sup>

For this study, asset poverty is measured based on three categories of asset ownership: consumer durables, agricultural productive assets, and animals. These asset types reflect the diversity of livelihoods in the study area, and are relevant to pastoralists, agro-pastoralists, and those mainly dependent on cash incomes. Consumer durables ownership is measured as the number of consumption assets owned out of a total of 11. Ownership of agricultural productive assets is measured as the number of productive implements owned out of 22. Animal ownership is measured in TLUs, as described in Chapter 3. An overall asset index is constructed using PCA based on the above three measures and placed on a 0-100 scale.<sup>35</sup> The poverty line is chosen as the index value yielding the same prevalence of poverty as the \$1.25/day line applied to total expenditures.<sup>36</sup> While such a choice may seem arbitrary, it does appear to identify the households with very few assets on which to rely. The average number of consumer durables owned by the poor is less than one out of 11 (0.56). The average number of agricultural productive assets is 5.9 out of a total of 21. The average number of animals owned is just 12.6,<sup>37</sup> which is quite low considering the mean number of animals is 20 and the maximum is near 300.

Table 4-1 presents the poverty estimates, revealing many strong differences across the two project areas and pastoral status groups. According to the expenditures poverty measure, 56.3 percent of households in the PRIME IE area are living in extreme poverty. This is far higher than the national prevalence of 31 percent.<sup>38</sup> The poverty gap, representing the depth of poverty (i.e., the percent by which the average household falls below the poverty line), is 22.4 percent.<sup>39</sup> The expenditures poverty prevalence is far higher among households in Borena than Jijiga (70.4 and 20.8 percent, respectively). While expenditures poverty is highest among pastoralists (60.7 percent), it varies relatively little across the pastoralist status groups. The percent of expenditures on food is near or

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<sup>34</sup> Tache and Sjaastad (2010).

<sup>35</sup> The scoring coefficients, calculated from the PRIME household survey data, for the three index components are: 0.61 for consumption assets, 0.54 for productive agricultural assets, and 0.58 for animals owned.

<sup>36</sup> The poverty line was chosen as the asset index value that yields a poverty prevalence of 56.3 (after weighting the data using the household sample weights). The value was found through iterative recalculations of the poverty prevalence at various asset index values.

<sup>37</sup> For ease of interpretation, this value is given as the number of animals owned rather than in TLUs.

<sup>38</sup> World Bank. 2014.

<sup>39</sup> More formally, the poverty gap is the mean shortfall from the poverty line (counting the non-poor as having zero shortfall) expressed as a percentage of the poverty line. This measure reflects the depth of poverty as well as its incidence. According to World Bank Basics of Poverty Reduction, an Inequality Analysis. Poverty gap index (PGI) is

calculated as 
$$PGI = \frac{1}{N} \sum_{j=1}^N \left( \frac{z - y_j}{z} \right)$$
 where  $N$  is the total population who are living at or below the poverty line,  $Z$  is the poverty line, and  $y_j$  is the income of poor household  $j$ .

more than 80 percent among all sub-groups, placing this population in what Smith and Subandoro (2007) term the “very vulnerable to food insecurity” category.<sup>40</sup>

**Table 4-1. Expenditures, Assets and Poverty**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
<b>Expenditures poverty (\$1.25 per day poverty line)</b>								
Poverty (%)	56.3	70.4 <sup>a</sup>	20.8 <sup>a</sup>	60.7 <sup>a</sup>	56.3 <sup>b</sup>	50.0 <sup>ab</sup>	59.8 <sup>a</sup>	48.3 <sup>a</sup>
Depth of poverty (poverty gap)	22.4	28.7 <sup>a</sup>	6.5 <sup>a</sup>	23.1	22.2	21.7	24.3 <sup>a</sup>	18.0 <sup>a</sup>
Per capita expenditures (daily birr)								
Total	16.8	12.1 <sup>a</sup>	28.6 <sup>a</sup>	15.2 <sup>a</sup>	16.8 <sup>b</sup>	19.3 <sup>ab</sup>	15.8 <sup>a</sup>	19.3 <sup>a</sup>
Food	13.7	9.9 <sup>a</sup>	23.1 <sup>a</sup>	12.6 <sup>a</sup>	13.7 <sup>b</sup>	15.4 <sup>ab</sup>	12.8 <sup>a</sup>	15.8 <sup>a</sup>
Non-food	3.1	2.2 <sup>a</sup>	5.5 <sup>a</sup>	2.7 <sup>a</sup>	3.1 <sup>b</sup>	3.9 <sup>ab</sup>	3.0	3.5
Percent of expenditures on food (mean)	81.9	83.0 <sup>a</sup>	78.9 <sup>a</sup>	83.2 <sup>a</sup>	81.7 <sup>a</sup>	80.2 <sup>a</sup>	82.1	81.4
Percent of food expenditures from three sources								
Purchases	45.6	45.6	45.8	44.5 <sup>a</sup>	41.9 <sup>b</sup>	54.0 <sup>ab</sup>	45.7	45.4
Home production	49.7	49.5	50.3	52.0 <sup>a</sup>	55.4 <sup>b</sup>	36.0 <sup>ab</sup>	49.9	49.3
Received in-kind	4.7	5.0	3.9	3.5 <sup>a</sup>	2.7 <sup>b</sup>	10.0 <sup>ab</sup>	4.4	5.2
<b>Asset poverty</b>								
Poverty (%)	56.3	48.2 <sup>a</sup>	76.2 <sup>a</sup>	45.0 <sup>a</sup>	53.7 <sup>a</sup>	78.0 <sup>a</sup>	54.2 <sup>a</sup>	61.0 <sup>a</sup>
Index of consumption assets <sup>c/</sup>	1.3	1.5 <sup>a</sup>	0.9 <sup>a</sup>	1.4 <sup>a</sup>	1.3 <sup>a</sup>	1.2	1.3	1.2
Index of productive assets <sup>d/</sup>	8.1	8.7 <sup>a</sup>	6.7 <sup>a</sup>	8.2 <sup>a</sup>	9.4 <sup>a</sup>	5.7 <sup>a</sup>	8.4 <sup>a</sup>	7.6 <sup>a</sup>
Animals owned (TLU's) <sup>e/</sup>	6.4	7.3 <sup>a</sup>	4.3 <sup>a</sup>	10.1 <sup>a</sup>	5.5 <sup>a</sup>	2.5 <sup>a</sup>	6.3	6.7
Overall asset index <sup>f/</sup>	49.3	50.2 <sup>a</sup>	47.0 <sup>a</sup>	51.0 <sup>a</sup>	50.1 <sup>a</sup>	45.2 <sup>a</sup>	49.4	48.8

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

<sup>c/</sup> Number of consumption assets owned out of 21.

<sup>d/</sup> Number of productive agricultural assets owned out of 22.

<sup>e/</sup> TLUs are tropical livestock units (see Section 3.5).

<sup>f/</sup> The asset index is constructed using principal components analysis and placed on a scale of 0 to 100.

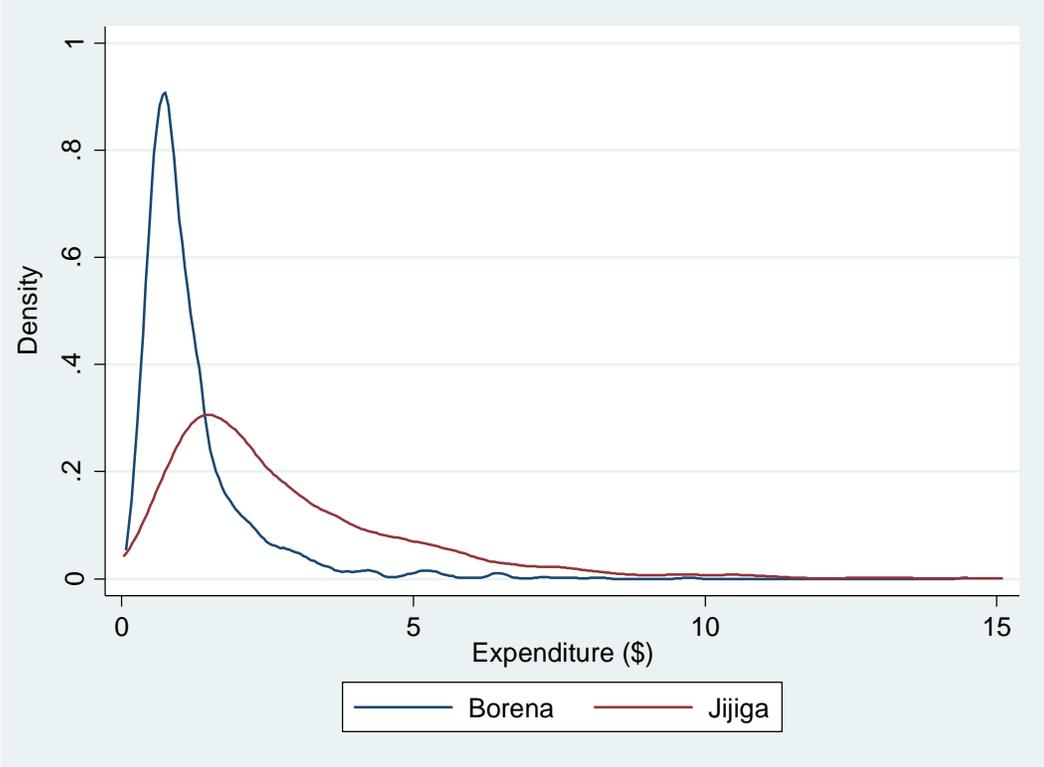
The percent of food expenditures deriving from purchases, home production, and received in-kind give further insight into differences across the groups. The population as a whole is highly reliant on subsistence production for meeting food needs, with half (49.7 percent) of all food expenditures coming from consumption of home-produced foods, such as grains, vegetables, meat, and dairy products. Pastoralists and agro-pastoralists are far more reliant on foods they produce themselves

<sup>40</sup> The four categories identified by Smith and Subandoro (2007) are: low, medium, high and very high (very vulnerable to food insecurity).

than non-pastoralists. As would be expected, non-pastoralists are more reliant on cash purchases of food. They are also more reliant on food received in-kind.<sup>41</sup>

Figure 4-1 shows the distributions of per capita expenditure for Borena and Jijiga. These distributions give the percentage of households at each level of expenditure, providing an idea of how unequal income distribution is in each region. The distribution for Borena is concentrated narrowly at the low end of the range of per capita expenditures. The distribution for Jijiga is wider, indicating that households have a broader diversity of current incomes. As such, the figure suggests that incomes in Jijiga are more unequally distributed than in Borena.

**Figure 4-1. Distribution of Per Capita Expenditures, by Project Area**



Asset-poverty, the measuring of structural, long-term deprivation, gives a very different picture than expenditures-poverty.<sup>42</sup> Asset poverty is higher in Jijiga than Borena (76.2 and 48.2 percent, respectively). By this measure, non-pastoralists are the most poor, followed by agro-pastoralists and pastoralists. As can be seen from the breakdowns of the asset index components, consumption assets, productive assets, and animals owned all tell the same story: Households in Jijiga and non-pastoralists are more likely to suffer from structural poverty than are households in Borena and are agro-pastoralists and pastoralists. In contrast to the expenditures measure, inequality among households in the distribution of asset poverty differs little across the regions (data not shown).

<sup>41</sup> Non-pastoralists are not more likely than the other pastoralist status groups to receive food aid (see Table 6-4 in Section 6). Thus this difference must be due to receipts of food as gifts from relatives, friends or neighbors.

<sup>42</sup> The overall prevalence is 56.3 by construction, that is, the poverty line was chosen such that the overall prevalence would match that of expenditures-based poverty.

## 4.2 Food Insecurity

Food security exists “when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.”<sup>43</sup> In this report, food security is measured using two types of indicators: indicators based on reports of food consumption and indicators that reflect respondents’ perceptions of and experiences with hunger and food insecurity.

### Consumption Indicators

#### *Per Capita Calorie Consumption and Undernourishment*

Per capita calorie consumption is the total calorie content of the food consumed by household members daily divided by household size.<sup>44</sup> Undernourishment is the percentage of households not meeting the average calorie requirements for light activity of all of their members. The average requirements are based on the age and sex composition of households. Undernourishment is a direct measure of insufficiency of food consumed for meeting household members’ needs for an active, healthy life. The method used for calculating these indicators is from Smith and Subandoro (2007).<sup>45</sup>

#### *Dietary Diversity Score*

The Dietary Diversity Score reflects the quality of households’ diets and is the total number of food groups, out of 12, from which household members consumed food in the last day. The indicator employed and calculation methods were developed by the USAID-funded Food and Nutrition Technical Assistance project.<sup>46</sup>

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<sup>43</sup> FAO. 2006.

<sup>44</sup> The quantities consumed of individual foods are measured as part of the expenditures module of the baseline survey. They are converted to metric equivalents and their calorie content using factors employed for the Ethiopia Rural Household Survey conducted by IFPRI. Conversion factors were supplemented, where necessary, by information from several other sources. The additional sources of *metric* conversion factors are: USDA (2014), Smith and Subandoro (2007), and the International Food Policy Research Institute AFINS project local unit conversion factor database (see Smith, Alderman and Aduayom 2006). The additional sources of *calorie* conversion factors are: USDA (2014), the International Food Policy Research Institute AFINS project calorie composition database and the AFINS project calorie data base for analysis of the Ethiopian Household Income, Consumption and Expenditure Survey 1999/2000 (see Smith, Alderman and Aduayom 2006), Calorie count (2014), and Fatsecret (2014).

<sup>45</sup> Smith and Subandoro (2007).

<sup>46</sup> Swindale and Bilinsky (2006).

## Experiential Indicators

### *Household Food Insecurity Access Scale (HFIAS)*

Also developed by Food and Nutrition Technical Assistance project,<sup>47</sup> the HFIAS is an index constructed from the responses to nine questions regarding people's experiences of food insecurity. Responses range from worry about not having enough food to actual experiences of food deprivation associated with hunger. Respondents indicate whether or not they or another household member experienced the event or feeling in question and, if yes, how often in the last 30 days (rarely, sometimes, or often). A score is calculated based on these frequency responses. The HFIAS is 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 worry, through concerns about dietary quality, and finally, experiencing an actual lack of food.

### *Household Hunger Scale (HHS) and Prevalence of Hunger*

The HHS is similar to the HFIAS but is based only on the three HFIAS questions pertaining to the most severe forms of food insecurity:<sup>48</sup>

1. 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?
2. In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?
3. 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?

Answers to the questions are used to construct a score on a scale of 0 to 6. The prevalence of hunger is then calculated as the percentage of households whose scale value is greater than or equal to two, which represents "moderate to severe hunger."

### *Coping Strategies Index*

The Coping Strategies Index is a scale taking into account the frequency and severity of coping strategies employed to deal with food insecurity.<sup>49</sup> The scale used here is based on nine coping strategies. Respondents are asked to report how many days in the last seven they employed each strategy. The index is calculated as a weighted average of the number of days a strategy was employed, where the weights reflect the severity of food insecurity associated with each strategy. It ranges from 0 to 217.7.

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<sup>47</sup> Coates, Swindale and Bilinsky (2007).

<sup>48</sup> Ballard, Coates, Swindale and Deitchler (2011).

<sup>49</sup> Maxwell and Caldwell (2008).

Table 4-2 reports on the consumption-based indicators of food security. The average per capita calorie consumption is 2,323 kilocalories per day. Overall, 45.6 percent of the population in the IE area do not eat enough food to meet their calorie needs for an active and healthy life and are thus undernourished.<sup>50</sup> Undernourishment is far higher in Borena than in Jijiga (52.1 and 29.3 percent, respectively). Pastoralists are more likely to be undernourished than agro- and non-pastoralists.

**Table 4-2. Food Security: Calorie Consumption, Undernourishment, and Dietary Diversity**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
<b>Calorie consumption and undernourishment</b>								
Per capita calorie consumption	2,323	2,143 <sup>a</sup>	2,769 <sup>a</sup>	2111 <sup>ab</sup>	2,465 <sup>a</sup>	2,383 <sup>b</sup>	2,300	2,374
Undernourishment (%)	45.6	52.1 <sup>a</sup>	29.3 <sup>a</sup>	54.9 <sup>ab</sup>	40.7 <sup>a</sup>	40.6 <sup>b</sup>	46.2	44.2
<b>Dietary diversity</b>								
Dietary diversity score	4.2	4.5 <sup>a</sup>	3.5 <sup>a</sup>	4.4 <sup>a</sup>	4.4 <sup>b</sup>	3.7 <sup>ab</sup>	4.3	4.2
<b>Consumption from food groups (percent)</b>								
Cereals	89.5	94.6 <sup>a</sup>	76.9 <sup>a</sup>	91.7 <sup>a</sup>	90.8 <sup>b</sup>	84.1 <sup>ab</sup>	90.2	88.0
Roots and tubers	11.3	11.2	11.6	8.5 <sup>a</sup>	11.8	14.4 <sup>a</sup>	10.6	13.0
Vegetables	24.6	27.3 <sup>a</sup>	18.0 <sup>a</sup>	19.7 <sup>ab</sup>	26.2 <sup>a</sup>	29.0 <sup>b</sup>	25.1	23.4
Fruits	4.8	5.0	4.5	1.7 <sup>ab</sup>	7.3 <sup>a</sup>	5.2 <sup>b</sup>	5.3	3.7
Meat	7.4	7.5	7.3	8.7 <sup>a</sup>	7.7 <sup>b</sup>	5.2 <sup>ab</sup>	7.8	6.6
Eggs	3.0	3.3	2.2	1.6 <sup>ab</sup>	3.5 <sup>a</sup>	4.2 <sup>b</sup>	3.2	2.4
Fish and seafood	2.9	2.8	3.4	1.7 <sup>a</sup>	4.0 <sup>a</sup>	2.9	3.0	2.7
Pulses, legumes and nuts	9.8	10.2	8.9	6.4 <sup>ab</sup>	12.0 <sup>a</sup>	11.0 <sup>b</sup>	10.8	7.7
Milk and milk products	77.6	85.1 <sup>a</sup>	59.1 <sup>a</sup>	89.8 <sup>a</sup>	80.0 <sup>a</sup>	55.7 <sup>a</sup>	79.1	74.3
Oils and fats	47.9	50.7 <sup>a</sup>	41.2 <sup>a</sup>	50.1 <sup>a</sup>	51.0 <sup>b</sup>	39.5 <sup>ab</sup>	47.9	47.9
Sugar and honey	78.3	80.9 <sup>a</sup>	71.8 <sup>a</sup>	89.2 <sup>a</sup>	76.6 <sup>a</sup>	65.2 <sup>a</sup>	75.9 <sup>a</sup>	83.5 <sup>a</sup>
Miscellaneous	65.8	76.1 <sup>a</sup>	40.4 <sup>a</sup>	71.0 <sup>a</sup>	68.6 <sup>b</sup>	53.1 <sup>ab</sup>	67.3	62.4

<sup>ab</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

With respect to dietary quality, the data on the percent of households consuming foods from the various food groups indicate that the quality of the diet is very poor throughout the IE area. The food groups most commonly consumed are cereals, milk and milk products, oils and fats, sugar and honey, and “miscellaneous” (e.g., condiments, spices, and beverages). Those that are important sources of micronutrients and protein—vegetables, fruits, meat, eggs, fish and seafood, and pulses, legumes, and nuts—are rarely consumed. The Dietary Diversity Score indicates that households in Borena have a higher quality diet than those in Jijiga, and that households engaging in pastoralism

<sup>50</sup> Note that the per-capita calorie requirement differs by household. The average daily per-capita calorie requirement is 2,020 kcals.

(whether pastoralists or agro-pastoralists) have higher dietary quality than those that do not. The food groups that contribute to higher dietary quality in Borena are cereals, vegetables, milk and milk products, and oils and fats. Those that drive pastoralists' and agro-pastoralists' higher dietary quality are cereals, milk and milk products, and oils and fats.

Turning to the experiential measures of food insecurity, the food security group breakdowns derived from the HFIAS indicate that nearly three-quarters of households in the project area are food insecure (Table 4-3). Almost one-fifth suffer from hunger, the most severe form of food insecurity.

While the overall prevalence of food security is roughly the same for Borena and Jijiga (25.9 and 29.8 percent, respectively), Jijiga households are more likely to experience its more severe forms. According to the HFIAS, 45.8 percent of Jijiga households are severely food insecure compared with 31.5 percent in Borena. Similarly, the percentage of households reporting hunger in Jijiga is more than double that in Borena, 31.5 versus 13.9 percent.

**Table 4-3. Food Security: Household Hunger Scale and Prevalence of Hunger**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
<b>Household food insecurity access scale</b>								
Mean	7.2	7.1	7.6	6.9 <sup>a</sup>	7.0 <sup>b</sup>	8.2 <sup>ab</sup>	7.2	7.3
Food security groups (%)								
Food secure	26.9	25.9	29.8	24.7	26.5	31.0	27.5	25.7
Mildly food insecure	3.8	3.7	3.9	4.0	3.4	4.0	3.6	4.1
Moderately food insecure	33.9	39.0 <sup>a</sup>	20.5 <sup>a</sup>	39.3 <sup>a</sup>	37.3 <sup>b</sup>	19.7 <sup>ab</sup>	34.0	33.5
Severely food insecure	35.4	31.5 <sup>a</sup>	45.8 <sup>a</sup>	32.0 <sup>a</sup>	32.8 <sup>b</sup>	45.2 <sup>ab</sup>	34.9	36.7
<b>Hunger</b>								
Household Hunger Scale	0.66	0.52 <sup>a</sup>	1.02 <sup>a</sup>	0.55 <sup>a</sup>	0.55 <sup>b</sup>	1.0 <sup>ab</sup>	0.66	0.66
Hunger (%)	18.8	13.9 <sup>a</sup>	31.5 <sup>a</sup>	15.2 <sup>a</sup>	16.2 <sup>b</sup>	28.6 <sup>ab</sup>	18.8	18.6

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

The overall mean of the Coping Strategies Index does not differ across households in Borena and Jijiga (Table 4-4), yet there are significant differences between the two project areas in the specific *types* of coping strategies households use when faced with food insecurity. Jijiga households are more likely to resort to borrowing food or relying on help from a friend or relative, to purchase food on credit, to send household members to eat elsewhere, or to prioritize the food consumption of working members over non-working members. Consistent with the results for the HHS, they are also more likely to resort to the extreme strategy of skipping entire days without eating. Borena households are more likely to limit portion sizes at mealtimes or reduce the number of meals eaten in a day. The Coping Strategies Index differs little by pastoralist status, but here, too, the data reveal some substantial differences in the use of specific coping strategies.

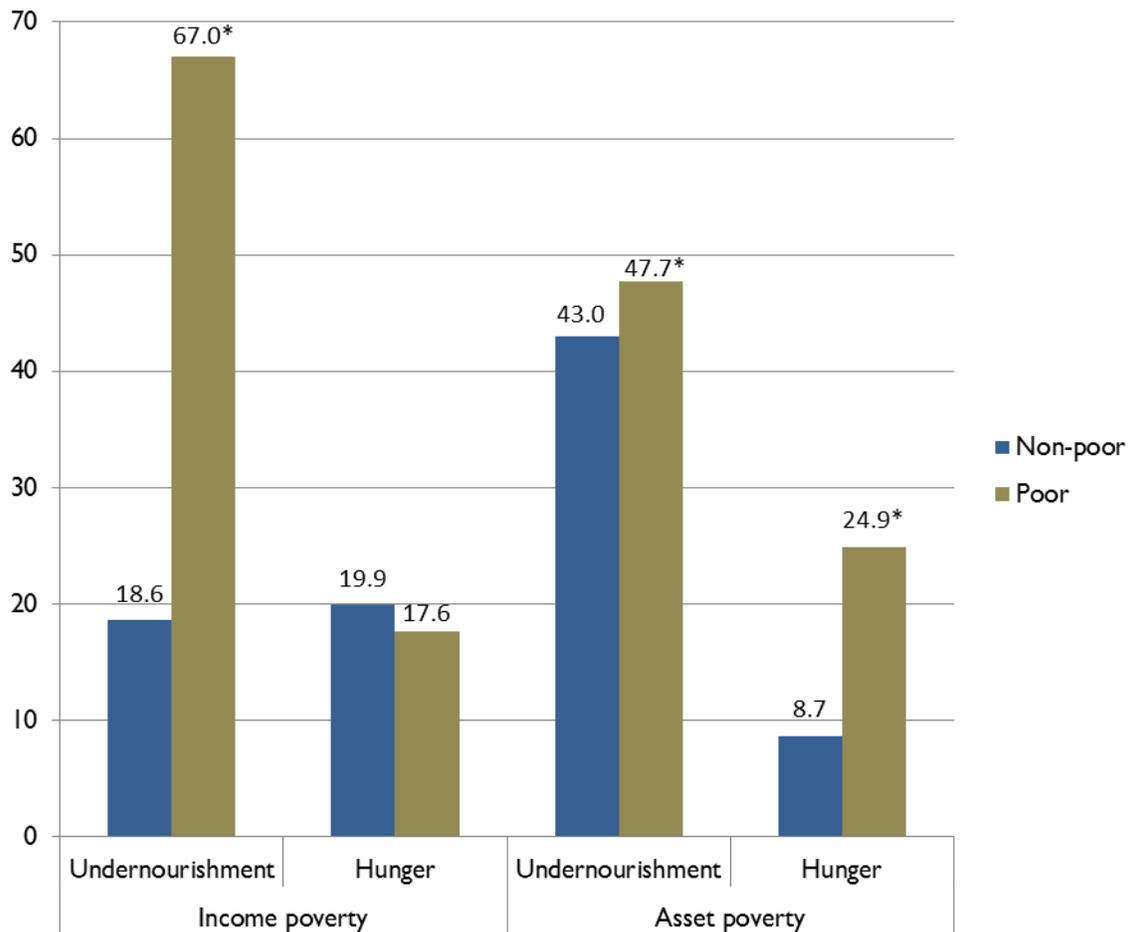
**Table 4-4. Food Security: Food Insecurity Coping Strategies and Coping Strategy Index**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
<b>Percent of households relying on various coping strategies</b>								
Rely on less preferred and less expensive foods	49.9	49.9	49.6	45.4 <sup>ab</sup>	52.0 <sup>a</sup>	52.6 <sup>b</sup>	50.2	49.1
Borrow food or rely on help from a friend or relative	32.9	28.9 <sup>a</sup>	43.0 <sup>a</sup>	29.0 <sup>a</sup>	32.5 <sup>b</sup>	39.4 <sup>ab</sup>	31.0 <sup>a</sup>	37.1 <sup>a</sup>
Purchase food on credit	27.8	23.5 <sup>a</sup>	38.8 <sup>a</sup>	26.1	28.9	28.4	27.1	29.5
Send household members to eat elsewhere	15.9	13.3 <sup>a</sup>	22.5 <sup>a</sup>	11.3 <sup>ab</sup>	17.1 <sup>a</sup>	20.3 <sup>a</sup>	15.3	17.2
Limit portion size at mealtimes	55.7	59.6 <sup>a</sup>	45.6 <sup>a</sup>	57.5	55.8	52.9	56.2	54.6
Restrict consumption by adults in order for small children to eat	34.0	34.3	33.4	34.5	33.2	34.7	34.8	32.4
Feed working members of household at the expense of non-working members	14.7	9.2 <sup>a</sup>	28.6 <sup>a</sup>	10.5 <sup>ab</sup>	17.4 <sup>a</sup>	15.9 <sup>a</sup>	13.9	16.4
Reduce number of meals eaten in a day	59.9	63.4 <sup>a</sup>	51.0 <sup>a</sup>	63.1 <sup>a</sup>	59.9	55.2 <sup>a</sup>	60.7	58.2
Skip entire days without eating	22.0	20.0 <sup>a</sup>	27.0 <sup>a</sup>	19.5 <sup>a</sup>	21.2 <sup>b</sup>	27.1 <sup>ab</sup>	21.9	22.2
<b>Coping strategies index</b>	23.6	23.4	24.0	21.6 <sup>a</sup>	23.6	26.3 <sup>a</sup>	23.1	23.8
(Higher: more food insecure)								

<sup>ab</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

Figure 4-2 provides a graphical view of the relationship between the consumption-based indicators of food insecurity (undernourishment and hunger) and poverty. The relationship clearly differs depending on the form of poverty being considered (i.e., income-based poverty or asset-based poverty). The prevalence of undernourishment is far higher among income-poor households than among those that are not (67 and 18.6 percent, respectively). The prevalence of hunger does not differ by income-based poverty group. Undernourishment is slightly higher among the asset poor than non-asset poor. However, hunger differs greatly across these two groups: The prevalence of hunger is nearly three times higher for the asset poor than the non-asset poor (24.9 versus 8.7 percent). These associations suggest that it is ownership of assets, rather than current income, that helps households avert the most extreme form of food insecurity represented by hunger.

**Figure 4-2. Prevalence of Undernourishment and Hunger, by Poverty Status**



\* Indicates significantly different at the 0.05 level.

### Insights from the Qualitative Data

There was general consensus among all FG participants and key informants that drought is the main driver of serious food shortages in the region. Female FG participants in Borena indicated that the unpredictability of rain makes it difficult or risky to cultivate crops. For example, they assert that too much rain last year prevented or made it difficult for households to plant, while too little rain this year resulted in little or no production. Not only do crops die from lack of water, but livestock are similarly affected by drought, and succumb to illness and/or death as pasture and water disappear during drought. As food becomes scarcer, FG participants indicated that malnutrition increases, with the most vulnerable (e.g., children, elderly, and pregnant women) most affected. After good rains, however, surplus harvest is stored underground and used during the dry or lean season.

*“Due to shortage of rainfall ... farming is limited. There is serious food shortage as a result: There is nothing to eat.”*

–Female FGD participant in Borena

Female FG participants in Borena also noted that they were relatively new to agricultural production, and had neither sufficient training (e.g., in crop diversification) nor land holdings to consistently produce enough food to last through the dry season. In one community in Borena, female FGD participants report that they were unsure of how to prepare the fruit from new trees they had planted that are now bearing fruit.

In addition to drought, flooding also contributes to food insecurity in Jijiga, where fields may be completely washed away. Male FG participants indicated that flooding used to be considered beneficial, replenishing soils with organic matter and nutrients. Now, however, floods are too destructive due to their increased intensity and are considered to negatively impact farming rather than rejuvenate it.

The impact of drought and floods on crop production notwithstanding, a key informant in Borena noted that agriculture was practiced primarily as a coping strategy, not a livelihood strategy. Farming is conducted at a subsistence level—meant primarily to augment livestock production—and barely provides sufficient food to last from harvest to harvest, let alone for marketing.

Furthermore, female FG participants reported that during food shortages, portion sizes are reduced and, if conditions persist or get worse, certain household members are given priority. In the worst cases, older children and adults will eat only once a day or once every other day, depending on the food available in the house.

Regarding borrowing food from a relative or neighbor, FGDs suggest that there are strong cultural norms to help the less fortunate, whether by providing food, grain, labor, wood, or money as “gifts,” or by sharing cattle, plows, or labor to prepare fields or reconstruct houses destroyed by floods.

*“In Somali culture it’s a shame to have cloth on your body while your neighbor doesn’t have one. We have a culture of “Gergera” (helping each other).”*

–Female FGD participant in Jijiga

One female FG participant in the Halahago *kebele* claimed that “hunger is no longer common” in their community, even during drought. Rather than “sitting and waiting for help,” they might collect firewood from the mountains to sell in the city, seek wage labor as maids, or even purchase *chat* for resale. In other words, women reported taking proactive steps to mitigate the effects of food shortages when possible.

### 4.3 Child Malnutrition

As noted in Chapter 2, sufficient and appropriate anthropometric data were collected only in the baseline survey for calculation of the prevalence of wasting. Wasting is a particularly relevant indicator in this shock-prone environment because it is a short-term indicator of poor nutritional status “that is sensitive to recent and severe events leading to a substantial weight loss, usually as a consequence of acute shortage of food or severe disease or both.”<sup>51</sup>

<sup>51</sup> Smith, LC., Ramakrishnan, U., Ndiaye, A., Haddad, L., and Martorell, R. 2003.

A child is considered to be wasted if her or his weight-for-height Z-score is below -2 standard deviations from the international reference. The current reference, employed here, is the World Health Organization 2006 Child Growth Standards.<sup>52</sup> It should be kept in mind that there is some controversy over whether these standards are applicable to pastoralist populations, among whom children under 5 tend to be exceptionally tall and thin. This growth pattern results in values for wasting prevalences that are exceptionally higher than the norm and values for stunting prevalences considerably lower, which may be linked to genetics rather than inadequate food consumption or poor health.<sup>53</sup>

As seen in Table 4-5, the prevalence of wasting, also known as Global Acute Malnutrition, in the PRIME IE area is 12.2 percent, somewhat higher than the Ethiopia-wide prevalence of 10.1 percent.<sup>54</sup>

**Table 4-5. Child Malnutrition: Wasting Among Children Under 5**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
Percent wasted	12.2	14.5 <sup>a</sup>	6.4 <sup>a</sup>	13.5 <sup>a</sup>	13.2 <sup>b</sup>	8.1 <sup>ab</sup>	12.8	10.9
Percent severely wasted	5.4	6.6 <sup>a</sup>	2.5 <sup>a</sup>	6.4 <sup>a</sup>	5.8 <sup>b</sup>	3.0 <sup>ab</sup>	5.8	4.4

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

The prevalence of wasting is more than twice as high in Borena (14.5 percent) as in Jijiga (6.4 percent). Severe wasting shows the same regional pattern. Since most households in both regions are either currently engaged in pastoralism or only recently exited from it, it is most likely that these differences are linked to children’s food consumption and/or health rather than to genetic differences between the groups.<sup>55</sup> The regional pattern is opposite to that found for hunger (the indicator most closely associated with an acute shortage of food), for which Jijiga has a much higher prevalence than Borena. Differences among the pastoralist status groups show the same opposite pattern to the prevalence of hunger, suggesting that severe food deprivation may not be a strong driver of wasting in the IE area.

Figure 4-3 reports the prevalence of wasting among children under 5 by poverty status. There is no statistically significant difference in this indicator for either expenditures poverty or asset poverty, indicating that poverty status has little bearing on acute child nutritional status. This finding is another indication that food deprivation is not a strong determinant of child wasting. The regression analysis in Chapter 7 gives further insight into the causes of wasting in the IE area.

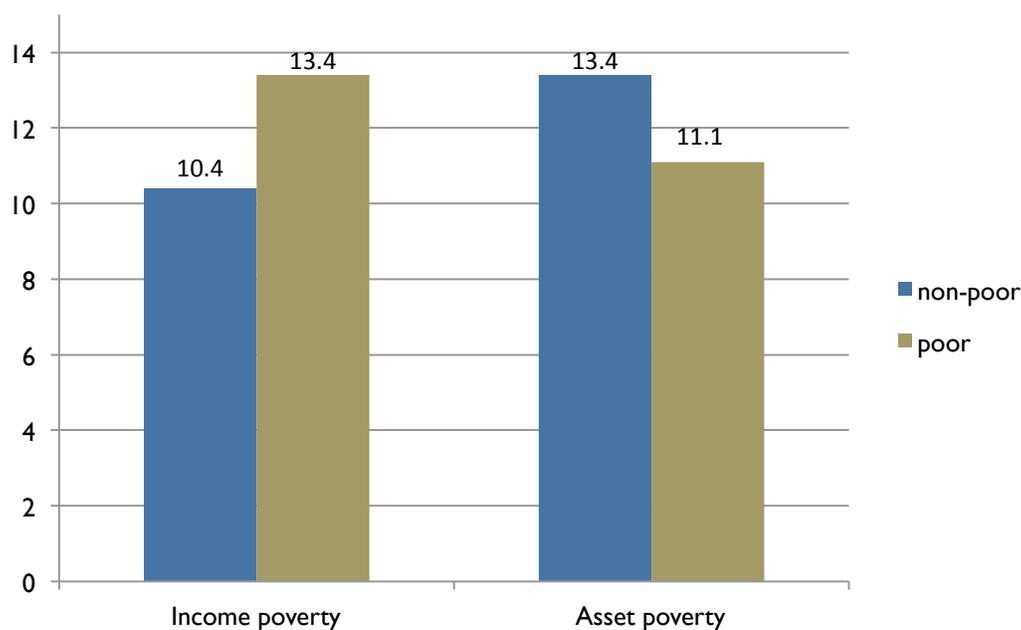
<sup>52</sup> de Onis, M., Garza, C., Victora, C.G., Bhan, M.K., and Norum, K.R. 2004.

<sup>53</sup> Crobler-Tanner, C. 2006.

<sup>54</sup> FAO. 2014.

<sup>55</sup> Information on health environment differences between the regions does not give any obvious clues as to why wasting differs so much between the regions: access to sanitation is worse in Jijiga, but access to safe water is worse in Borena (see Table 3-3).

**Figure 4-3. Prevalence of Wasting Among Children Under 5, by Poverty Status**



\* Indicates significantly different at the 0.05 level.

### **Insights from the Qualitative Data**

As previously noted, FG participants indicated that children as a group tend to be one of the most vulnerable to food insecurity. According to KIIs with health extension workers, nutrition screening usually occurs during vaccination campaigns, but the campaigns are severely understaffed (e.g., five health extension workers for approximately 2,600 households in Surupa *kebele*) and under-resourced. Interviewees also reported that there are often little or no supplementary/therapeutic foods available, even for those children diagnosed as malnourished. When children are diagnosed as severely malnourished, they are referred to a *kebele* health clinic. Lack of adequate transportation and road infrastructure are major issues preventing health extension workers from accessing remote and scattered rural communities. Malnutrition may be exacerbated when families migrate, as finding food becomes even more challenging under such stressful conditions. Health workers also suggest that polygamy and cultural reluctance to use family planning contribute to malnutrition, because it can be difficult for men to provide for children from multiple wives.

## **4.4 Differences in Results by PRIME IE Intervention Group**

As discussed in Chapter 3, the main differences being found in indicator values across the LI and HI intervention groups are related to the fact that the latter comprises a relatively higher proportion of pastoralists and a lower proportion of agro-pastoralists. Pastoralists tend to fare better when poverty measurement is based on assets than on total expenditures, and this difference is reflected here for the poverty measures.

The statistically-significant and practically important differences are:

- Expenditures poverty is lower in the HI group than the LI group
- Asset poverty is higher in the HI group (Table 4-1)

Notably, there is no difference across the intervention groups for the food security indicators and for child wasting.

***SUMMARY: Well-Being Outcomes: Poverty, Food Insecurity, and Child Malnutrition***

When per capita household expenditures—a measure of current income—is used for measurement, along with the \$1.25 poverty line, the prevalence of poverty is 56.3 percent in the PRIME IE area. This is far higher than the Ethiopia-wide prevalence of 30 percent. The expenditures poverty prevalence is more than three times higher in Borena than in Jijiga. However, incomes are more unequally distributed in Jijiga.

A different picture emerges when poverty is measured using asset ownership. By this measure of structural, long-term deprivation, a greater percent of households in Jijiga live in poverty than in Borena, where livestock ownership is higher. Thus, households in Jijiga, as well as non-pastoralists, are more likely to suffer from structural poverty than households in Borena and pastoralists.

Turning to food insecurity, 45.6 percent of the population in the IE area is undernourished: They do not eat enough food (calories) for an active, healthy life. Dietary quality is very poor. Apart from milk and milk products, food groups that are important sources of micronutrients and protein, such as fruits and vegetables, meat, eggs and legumes, are rarely eaten. Analysis of experiential indicators reveals that the food security situation in the area is very poor, with more than 75 percent of households suffering from food insecurity and nearly 20 percent from its most extreme form, hunger. The most commonly employed strategies for coping with food insecurity are relying on less preferred and less expensive foods, limiting portion sizes at meal times, and reducing the number of meals eaten in a day.

Undernourishment is far higher in Borena than Jijiga. However, dietary diversity is worse in Jijiga, and households are far more likely to experience hunger. Similarly, while pastoralists appear to eat less overall than agro- or non-pastoralists, non-pastoralists have the lowest diet quality and do the poorest on all experiential measures of food insecurity.

Examination of the relationships between the food security indicators and the poverty indicators suggests that it is ownership of assets, rather than current income, that helps households avert hunger.

The prevalence of wasting among children under 5, which may be related to acute food deprivation or severe disease or both, is 12.2 percent in the IE area. It is more than twice as high in Borena as in Jijiga, and more prevalent among pastoralists and agro-pastoralists than non-pastoralists. Neither expenditures poverty nor asset poverty appears to have a strong bearing on the prevalence of wasting.

## Chapter 5. Shock Exposure

The PRIME IE area is a highly shock-prone environment. Measuring the exposure of households to shocks is important for understanding resilience because resilience is essentially about being able to prepare for, withstand, and recover from shocks and stressors. This chapter presents baseline values for the types of and degree of exposure to shocks experienced by households in the PRIME IE area in the year prior to the baseline survey.

### 5.1 Types of Shocks Experienced in the Previous Year

Households in the PRIME IE area faced various shocks over the year prior to the baseline survey—including climate-related shocks, conflict-related shocks, and economic shocks (see Table 5-1). Overall, a full 86.8 percent of households experienced a shock. The most widely reported shock was an increase in food prices, cited by 63.5 percent of households; the next most widely reported shocks were livestock and crop diseases, drought, poor harvests, and increased prices of agricultural or livestock inputs. While a somewhat higher percentage of households in Borena were affected by food price increases than in Jijiga, they were equally felt by all pastoralist status groups. Exposure to drought also shows little difference across the pastoralist status groups, signifying that the livelihoods of all households in the IE area are somehow dependent on rain, over which they have no control.

Drought was more frequently cited as a shock in Jijiga than in Borena. By contrast, more than 25 percent of households in Jijiga reported flooding as a shock—more than twice the percentage in Borena. This regional difference is supported by FGDs in Jijiga, where participants mentioned flooding as a real threat to livelihoods and lives, whereas flooding was not mentioned in FGDs in Borena.

With the exception of food price increases, Jijiga households reported being exposed to economic shocks more than Borena households. Lack of availability of and increased prices for agricultural and livestock inputs are bigger problems in Jijiga. Households in Jijiga were also more likely to be unable to sell their agricultural or livestock products (i.e., no demand) or to suffer from lowered prices. And slightly more households in Jijiga reported experiencing an increase in the price of agricultural or livestock inputs.

Note that “death of a household member” is a more prevalent shock among non-pastoralists than the other pastoralist status groups and in Jijiga, where non-pastoralists are more predominant, than in Borena.

Although the quantitative data suggest that increases in food prices were the most widespread shock in the PRIME IE area over the previous year, there was consensus among all FGDs and KIIs that drought (i.e., lack of rainfall) is the main shock in the area. They also acknowledged that while drought has always been a risk where they live, the timing, intensity, and duration of drought—as well as of rain—have changed over the last 20 years.

**Table 5-1. Percent of Households Experiencing Various Shocks in the Last Year**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
<b>Climate shocks</b>								
Excessive rains	14.9	10.5 <sup>a</sup>	26.0 <sup>a</sup>	13.3 <sup>a</sup>	13.6 <sup>b</sup>	19.7 <sup>ab</sup>	15.2	14.4
Too little rain/drought	43.6	39.3 <sup>a</sup>	54.2 <sup>a</sup>	46.2	41.9	42.4	42.0	47.1
Livestock/crop disease	47.0	47.0	47.0	48.3 <sup>a</sup>	50.3 <sup>b</sup>	39.0 <sup>ab</sup>	46.9	47.0
Very bad harvest	40.3	40.0	41.1	37.1 <sup>a</sup>	45.7 <sup>ab</sup>	35.6 <sup>b</sup>	41.1	38.6
Landslides/erosion	14.4	13.3	17.3	13.9	15.6	13.1	16.1 <sup>a</sup>	10.5 <sup>a</sup>
<b>Conflict shocks</b>								
Theft of money	1.9	2.4 <sup>a</sup>	0.8 <sup>a</sup>	2.3	1.5	2.1	1.7	2.5
Theft of crops	1.5	1.4	1.7	1.3	2.0	0.8	1.4	1.7
Theft or destruction of assets	1.4	1.4	1.3	1.3	1.0	2.2	1.3	1.7
Theft of livestock	3.1	3.8 <sup>a</sup>	1.4 <sup>a</sup>	4.3 <sup>a</sup>	2.8	2.0 <sup>a</sup>	3.5	2.3
Destruction or damage of house due to raids	0.4	0.2	0.7	0.5	0.2	0.5	0.3	0.4
Loss of land due to conflict	1.1	1.2	0.7	1.2	0.9	1.2	1.0	1.1
Violence against household members	0.5	0.1 <sup>a</sup>	1.4 <sup>a</sup>	0.2 <sup>a</sup>	0.5	1.0 <sup>a</sup>	0.4	0.8
<b>Economic shocks</b>								
Sharp food price increases	63.5	66.2 <sup>a</sup>	56.6 <sup>a</sup>	65.7	61.7	63.2	62.8	65.1
Unavailability of agricultural or livestock inputs	23.0	14.9 <sup>a</sup>	42.6 <sup>a</sup>	21.7	24.0	23.3	21.5 <sup>a</sup>	26.5 <sup>a</sup>
No demand for agricultural or livestock products	16.6	10.9 <sup>a</sup>	30.8 <sup>a</sup>	15.9	18.0	14.9	15.6	18.8
Increase in price of agricultural or livestock inputs	38.7	37.0 <sup>a</sup>	42.9 <sup>a</sup>	40.1	39.2	35.6	38.8	38.6
Drop in price of agricultural or livestock products	23.5	20.8 <sup>a</sup>	30.2 <sup>a</sup>	24.2	23.7	21.9	23.7	23.0
Death of household member	4.2	2.7 <sup>a</sup>	7.9 <sup>a</sup>	2.7 <sup>ab</sup>	4.4 <sup>a</sup>	6.1 <sup>b</sup>	4.0	4.7
<b>Any shock in the last year</b>	<b>86.8</b>	<b>87.4</b>	<b>85.3</b>	<b>87.0</b>	<b>87.8</b>	<b>84.7</b>	<b>86.5</b>	<b>87.4</b>

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

Additionally, too much rain and flooding were cited as big problems in Jijiga. FGD participants there claim that they have to cope with alternating periods of drought and sudden, heavy rains that cause severe flooding. As a result of flooding, pastures and wells dug for water are often destroyed or damaged. The only plants that tend to survive the heavy floods are cactus (e.g., *berketete*), extensive patches of which in turn degrade farm and pasture lands. Men in Kudamatana *kebele* suspect increased flooding is due in part to deforestation in their area.

“[Drought] used to occur every five years, now it occurs every two years.”

—FGD participant in Borena

Although not specifically identified as a shock in the quantitative analysis, there was widespread belief by FGD participants in both regions that conflict constitutes a major shock or constant stressor within their

communities. However, the degree to which it is currently a problem varies by area. In Jijiga, FGs in some communities claim that, in general, inter-clan violence focused on access to grazing land and water has subsided in recent years. However, FGs in other communities report fairly recent episodes of conflict: Five men from Kudamatana *kebele* were reportedly killed in 2013 during skirmishes with neighboring Oromia communities. Residents of Tikdem *kebele* report having killed members of a “mountain” group that opposes the government, stating that the “last time they came to us and we killed them all.”

There may also be different perceptions of what constitutes “conflict.” Male FG participants in Tikdem *kebele* admitted that while there is tension over pasture and water during times of drought, conflict has not been a “major issue” recently because community elders from competing clans are able to resolve it through negotiation.

FG discussions of conflict were somewhat more consistent across groups in Borena, where conflict among tribes and clans is considered commonplace. Competition over limited pasturelands and cattle raiding are the primary drivers of conflict and affect the stability of communities. Though conflict over pasture and water is a long-standing issue, it is inevitably heightened in the wake of severe and/or sustained drought. Minority groups, in particular, seem to be highly affected and cite conflict as a key factor in their forced migration: They remain highly mobile in order to avoid conflict. In contrast, avoiding potential conflict by not migrating (and thus competing with others also seeking water and pasture) limits the ability of pastoralist groups to effectively deal with lack of adequate resources. Forced migration also leaves households vulnerable to the theft of major assets, such as houses and cattle. FG participants in Borena also suggested that cattle theft is a source of low-level conflict.

## 5.2 Perceived Severity of Shocks and Shock Exposure Index

As part of the household survey, respondents who reported that their household experienced a shock were subsequently asked, “How severe was the impact on your income and food consumption?” The five possible answers ranged from “None” to “Worst ever happened.” From these answers an additive score ranging from 1 to 5 was calculated to measure severity for each shock. As such, possible scores could range from 0 to 108. Table 5-2 reports on the perceived severity of shocks.

Those that are considered to have the most severe impact on households’ income and food consumption are drought, poor harvests, theft of livestock, sharp food price increases, livestock or crop disease, and theft of livestock. Drought is perceived to have a more severe impact for households in Borena than Jijiga and for pastoralists than agro- and non-pastoralists.

**Table 5-2. Perceived Severity of Shocks Among Those Who Experienced Shocks a/**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
<b>Climate shocks</b>								
Excessive rains	3.22	3.31	3.13	3.29 <sup>a</sup>	3.38 <sup>b</sup>	2.95 <sup>ab</sup>	3.24	3.18
Too little rain/drought	3.65	3.75 <sup>a</sup>	3.47 <sup>a</sup>	3.72 <sup>a</sup>	3.64	3.55 <sup>a</sup>	3.68	3.60
Livestock/crop disease	3.47	3.49	3.42	3.53 <sup>a</sup>	3.41 <sup>a</sup>	3.52	3.48	3.45
Very bad harvest	3.63	3.65	3.59	3.62	3.61	3.70	3.65	3.59
Landslides/erosion	3.38	3.42	3.31	3.44	3.38	3.29	3.42	3.25
<b>Conflict shocks</b>								
Theft of money	3.26	3.28	-	-	-	-	-	-
Theft of crops	3.30	-	-	-	-	-	3.26	-
Theft or destruction of assets	3.29	-	-	-	-	-	-	-
Theft of livestock	3.46	3.47	-	3.59	3.36	-	3.48	-
Destruction or damage of house due to raids	-	-	-	-	-	-	-	-
Loss of land due to conflict	-	-	-	-	-	-	-	-
Violence against household members	-	-	-	-	-	-	-	-
<b>Economic shocks</b>								
Sharp food price increases	3.54	3.53	3.58	3.63 <sup>a</sup>	3.47 <sup>a</sup>	3.52	3.54	3.53
Unavailability of agricultural or livestock inputs	3.39	3.31 <sup>a</sup>	3.47 <sup>a</sup>	3.43	3.40	3.34	3.37	3.44
No demand for agricultural or livestock inputs	3.33	3.48 <sup>a</sup>	3.19 <sup>a</sup>	3.39	3.34	3.20	3.37	3.24
Increase in price of agricultural or livestock inputs	3.35	3.32	3.42	3.41	3.29	3.36	3.38	3.28
Drop in price of agricultural or livestock inputs	3.35	3.32	3.40	3.44	3.30	3.28	3.37	3.30
Death of household member	3.32	3.41	3.25	3.31	3.25	3.42	3.43	3.12
<b>Index of shock exposure d/</b>	<b>11.5</b>	<b>10.7<sup>a</sup></b>	<b>13.6<sup>a</sup></b>	<b>11.8</b>	<b>11.8</b>	<b>10.8</b>	<b>11.5</b>	<b>11.6</b>

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

<sup>c/</sup> Perceived severity is measured on a 1-5 scale, with 1 being least severe and 5 being most severe.

<sup>d/</sup> The index of shock exposure is a weighted average of the incidence of occurrence of each shock (1=yes, 0=no), where the weights are the perceived severity of each shock experienced as measured on the 1-5 scale.

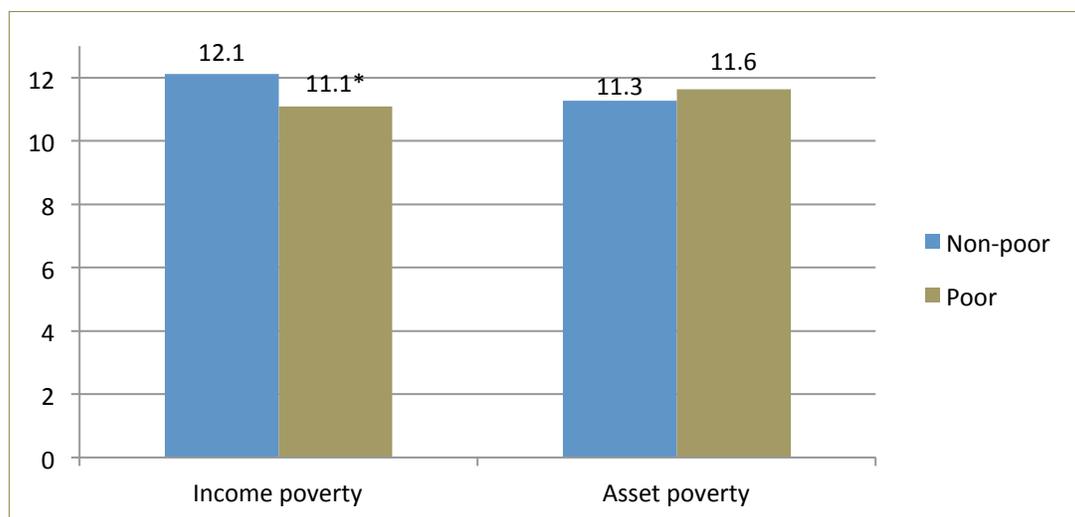
**NOTE:** Blank cells indicate that results are not statistically representative (n<=30).

Table 5-2 also reports a summary “shock exposure” index that will be used in additional analyses later in this report. Taking into account the number of shocks exposed to and their perceived severity, the index 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. Overall, Jijiga households are more exposed to shocks than Borena: The index is 27.1 percent higher in Jijiga. The difference is mainly because Jijiga households are more likely to experience excessive

rains, drought, and almost all of the economic shocks listed in Table 5-1. The index of shock exposure does not differ across the pastoralist groups.

Figure 5-1 shows means of the shock exposure index for the poverty groups. The quantitative data indicate that there was essentially no difference in shock exposure between the poor and non-poor in the year prior to the baseline survey. However, male FG participants in Jijiga suggest that the ability to cope with certain shocks such as drought does depend on wealth status, which gives different options for poor households and those who are better off (i.e., “rich”). While the rich can sell some livestock and purchase food and water (for the household or the remaining herd), the poor are forced to rely on family and clan members for support during times of need.

**Figure 5-1. Index of Shock Exposure, By Poverty Status**



\* Indicates significantly different at the 0.05 level.

### 5.3 Differences in Results by PRIME IE Intervention Group

The overall index of shock exposure does not differ across the HI and LI intervention groups. However, the percent of households that report experiencing a landslide or erosion is higher for the LI group (16.1 versus 10.5 percent), and the percent experiencing the unavailability of agricultural or livestock inputs is higher for the HI group (26.5 versus 21.5 percent).

### ***SUMMARY: Shock Exposure***

Detailed understanding of the shocks and stressors that affect households is required for effective resilience programming and for understanding whether projects designed to enhance resilience, such as the PRIME project, are actually doing so.

Attesting to the fact that the PRIME IE area is highly shock-prone, over 85 percent of households reported experiencing a shock in the year prior to the baseline survey. According to the quantitative data, the most common shock experienced was an increase in food prices. The next most widely reported shocks were livestock and crop disease, drought, poor harvests, and increased prices of agricultural or livestock inputs.

However, according to the qualitative data, it is the increased threat of severe, recurrent drought, accompanied in recent years by heavy flooding, that people perceive as the biggest threat they face on a continuing basis. The combination of alternating droughts and flooding has increased the frequency of shocks, and the dual nature of the shocks has increased stress on crop and livestock production. FGDs reveal that people have moved from considering drought to be a normal cyclical phenomenon that they were able to cope with to a more frequent disturbance that disrupts household stability and community life. Shocks underlie an increase in localized conflict between different groups that live in close proximity to each other. Conflict over pasture and water is a long-standing issue, but is exacerbated during severe or sustained drought. Because of the need to avoid conflict, pastoralist households lose flexibility in their ability to make the best migration decisions to ensure the survival of their animals.

The quantitative data indicate that, taking into account the number of shocks exposed to and the perceived severity of the shocks, households in Jijiga are more shock-exposed overall than households in Borena. This difference is mainly because Jijiga households are more likely to report experiencing excessive rains, drought, and a variety of economic shocks. Jijiga households are also more likely to report experiencing the death of a household member. While there are some differences by type of shock, overall shock exposure does not differ across the pastoralist, agro-pastoralist, and non-pastoralist groups.

## Chapter 6. Resilience Capacity

Given the working definition outlined in Section 1.4, resilience is a set of capacities that enable households and communities to effectively function in the face of shocks and stresses and still meet a set of well-being outcomes. In other words, resilience is the process by which individuals, households, and communities manage shocks and stresses in ways that lead to more positive outcomes than would otherwise be predicted without such capacities. This chapter starts by reporting on households' perceived abilities to recover from shocks and the coping strategies they use to manage them. It then presents data on indicators of resilience capacity, including:

- Psychosocial measures of resilience capacity
- People's aspirations and confidence to adapt
- Access to social capital (bonding, bridging, and linking)
- Livelihood diversity, ownership of productive assets, and access to financial resources
- Access to markets, services, infrastructure, and information
- Availability of disaster planning and response services

Last, summary indexes of the three dimensions of household resilience capacity—absorptive capacity, adaptive capacity, and transformative capacity—are presented. The chapter ends with a discussion of community resilience in the PRIME IE area.

### 6.1 Past Shocks: Ability to Recover and Coping Strategies

As seen in Chapter 5, the PRIME IE areas are subject to a variety of frequent, recurring shocks, and it is important to understand households' ability to recover from shocks and the coping strategies they employ to manage them.

#### *Ability to Recover from Shocks*

Households' subjective reports of their ability to recover from actual shocks they experience is a key source of information on the strength of their resilience. Table 6-1 presents information on the perceived ability of households to recover from shocks typical of the PRIME IE survey areas, presented by project area, pastoralist status, and PRIME intervention group. The table shows the percent of households exposed to shocks in the year prior to the survey that report having recovered from the shock.<sup>56</sup> A household is classified as having recovered if the chosen answer to the household survey question "To what extent were you and your household able to recover?" was one of the following:

1. Recovered to same level as before
2. Recovered and better off
3. Not affected<sup>57</sup>

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<sup>56</sup> See Table 5.1 for the percent of households experiencing each shock.

<sup>57</sup> The other possible responses were, "Did not recover" and "Recovered some, but worse off than before."

**Table 6-1. Perceived Ability to Recover from Various Shocks**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
<b>Climatic shocks</b>								
Excessive rains	31.4	44.9 <sup>a</sup>	17.7 <sup>a</sup>	35.8	32.2	26.0	34.9 <sup>a</sup>	23.0 <sup>a</sup>
Too little rain/drought	40.1	49.5 <sup>a</sup>	23.0 <sup>a</sup>	47.5 <sup>ab</sup>	38.0 <sup>a</sup>	31.9 <sup>b</sup>	43.1 <sup>a</sup>	34.0 <sup>a</sup>
Livestock/crop disease	43.3	52.5 <sup>a</sup>	19.9 <sup>a</sup>	49.7 <sup>ab</sup>	42.1 <sup>a</sup>	34.2 <sup>b</sup>	45.4	38.5
Very bad harvest	35.0	39.6 <sup>a</sup>	23.7 <sup>a</sup>	40.5 <sup>a</sup>	34.9 <sup>b</sup>	26.8 <sup>ab</sup>	36.7	31.0
Landslides/erosion	40.4	49.8 <sup>a</sup>	22.3 <sup>a</sup>	49.9 <sup>a</sup>	39.2	28.1 <sup>a</sup>	40.3	40.6
<b>Conflict shocks</b>								
Theft of money	52.1	53.2	-	-	-	-	-	-
Theft of crops	40.6	-	-	-	-	-	39.4	-
Theft or destruction of assets	58.2	-	-	-	-	-	-	-
Theft of livestock (raids)	40.9	40.8	-	37.9	45.3	-	37.7	-
Destruction or damage of house due to violence	-	-	-	-	-	-	-	-
Loss of land due to conflict	-	-	-	-	-	-	-	-
Violence against household members	-	-	-	-	-	-	-	-
<b>Economic shocks</b>								
Sharp food price increase	45.0	53.8 <sup>a</sup>	18.6 <sup>a</sup>	50.7 <sup>a</sup>	46.6 <sup>b</sup>	33.4 <sup>ab</sup>	48.0 <sup>a</sup>	38.5 <sup>a</sup>
Unavailability of agricultural or livestock inputs	38.5	56.3 <sup>a</sup>	23.5 <sup>a</sup>	49.3 <sup>a</sup>	38.4 <sup>b</sup>	23.0 <sup>ab</sup>	42.0 <sup>a</sup>	32.0 <sup>a</sup>
No demand for agricultural or livestock products	43.4	51.3 <sup>a</sup>	36.4 <sup>a</sup>	45.8 <sup>a</sup>	47.4 <sup>b</sup>	30.5 <sup>ab</sup>	44.0	42.1
Increase in price of agricultural or livestock inputs	46.9	57.8 <sup>a</sup>	23.7 <sup>a</sup>	50.1 <sup>a</sup>	48.0	38.9 <sup>a</sup>	49.4	41.2
Drop in price of agricultural or livestock products	52.5	67.6 <sup>a</sup>	26.6 <sup>a</sup>	62.6 <sup>ab</sup>	47.3 <sup>a</sup>	46.1 <sup>b</sup>	54.5	47.9
Death of household member	39.7	44.8	35.3	41.4	41.6	36.1	40.4	38.4
<b>Perceived ability to recover index</b>	<b>2.25</b>	<b>2.41<sup>a</sup></b>	<b>1.85<sup>a</sup></b>	<b>2.35<sup>a</sup></b>	<b>2.24</b>	<b>2.12<sup>a</sup></b>	<b>2.30<sup>a</sup></b>	<b>2.15<sup>a</sup></b>

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

**NOTE:** Blank cells indicate that results are not statistically representative, n<=30.

Most households reported that they had not recovered from the shocks they had experienced in the previous year. The percent able to recover from the most commonly experienced shocks includes:

- Sharp food price increases: 45 percent
- Livestock/crop disease: 43.3
- Too little rain/drought: 40.1
- Very bad harvest: 35.0
- Increase in price of agricultural or livestock inputs: 46.9

See Table 5-1 for the most common shocks.

There is a pronounced difference in the ability to recover from shocks between the PRIME IE areas, with households in Borena reporting a greater perceived ability to recover from shocks in every category as compared with those in Jijiga. The largest gap occurs in households' perceived ability to recover from economic shocks. Households in Borena reported greater ability to recover from a drop in the price of agricultural or livestock products, sharp increases in food prices, and increases in the price of agricultural or livestock inputs. Prices are generally lower in Borena than in Jijiga (see Section 4.1), which may soften the impact of economic shocks for Borena households and make recovery easier. Borena residents also reported greater perceived ability to recover from climatic shocks, especially from livestock and crop disease.

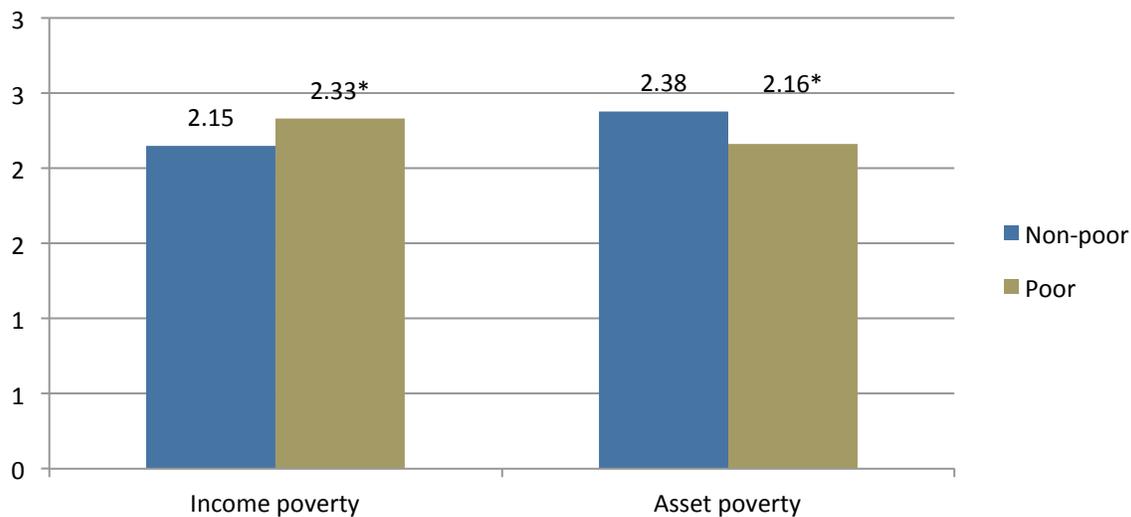
Pastoralists show a higher perceived ability to recover from climatic shocks than agro- and non-pastoralists, perhaps reflecting their ability to migrate in search of water and pasture. Pastoralists also report a stronger ability to recover from most of the economic shocks.

The bottom of Table 6-1 shows the “perceived ability to recover index,” a summary measure of households' overall ability to recover. The index is calculated from the responses to the question, “To what extent were you and your household able to recover?” which was asked only of households that were exposed to various shocks. Responses are based on a 5-point scale of household perceptions of their ability to meet income and food needs. (For more information on index creation, see Appendix 1.)

Consistent with the data in the rest of the table, households in Borena have a significantly higher perceived ability to recover from shocks than households in Jijiga. Pastoralists rank higher on the index of perceived ability to recover than non-pastoralists. The index value for agro-pastoralists shows no statistical difference from that of the other two pastoral status groups.

Figure 6-1 shows the perceived ability to recover from shocks by poverty status. A household's asset base determines its ability to recover; accordingly, asset-poor households perceive themselves as slightly less able to recover from shocks than non-asset-poor households. Income poverty does not have the expected relationship with households' ability to recover, indicating once again that income, as measured by total expenditures, is not as useful an indicator of households' economic status as asset ownership in this pastoralist setting.

**Figure 6-1. Perceived Ability to Recover Index, by Poverty Status**



\* Indicates significantly different at the 0.05 level.

### **Shock Coping Strategies**

Table 6-2 presents information on coping strategies households used in response to stressful events in the past year. The strategies are grouped into four types: changing livestock and land holdings, migration, reducing current expenditures, and getting more food or money.

The most common coping strategies are reducing food consumption and selling livestock, with about two-thirds of households citing each. Other common strategies are sending livestock in search of pasture (53 percent of households), taking out a loan from a friend or relative (44.3 percent), and receiving money or food from family members (31 percent). Migration is not a preferred strategy, although approximately one-fifth of pastoralist and agro-pastoralist households will send some family members away to cope with shocks. The receipt of food aid from government or an NGO, or participating in food-for-work or cash-for-work is used by a substantial minority of respondents as a coping strategy.

In contrast to the large percent of households resorting to reducing food consumption and selling off livestock, an important productive asset, only about 10 percent of households reported taking children out of school to save on expenses. Note, however, that male FG participants in Gursum *kebele* in Jijiga report that withdrawing children from school is a common coping mechanism.

**Table 6-2. Coping Strategies in Response to Shocks**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
<b>Change livestock and land holdings</b>								
Send livestock in search of pasture	53.0	51.2 <sup>a</sup>	57.7 <sup>a</sup>	62.7 <sup>a</sup>	55.1 <sup>a</sup>	34.2 <sup>a</sup>	51.1	57.2
Sell livestock	67.1	68.3	64.2	78.3 <sup>a</sup>	70.8 <sup>a</sup>	43.5 <sup>a</sup>	66.3	69.0
Slaughter livestock	17.6	16.6	20.2	25.4 <sup>ab</sup>	13.7 <sup>a</sup>	12.7 <sup>b</sup>	16.0 <sup>a</sup>	21.3 <sup>a</sup>
Lease out land	3.5	0.5 <sup>a</sup>	11.3 <sup>a</sup>	1.9 <sup>a</sup>	4.8 <sup>a</sup>	3.4	3.2	4.1
<b>Migration</b>								
Migrate (some members)	20.9	19.9	23.5	26.9 <sup>a</sup>	20.4 <sup>a</sup>	12.6 <sup>a</sup>	19.4 <sup>a</sup>	24.2 <sup>a</sup>
Migrate (whole family)	5.5	4.5 <sup>a</sup>	8.2 <sup>a</sup>	6.1	4.9	5.7	5.6	5.3
Send member to a relative	9.2	6.4 <sup>a</sup>	16.5 <sup>a</sup>	6.0 <sup>ab</sup>	10.8 <sup>a</sup>	11.2 <sup>b</sup>	8.2 <sup>a</sup>	11.6 <sup>a</sup>
<b>Coping strategies to reduce current expenditure</b>								
Take children out of school	9.9	8.2 <sup>a</sup>	14.6 <sup>a</sup>	8.2	10.7	11.1	9.3	11.4
Move to less expensive house	4.7	4.0 <sup>a</sup>	6.5 <sup>a</sup>	4.5	4.6	5.2	4.6	5.0
Reduce food consumption	67.5	71.7 <sup>a</sup>	56.2 <sup>a</sup>	69.4 <sup>a</sup>	69.5 <sup>b</sup>	61.0 <sup>ab</sup>	68.5	65.2
<b>Coping strategies to get more food or money</b>								
Take up new wage labor	26.7	30.5 <sup>a</sup>	16.7 <sup>a</sup>	19.6 <sup>ab</sup>	31.1 <sup>a</sup>	29.4 <sup>b</sup>	28.5	22.6
Sell household items	2.2	1.1 <sup>a</sup>	5.1 <sup>a</sup>	1.1 <sup>ab</sup>	2.4 <sup>a</sup>	3.6 <sup>b</sup>	2.1	2.6
Sell productive assets	1.8	0.9 <sup>a</sup>	4.2 <sup>a</sup>	1.1 <sup>a</sup>	2.5 <sup>a</sup>	1.7	1.8	1.9
Take out loan from								
NGO	1.6	2.0 <sup>a</sup>	0.5 <sup>a</sup>	2.2	1.3	1.3	1.8	1.3
Bank	1.0	1.2	0.5	0.6	1.1	1.3	1.0	0.9
Money lender	9.2	10.6 <sup>a</sup>	5.5 <sup>a</sup>	11.0 <sup>a</sup>	9.4 <sup>b</sup>	6.3 <sup>ab</sup>	10.3	6.8
Friends/relatives	44.3	47.6 <sup>a</sup>	35.8 <sup>a</sup>	48.0 <sup>a</sup>	44.7 <sup>b</sup>	38.2 <sup>ab</sup>	45.4	41.9
Send children to work	4.3	3.6 <sup>a</sup>	5.9 <sup>a</sup>	2.4 <sup>ab</sup>	4.8 <sup>a</sup>	6.1 <sup>b</sup>	4.3	4.2
Receive money or food from family members	31.0	32.1	28.2	32.3	29.8	31.3	32.2	28.4
Receive food aid from gov't	15.1	16.8 <sup>a</sup>	10.9 <sup>a</sup>	17.1 <sup>a</sup>	13.8 <sup>a</sup>	14.6	15.5	14.3
Receive food aid from NGO	15.3	17.7 <sup>a</sup>	9.0 <sup>a</sup>	18.9 <sup>a</sup>	14.5	11.3 <sup>a</sup>	16.2	13.1
Participate in food-for-work or cash-for-work	25.6	28.8 <sup>a</sup>	16.9 <sup>a</sup>	27.6 <sup>a</sup>	27.5 <sup>b</sup>	19.0 <sup>ab</sup>	26.4	23.6
Use money from savings	10.9	12.9 <sup>a</sup>	5.4 <sup>a</sup>	11.4	11.9	8.2	11.8	8.7
Remittances	7.4	7.9	6.0	8.9 <sup>a</sup>	5.9 <sup>a</sup>	7.6	7.8	6.2
Other	1.1	0.6 <sup>a</sup>	2.7 <sup>a</sup>	0.5 <sup>a</sup>	1.8 <sup>a</sup>	0.9	1.3	0.8

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

**NOTE:** The data are only presented for the households that experienced at least one shock in the last year (86.8 percent of households).

The predominant coping strategies used by households differ in Borena and Jijiga. Some of the strongest differences are that Jijiga households are more likely to:

- Lease out land
- Migrate the entire households or send a household member to a relative
- Take children out of school or send children to work

Borena households are more likely to:

- Reduce food consumption, take up new wage labor
- Receive food aid or other assistance from the government or an NGO

As would be expected, pastoralists are more likely than the other groups to use a change in livestock holdings to cope with shocks. They are also more likely to receive food aid or other assistance from the government or an NGO. Agro- and non-pastoralists are more likely to send a member to a relative or take up new wage labor.

### **Additional Insights on Shock Recovery and Coping from the Qualitative Data**

The qualitative data provide deeper insight into households' ability to recover from shocks and the coping strategies they use in response to them. Female FG participants in Jijiga (Gursum *kebele*) repeatedly stated that the “pure pastoralists” in the community are least prone to disaster because, in the event of a shock, they can sell one or two cattle to make sure that basic needs are met. Those who are more dependent on agriculture state that they do not have the same capacity to cope.

As noted in Chapter 5, nearly all FG participants observed that drought was becoming more frequent and was placing a severe strain on traditional coping strategies (e.g., migration, selling cattle). In Borena, female FG participants indicated that they were still recovering from a major drought that struck the community three years ago, and that they had not fully replenished their livestock. Male FG participants in Jijiga area said that as a result of the large number of animals lost to drought, disease, or asset divestment, they had largely stopped using migration as a coping strategy. Presumably, they are referring to the regular type of migration associated with transhumance.

FG participants also pointed out measures they take as a community to help households recover from disasters. Female FG participants indicated that multiple communities in Borena have learned to cope with shocks by preparing pasture banks (for fodder storage), collecting and storing fodder, developing ponds, and digging wells. Traditional community leaders set rules on how to use the pasture banks economically. They indicated that men engage in collective action in the form of planting trees.

Male FG participants in Jijiga (Gursum *kebele*) report that they have come together as a community to take actions to prevent flood damage. They tried to change the course of the water, but subsequent floods quickly destroyed the channels and embankments. As a result, the men feel that flood risk is beyond their capacity to deal with it. They note that though PSNP helps to develop

terraces to prevent erosion, they provide no protection along major flood lines. Female FG participants also report building terraces in an effort to mitigate flooding, with the same result. The terraces do not protect land when high rainfall comes; “It’s out of our capacity,” they stated. The women also indicated that there “is nothing which has been done by elders and community leaders to reduce this problem and nobody has been informing us this flood is coming.”

Male FG participants in Jijiga (Tikdem *kebele*) report that in times past, they used to work in groups with clan members to cope with the adverse effects of flooding. However, the intensity of the floods is increasing and they have ceased their previous efforts to solve the issue. They continue to communicate with family and clan members in the event of floods and, if possible, will share farm lands that are unaffected by flood. They reasserted, however, that the intensity and magnitude of the flood does not allow sharing like in times past.

According to FG participants in Jijiga, the rich can survive shocks and stresses by selling one or two cattle “before the shock began.” They report that wealthier households purchase food for the family and travel in search of pasture and water. In Borena, FG participants commented that households that have plenty of livestock sell some of the animals to support family members who stay in the village during migration. However, poor households with few livestock do not sell their animals, fearing that they may be left with no livestock if drought kills the few that remain. Livestock is a valuable asset that households cannot afford to lose; therefore, poor households with few livestock often migrate with *all* household members rather than leaving some behind.

In Borena, female FG participants said migration is a common strategy for coping with the impacts of drought, but it is resorted to only during severe and/or prolonged drought. They also reported that when men and boys migrate in search of pasture, they leave one cow at home to provide milk to the women and children. This behavior highlights how much those who have cattle depend on the milk and blood of living animals. If drought persists or worsens, women are permitted to sell the cow to meet food needs. When households lose all their livestock to drought or disease, the men often migrate to find daily labor. For example, men would migrate from Borena to Kenya and Jijiga to Harar so they can send money to their families. Labor migration is reportedly more common in communities near the border.

Male FG participants in Borena report that they sell their cattle and purchase grain to eat during times of drought, because household agricultural production is only sufficient to meet food needs for one to two months. They slaughter animals for food only when there is no other alternative, and share what they have with those who have nothing to eat.

FGDs revealed that in times of stress, women in Borena collect firewood and make charcoal to sell on the roadside and to nearby villages in order to buy food. Farmers used to grow *chat* as a cash crop, but traditional leaders criticized it and the crop was often stolen. Though stealing as a coping strategy is highly discouraged by the community, theft occurs within communities and between tribes. The community has strong traditional rules and regulations to punish those who are involved in theft.

## 6.2 Psychosocial Measures of Resilience Capacity: Aspirations and Confidence to Adapt

Psychosocial capabilities, such as by self-esteem and agency, are important traits that are hypothesized to give people greater resilience in the face of shocks. Recent research in Ethiopia has pointed to low self-esteem, low aspirations, and a fatalistic view among the poor as intrinsically linked with their inability to take action to improve their material well-being.<sup>58</sup> Such traits would be particularly disabling in the face of shocks, which require quick adaptation to successfully cope.

*“They said God knows about the future. If they get good rain in the future and if animal disease won’t appear, they believe they may be fine.”*

–FGD participant in Borena

Table 6-3 presents means of an index of “aspirations and confidence to adapt,” along with those for index sub-components, by project area, pastoralist status, and PRIME intervention group. The three index components are absence of fatalism, belief in individual power to enact change, and exposure to alternatives to the status quo. These concepts were chosen because each is believed to be positively associated with having aspirations and confidence to adapt to change.<sup>59</sup> The methods for calculating the sub-indexes and the overall index are detailed in Appendix 1.

**Table 6-3. Aspirations and Confidence to Adapt**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
<b>Index of aspirations and confidence to adapt</b>	<b>28.9</b>	<b>29.6<sup>a</sup></b>	<b>27.0<sup>a</sup></b>	<b>28.4</b>	<b>29.0</b>	<b>29.3</b>	<b>29.1</b>	<b>28.2</b>
<b>Index components</b>								
Absence of fatalism	44.8	44.4	46.1	40.5 <sup>ab</sup>	47.5 <sup>a</sup>	46.8 <sup>b</sup>	45.1	44.3
Belief in individual power to enact change	59.9	64.3 <sup>a</sup>	49.2 <sup>a</sup>	63.0 <sup>ab</sup>	58.5 <sup>a</sup>	58.6 <sup>b</sup>	60.8	57.8
Exposure to alternatives to the status quo	4.8	4.4 <sup>a</sup>	5.9	4.5	4.5	5.7	4.7	4.9

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

According to the index, aspirations and confidence to adapt is slightly higher in Borena than Jijiga. The difference is due to stronger belief in individual power to enact change in Borena. There is no difference in the index across the pastoralist status groups. However, pastoralists are more likely to have fatalistic attitudes (the absence of fatalism is lower) and have stronger belief in the individual power to enact change. The indexes for the sub-components of the overall aspirations and confidence to adapt index are constructed to be comparable with each other. Each ranges from 0 to 100. The values of the indexes (for the PRIME IE population as a whole) are quite high for all but

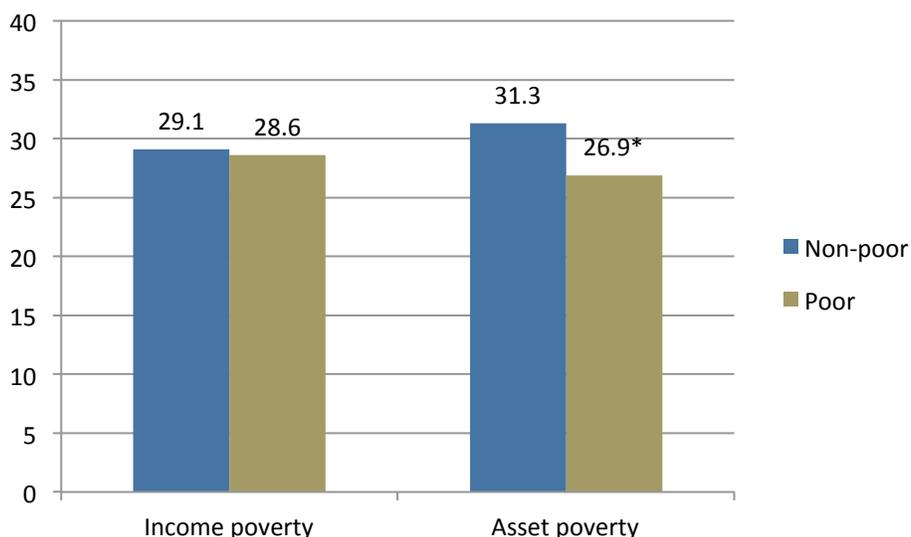
<sup>58</sup> Bernard et al. 2012.

<sup>59</sup> An alternative terminology used in personality psychology for this aspect of resilience is “locus of control,” defined as “The extent to which people believe they have power over events in their lives” (Fournier 2009).

the index of exposure to alternatives to the status quo, which has a very low value. This indicates that there is either very little opportunity or very little desire for people in the IE area to be exposed to ways of life that differ from their own.

Figure 6-2 shows the aspirations and confidence to adapt index by poverty status. The asset poor (but not the income poor) are found to have lower aspirations and confidence to adapt than the non-asset poor. The lower aspirations and confidence of the poor, combined with scarce assets, are powerful factors that can undermine their ability to escape poverty.

**Figure 6-2. Aspirations and Confidence to Adapt Index, by Poverty Status**



\* Indicates significantly different at the 0.05 level.

### **Qualitative Data on Aspirations and Confidence to Adapt**

The mix of empowerment and fatalism among respondents is characterized by the responses of FG respondents in Jijiga: “When we save and migrate, it helps us to pass the bad times in a good way. About the future only Allah knows, not us . . . . A person who works hard in his farm and protects his farm from flood will get good income, but if a person doesn’t do so he/she will always beg to eat.” Conversely, a female FG participant in Jijiga explained that people believe that “Shocks come as per Allah’s will,” and male FG members stated that their religion tells them Allah dictates rainfall and other natural phenomena.

**Belief in individual power to enact change.** The stronger belief in individual power to enact change in Borena than Jijiga is reflected by Borena male FGD participants, who identified ways in which they have adapted to changes in their environment, including:

- Developing water wells and ponds during the rainy season in response to unexpected droughts.

- Reserving pasture for dry periods to counteract the effects of drought. As a result of reserving pasture, people have minimized their frequency of movement and thus controlled the intertribal conflict that results from the movement.
- Seeking out health posts and health centers in case of epidemics or sickness.
- Constructing latrines because of contagious diseases, including water borne diseases.
- Managing inter-tribal conflict through peaceful discussions by local governments. The FG members stated there is communication among their administrators and community members in order to avoid clashes between tribes.
- To avert the impact of brokers, the community started to educate their children in order to empower them to get involved in cattle trading.

Male FGD participants in Borena (Miyo *woreda*) also report learning about the importance of taking care of important natural resources. For instance, more efficient and effective management of pasture, hay, crop residue, grains, and other inputs necessary for livestock is described as an important innovation in response to changing conditions. The men also note that they are involved in natural resource conservation activities such as planting trees in areas highly damaged by drought. They want to protect their soils from erosion and increase the water table; they received training from NGOs and government organizations to do this.

Other male FG respondents in Borena (Surupa *kebele*) said that they had learned the importance of self-reliance and solving community problems on their own. They stated that necessary changes in livelihoods within the community should be initiated by the members. They have come to an understanding that they can be more effective through team work. Through their teams, they clear bush, have constructed a road and houses, farm together, and undertake other activities that help them accomplish tasks on time.

In another Borena *kebele*, male FG respondents have reportedly learned the benefit of selling cattle before the drought comes so that they can save the money before losing them all. They stated that, “We need awareness in this regard.”

The lower level of belief in individual power to enact change in Jijiga was also reflected in FGDs. With respect to resilience in the face of drought and flood, women in Jijiga claimed that “We don’t do anything except pray to get Allah’s mercy.” They said that there is no community action because the elders think the community does not have power to change the situation within its capacity. Female FG participants in Jijiga stated that they expect the government to help them when shocks (drought, flood) occur. When asked about their ability to manage shocks, men in Jijiga claimed they needed government and other projects mainly to organize enterprises at the micro level, such as grinding mills and petty trade.

Some of the male FG participants in Jijiga reflected their disappointment toward external assistance in coping with food and livelihood security shocks. They stated, “Another NGO came and asked our problem by promising to bring some change, but they disappeared, so we don’t believe that Mercy Corps or you are going to bring us anything. A proverb is mentioned for this complaint and it

says, ‘A mother lost her child and when the other child feels sick, she said I think this one is also going to die again.’”

**Aspirations.** When asked about aspirations, female FG participants in Borena said that “the future is in the hands of God.” However, the actions of community members, as discussed in the qualitative survey, show a strong set of aspirations. The aspirations of the women in Borena were revealed by discussions about their belief that their livelihoods will improve if their village gets access to electric power, piped water and schools. They stated that those who have money, those who can trade and those who have skills to do other jobs can survive well during hard times. One community claimed that their quest for secure livelihoods greatly improved with the construction of a road, which improved market access and reduced travel time to the market.

The female FG participants in Borena also want knowledge about saving and small business, and believe they can be more successful in managing shocks if they get job opportunities so that they can diversify their livelihoods. They aspire to follow in the footsteps of those near roads who own small shops or engage in animal fattening. Acquiring skills is a central element of their aspiration for diversified livelihoods, for which they say they need support from NGOs or government.

Other female FGs in Borena stated that they wanted someone to teach them about livestock and “safety net programs” (e.g., cash transfers and associated micro-finance services). The women believe that they can improve their livelihoods if they engage in trade and take part in these programs. To date, they have been very reluctant to undertake diversified livelihood activities, as they believe they do not have knowledge about trade, savings, and social interaction. They remain very dependent on their husbands, but they have the hope that things will be better if they get continuous support on how to get organized and learn different skills to cope.

Male FGD participants in Borena say they desire to sell animals when they are healthy and put the proceeds in savings. Some male FGD participants in Dembe Gaya *kebele* have recently started to fatten and sell bulls to earn more income. With their savings, they would pay for medical expenses and purchase food. They also said education was a critical tool for alleviating poverty in the community and pointed out that most of the elders (who are decision makers in the community) are not educated. The men also claimed that they desire to build houses in urban centers so that they have assets to turn to if/when there is a shock (drought) as often houses can be rented. FGD participants throughout Borena reported being increasingly interested in living in urban settlements; they have started building houses in urban areas, are saving money in banks, and are undertaking farming and apiculture.<sup>60</sup>

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<sup>60</sup> Beekeeping.

## 6.3 Social Capital

Social capital can be described as the quantity and quality of social resources (e.g., networks, membership in groups, social relations, and access to wider institutions in society) upon which people draw in pursuit of livelihoods.<sup>61</sup> Though it may encapsulate political institutions, social capital is broader than political capital because it includes informal social processes at individual, household, and community levels. Social capital has often been described as the “glue” that binds people in society together. It is based on strong perceptions of local embeddedness, self-regulating moral codes, and the norms, reciprocity and trust that exist between individuals and groups at the community level.<sup>62</sup> Close interaction between people through tight-knit communities, the ability to rely on others in times of crisis, and open communication between stakeholder groups are all generally seen as signs of well-developed social capital.

Three types of social capital enhance resilience:<sup>63</sup>

- **Bonding social capital** is seen in the bonds between community members. It involves principles and norms such as trust, reciprocity, and cooperation, and is often drawn on in the disaster context, where survivors work closely to help each other to cope and recover.
- **Bridging social capital** connects members of one community or group to other communities/groups. It often crosses ethnic/racial lines, geographic boundaries, and language groups, and can facilitate links to external assets and broader social and economic identities. Bridging social capital makes a direct contribution to community resilience in that those with social ties outside their immediate community can draw on these links when local resources are insufficient or unavailable (Wetterberg, 2004).
- **Linking social capital** is seen in trusted social networks between individuals and groups interacting across explicit, institutionalized, and formal boundaries in society. Linked networks are particularly important for economic development and resilience because they provide resources and information that are otherwise unavailable. This type of social capital is often conceived of as a vertical link between a network and some form of authority or power in the social sphere.

Communities with higher levels of bonding, bridging, and linking social capital are inherently more resilient than those with only one type or none.<sup>64</sup>

This section starts by presenting data from the PRIME baseline quantitative and qualitative surveys on the sources and types of social support households received in the previous year. Next, it presents measures of bonding, bridging, and linking social capital that will be used in the measurement of resilience in Section 6.9 below.

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<sup>61</sup> Frankenberger et al. (2013), Frankenberger and Garrett (1998).

<sup>62</sup> Chaskin (2008).

<sup>63</sup> Aldrich (2012).

<sup>64</sup> Aldrich (2012); Elliott, J. R., Haney, T., and Sams-Abiodun, P. (2010); Woolcock and Narayan (2000).

### Formal, Informal, and Capacity Building Social Support

Table 6-4 reports data on formal, informal, and capacity building social support received by households in the previous year. Informal support (i.e., support from relatives, neighbors, or friends) was received by 43.8 percent of households, mainly in the form of loans, gifts (*Quaadhan*), and remittances. Far less (27.3 percent) received formal social support. The key sources of informal support are the government and NGOs; the main types of support received were food rations and food-for-work or cash-for-work. Among those receiving formal support, nearly two-thirds received food rations, and 58.2 percent received food-for-work or cash-for-work.

**Table 6-4. Formal and Informal Sources of Social Support Received in the Last Year**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
<b>Received formal support (% of households)</b>	<b>27.3</b>	<b>33.6<sup>a</sup></b>	<b>11.5<sup>a</sup></b>	<b>31.4<sup>ab</sup></b>	<b>25.7<sup>a</sup></b>	<b>24.2<sup>b</sup></b>	<b>28.6</b>	<b>24.3</b>
<b>Sources of formal support<sup>cd</sup></b>								
Government	57.7	58.0	56.2	59.6	58.8	52.3	59.5	53.1
NGOs	57.2	55.7 <sup>a</sup>	68.9 <sup>a</sup>	59.0	54.4	59.2	55.4	62.1
Religious organization	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	1.1	1.3	0.0	0.7	0.4	3.3	1.4	0.4
<b>Types of formal support received<sup>cd</sup></b>								
Food ration	65.2	63.0 <sup>a</sup>	81.4 <sup>a</sup>	68.1	64.9	60.2	65.0	65.9
Food-for-work/Cash-for-work	58.2	60.7 <sup>a</sup>	40.0 <sup>a</sup>	64.3 <sup>a</sup>	56.7	49.4 <sup>a</sup>	57.7	59.5
Housing materials	0.8	0.8	1.1	1.3	0.8	0.0	0.9	0.5
Installed water points	0.4	0.3	1.5	0.3	0.1 <sup>a</sup>	1.1 <sup>a</sup>	0.1 <sup>a</sup>	1.3 <sup>a</sup>
Install latrine	0.5	0.6	0.0	0.9	0.4	0.0	0.7	0.0
School for children	1.0	0.3 <sup>a</sup>	5.6 <sup>a</sup>	0.4	1.6	0.8	0.5 <sup>a</sup>	2.3 <sup>a</sup>
Cash transfer	2.8	3.1 <sup>a</sup>	0.5 <sup>a</sup>	3.3	2.0	3.3	2.9	2.4
Other	3.0	3.2	1.5	2.8	1.9	5.5	2.9	3.3
<b>Received informal support (% of households)</b>	<b>43.8</b>	<b>51.3<sup>a</sup></b>	<b>25.1<sup>a</sup></b>	<b>51.2<sup>a</sup></b>	<b>36.7<sup>ab</sup></b>	<b>45.5<sup>b</sup></b>	<b>45.3<sup>a</sup></b>	<b>40.5<sup>a</sup></b>
<b>Types of informal support received<sup>cd</sup></b>								
Zakat	6.6	0.5 <sup>a</sup>	37.8 <sup>a</sup>	2.7 <sup>a</sup>	7.3 <sup>a</sup>	11.9 <sup>a</sup>	4.8 <sup>a</sup>	11.1 <sup>a</sup>
Remittances	24.3	28.0 <sup>a</sup>	5.6 <sup>a</sup>	30.2 <sup>a</sup>	17.0 <sup>ab</sup>	25.0 <sup>b</sup>	25.7	20.9
Gifts ( <i>Quaadhan</i> )	48.7	49.3	45.8	44.7	52.5	50.0	48.9	48.3
Loans	56.1	61.2 <sup>a</sup>	30.2 <sup>a</sup>	60.8 <sup>a</sup>	59.2 <sup>b</sup>	44.0 <sup>ab</sup>	58.0	51.3
<i>Xoolo goony</i>	7.0	4.0 <sup>a</sup>	22.7 <sup>a</sup>	6.7	6.6	8.3	5.7 <sup>a</sup>	10.4 <sup>a</sup>
<i>Sadaga</i>	3.7	0.2 <sup>a</sup>	21.7 <sup>a</sup>	1.0 <sup>ab</sup>	5.4 <sup>a</sup>	5.8 <sup>b</sup>	2.6 <sup>a</sup>	6.6 <sup>a</sup>
Other	0.8	0.7	0.9	0.3	1.0	1.0	0.6	1.3

Continued

Received capacity building support (% of households)	41.4	54.6 <sup>a</sup>	7.3 <sup>a</sup>	48.9 <sup>a</sup>	43.7 <sup>b</sup>	26.1 <sup>ab</sup>	45.0 <sup>a</sup>	33.0 <sup>a</sup>
<b>Sources of capacity building support<sup>c/</sup></b>								
Government	96.9	97.7 <sup>a</sup>	80.6 <sup>a</sup>	98.0 <sup>a</sup>	97.4 <sup>b</sup>	92.0 <sup>ab</sup>	97.1	96.0
NGO	26.1	25.7	34.2	28.8	22.0	31.0	26.8	24.1
Private sector	1.6	1.6	2.3	1.6	1.9	0.8	2.0 <sup>a</sup>	0.3 <sup>a</sup>
<b>Types of capacity building support received<sup>c/</sup></b>								
Vocational training	10.8	14.6 <sup>a</sup>	1.2 <sup>a</sup>	12.3 <sup>a</sup>	11.8 <sup>b</sup>	7.1 <sup>ab</sup>	11.7	8.7
Business development training	10.0	13.4 <sup>a</sup>	1.4 <sup>a</sup>	14.7 <sup>a</sup>	9.4 <sup>a</sup>	4.3 <sup>a</sup>	11.2 <sup>a</sup>	7.3 <sup>a</sup>
Early warning training	12.9	17.8 <sup>a</sup>	0.6 <sup>a</sup>	17.5 <sup>a</sup>	12.8 <sup>a</sup>	6.2 <sup>a</sup>	14.4 <sup>a</sup>	9.5 <sup>a</sup>
NRM	34.3	46.7 <sup>a</sup>	3.0 <sup>a</sup>	42.1 <sup>a</sup>	35.8 <sup>a</sup>	20.3 <sup>a</sup>	38.2 <sup>a</sup>	25.3 <sup>a</sup>
Seed packets/starter packets	9.3	12.2 <sup>a</sup>	2.0 <sup>a</sup>	12.3 <sup>a</sup>	9.6 <sup>b</sup>	4.4 <sup>ab</sup>	9.9	8.0
Adult education	9.7	11.8 <sup>a</sup>	4.2 <sup>a</sup>	13.5 <sup>a</sup>	9.1 <sup>a</sup>	4.9 <sup>a</sup>	10.3	8.1
Mobile phone for marketing	1.9	2.5 <sup>a</sup>	0.4 <sup>a</sup>	2.6 <sup>a</sup>	2.1	0.4 <sup>a</sup>	2.1	1.4

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

<sup>c/</sup> Reported only for those households receiving the support.

Capacity building support is a form of social support that is an investment in the long-term economic well-being of households. In the year prior to the survey, 41.4 percent of households received capacity building support, mainly from the government but also from NGOs. The most common type of capacity building support was NRM training. Other types included early warning training, vocational training, and business development training.

A far higher percentage of households in Borena received social support of all kinds than in Jijiga. There were also strong differences in the types of formal and informal support. With respect to formal support, Jijiga households were more likely to receive food rations, but Borena households were more likely to receive support in the form of food-for-work or cash-for-work. Borena households receiving informal support were more likely to receive it in the form of remittances and loans.

Note that the government has limited capacity to provide capacity building support, especially in the Somali Region where the Jijiga IE area is located. This is because the PSNP is implemented in only 30 *woredas* in the Somali Region, and complementary programming to PSNP is available in only 10 *woredas*. One reason the PRIME project was designed was to address these capacity issues, so more capacity building support should be available over the next few years.

Pastoralists were more likely to receive all three forms of social support than agro- or non-pastoralists. There are significant differences in the types of informal support and capacity building support received. Pastoralists were more likely to receive remittances, and agro- and non-pastoralists were more likely to receive *zakat*, a Muslim religious obligation to make monetary contributions to

poor and destitute groups. Pastoralists and agro-pastoralists were more likely to receive informal support in the form of loans and all types of capacity building support than non-pastoralists.

### **Perspectives on Social Support from the Qualitative Data Collection**

Both male and female focus groups in Jijiga and Borena discussed the informal social support systems that exist within communities to respond to emergencies and to help poor households under stress. The exact nature of social support varies from village to village. For example, consistent with the data presented in Table 6-4, gifts are more common than loans in Jijiga. Women in one *kebele* usually do not share food except in the event of a conflict. They explained that if someone loses a house as a result of a flood, the community members help him rebuild his house and/or give wood, household goods, grains, and money as a “gift.” Community members also support one another by sharing labor, cattle, and/or plow. Women in a different *kebele* in Jijiga say that they give cereals and seed to their neighbors in a time of need. If they are unable to support neighbors with food, they may contribute labor, loan cattle, or help build houses. As explained by one female FG participant, “We don’t give money to each other because we don’t have it at hand. In Somalia culture, it’s a shame to have cloth on your body while your neighbor doesn’t have one. We have a culture of *gergera* (helping each other).”

FG participants also said that there was strong community belief in helping those who have little; priority is given to those who have the least or have the biggest problem. They explained that the elders and the disabled come first in the culture, followed by religious and community leaders. They do not work to solve problems based on family and clan level; rather, they try to solve problems as a community: “Community leaders and elders advise us and make us help each other at the time of shocks. They tell us to give half of what we have to the one who is in need and to do things together as a group when the time is bad.”

Female and male FG respondents in Jijiga explained that families with no oxen and no ability to plow (elderly, sick, orphans) are often assisted by other community members. This may be giving food, seeds, plowing their land for them, or loaning them a cow so that they can consume milk (for children). Giving goats as gifts/support has reportedly decreased in recent years because so many goats are being killed by predators.

*“If your neighbor doesn’t have a cow to be milked, you have a responsibility to give one for him from yours. For example, I didn’t grow that much this year so I went to my neighbors and told them I couldn’t survive the summer with the food I have. So they gave me food and seed to grow for the next winter.”*

–Female FGD participant in Jijiga

Communities in Jijiga practice two forms of collective action (informal social support) in the event of flood and/or drought, as explained by male FG participants. The two community institutions mentioned were *Guss* and *Hologoin*. *Guss* is an association to help each other in the time of drought and flood. Members will go to the stricken household and provide services such as plowing and sowing. They also provide the family with pasture, grains, and a milking cow or goat. *Guss* is

designed to help households whose agricultural and/or livestock production has suffered as a result of the shock. *Hologoin* is a similar institution but is focused exclusively on helping the poorest community members, including those without livestock or agricultural land. Under *Hologoin*, milking cows and goats are provided mostly to support household nutrition; the person will return the animals after milking them for one year. Some male FGD participants said they engaged in *dabo* (labor exchange) among community members. They also offer labor support for farming, house construction, and other activities to weaker segments of the community, such as the elderly or ill. If necessary, needy households can ask elders and clan leaders for help in addressing problems.

In Borena, communities use several different forms of traditional social support. Male FGD participants in Dembe Gaya *kebele* (Teltele *woreda*) gave the following descriptions of some of the more prominent forms of informal social protection in their communities:

- *Busa Gonofa*: Providing cattle, money, milk, and the like to needy members of the community.
- *Hamessa*: A support by which individuals who have no lactating animals request milk from the community. Friends, relatives, or clan members give a lactating animal to use for milk. Ownership rights stay with the owner, and the user cannot sell or slaughter the animal.
- *Jila*: A child-naming ceremony during which the parents will invite their relatives, neighbors, and clan members to obtain naming rights through contributions of money, goat, sheep, and cattle.
- *Siqe*: A cultural kinship-based support mechanism for newlyweds in which the bride's extended family members give cattle or other animals.

Sources of formal support were also discussed by male and female FG participants, who were generally more critical of government services than of NGO assistance. Respondents say the government promotes a self-help system called Five to One networks in many remote, vulnerable communities. It is promoted as a model for self-help whereby the same group of five households engages in collective, mutually beneficial activities, such as digging pit latrines, tending common agricultural plots, and building houses. FG participants felt that the system was not effective, however. Participants also discussed another government program whereby 20 to 30 households form a group with one leader who is responsible for conveying emergency information about health and livestock. Participants also deemed this program ineffective due to lack of motivation on the part of the leaders as they must travel long distances to pass the information on yet are not compensated.

Male FG participants in Jijiga acknowledge government support to address shocks, yet they also believe that government interventions are “weak and inadequate” and offer no help in recovery or rehabilitation. One participant said that “They always ask about the problems of this community but they don’t do anything.” They stated that there used to be formal social safety net programs, but the limited coverage of such external programs occasionally caused conflict within the community.

Currently, food insecurity among destitute families is also tackled through PSNP and SOS Sahel Ethiopia. Communities make formal requests for assistance to *woreda* governments through their *kebele*-level administration. The *woreda* administration then forwards their requests to NGOs. AFD, ACCORD, CARE, Goal and Action Fame have subsequently offered support through community water distribution during the recent drought. Multiple FGDs in Borena noted that while social protection programs through government and NGOs were available in some communities, they were not accessible to all vulnerable households that could benefit from them.

The FG participants mentioned many types of NGO assistance. Mercy Corps has helped in preventing flood and increasing productivity through construction of terracing and check dams, planting grass to stabilize slopes and pasture, providing water pumps, and offering cash-for-work opportunities. CARE has provided drought-affected communities with food assistance, and the Oromo Self-Help Organization has provided food and livestock for recovery. Other local NGOs (e.g., Goyo) have helped communities in Borena construct water catchments for the dry season and to construct fodder banks. Some reported that Oromo Self-Help Organization and AFD helped “restock” goats in the wake of drought but the animals were not suited to the local environment and have since died of disease. SOS Sahel Ethiopia has also reportedly distributed livestock to particularly needy families in Borena. Goal Ethiopia is also giving support on mothers and child health service.

### **Indexes of Bonding, Bridging, and Linking Social Capital**

Having good overall measures of the strength of social capital is important for understanding its distribution across populations and how it changes over time, but also for measuring resilience (see Section 6.8). For these purposes, the PRIME IE baseline data are used to construct indexes of bonding, bridging, and linking social capital, as detailed in Appendix 1. The index of bonding social capital measures whether a household can rely on other members of their community when in need, and feels that if another community member needed them they could help out. The index of bridging social capital measures the same, but in reference to households residing *outside* of their community. The index of linking social capital is based on indicators of people’s ability to form vertical linkages with sources of power and authority outside of their community. These indicators are 1) having received information from extension agents or government officials and 2) the quality of services provided in a households’ community (roads, health services, veterinary services, and agricultural extension services). Higher-quality services is an indication that community members have been able to draw on their relations with people in power to improve their lives.

The means of the indexes by IE area, pastoralist status, and PRIME intervention group are reported in Table 6-5. Bonding, bridging, and linking social capital are all much stronger in Borena than in Jijiga. They are also stronger among pastoralists than agro- and non-pastoralists. Agro-pastoralists tend to have stronger social capital than non-pastoralists, although the strength of linking social capital is roughly equal for these two groups.

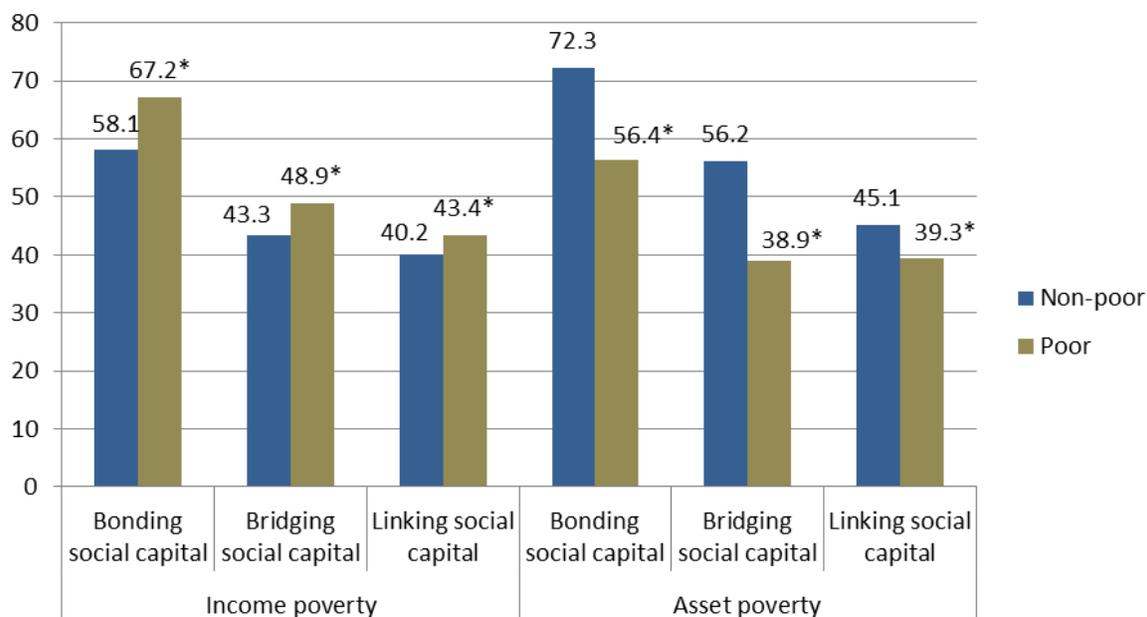
Figure 6-3 presents the social capital indexes by poverty status. Income-poor households have slightly stronger social capital than non-income-poor households. In contrast, the asset poor have substantially lower social capital than the non-asset poor. This difference is especially pronounced for bonding and linking social capital. The causation may be two-way. Households owning more assets may be able to leverage more social support; conversely, those with more social support may be better able to accumulate assets and protect the assets that they own.

**Table 6-5. Indexes of Bonding, Bridging, and Linking Social Capital**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
Bonding social capital (mean)	63.1	71.2 <sup>a</sup>	43.1 <sup>a</sup>	70.4 <sup>a</sup>	63.3 <sup>a</sup>	52.2 <sup>a</sup>	64.0	61.1
Bridging social capital (mean)	46.4	53.0 <sup>a</sup>	29.8 <sup>a</sup>	55.2 <sup>a</sup>	45.4 <sup>a</sup>	35.2 <sup>a</sup>	47.7	43.4
Linking social capital (mean)	41.9	45.8 <sup>a</sup>	32.2 <sup>a</sup>	45.9 <sup>ab</sup>	40.0 <sup>a</sup>	39.5 <sup>b</sup>	42.1	41.5

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

**Figure 6-3. Indexes of Bonding, Bridging, and Linking Social Capital, by Poverty Status**



\* Indicates significantly different at the 0.05 level.

## 6.4 Livelihood Diversification

Diversity of livelihood sources is important for resilience because it can allow flexibility, reducing households' vulnerability in the face of shocks. Here, diversity is measured as the total number of livelihood activities each household is engaged in (see Table 3-4 for a list of the activities). The number of livelihood activities is higher for Borena than Jijiga, 2.2 versus 1.7 (Table 6-6). Agro-pastoralists have a greater diversity of livelihood activities than pastoralists, and non-pastoralists have the least diversity. Overall, the diversity is quite low, which can be explained in part by FG comments about lack of access to roads, transportation, markets, skills training, and other types of capacity building support described in Section 6.3.

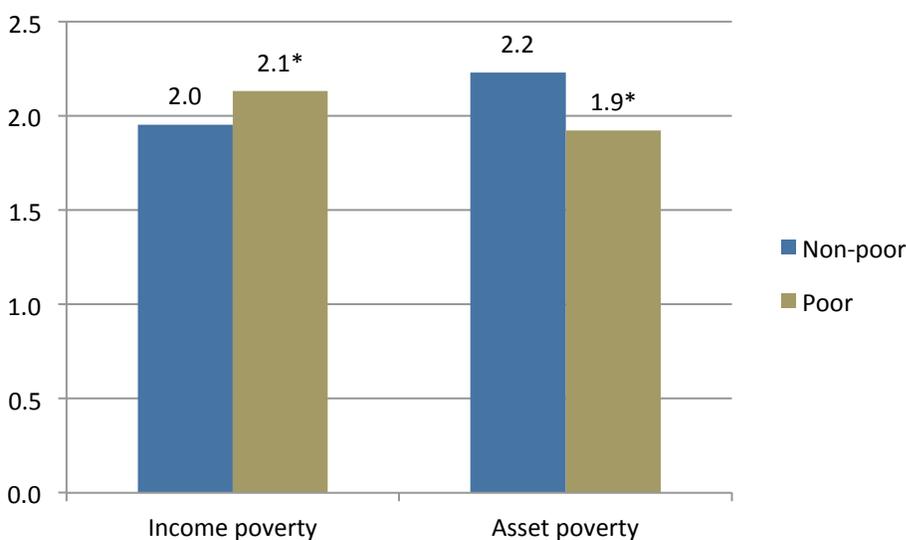
**Table 6-6. Diversity of Livelihood Sources**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
Number of livelihood activities	2.1	2.2 <sup>a</sup>	1.7 <sup>a</sup>	2.0 <sup>a</sup>	2.3 <sup>a</sup>	1.7 <sup>a</sup>	2.1 <sup>a</sup>	1.9 <sup>a</sup>

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

Figure 6-4 shows the diversity of livelihood sources by poverty status. Here again, we see that there is a stronger association between livelihood diversity and poverty when poverty is measured using asset ownership than total expenditures. The asset poor have lower livelihood diversity than the asset non-poor. There is very little difference in livelihood diversity between the income poor and income non-poor.

**Figure 6-4. Diversity of Livelihood Sources, by Poverty Status**



\* Indicates significantly different at the 0.05 level.

## Perspectives from the Qualitative Data

FGDs relevant to livelihood diversification provide some information about women’s contribution to such diversification. FG participants in Borena said women who lived near roads could engage in petty trade—opening small shops, selling food, local beer (*tela*), and *chat* (though these last two practices are strongly discouraged by traditional leaders).

Women in Teltele *kebele* in Borena have started raising chickens, which are the only property they have full authority over without involvement of their husbands. Those from Dida Hara *kebele* suggest that widows tend to be more “prosperous” because they have more freedom to engage in livelihood activities and sometimes qualify for targeted support. In one community, the identified positive deviant was a widow. She explained that the culture makes women dependent on men, but when widowed, women are forced to work hard and exercise their own initiative. An example of a positive change for widowed women is that they can sell livestock, while married women cannot because they do not have the authority to make household decisions.

*“You can bring what the community needs from town and get profit if you are a trader, but farming doesn’t work during droughts.”*

–“Positive deviant” in Jijiga on the importance of livelihood diversification

Male FG participants in Jijiga (Gursum) claim that women’s empowerment has increased in recent years. “Before there was no education but now a few educated women from this community have got civil service jobs at the *woreda* and are engaged in party and administration. Here they are part of the Parent and Teacher Association, they have their own association; they are council members at the *kebele* and at *woreda* levels.” While some FG participants state that there is a clear division of labor along gender lines, at least one community in Jijiga claims that there is no gender difference in farming and other activities in their village because “we women even dig and farm in the land and when we travel for trade and other purposes, our husbands take care of the kids and the house.”

## 6.5 Ownership of Productive Assets and Access to Financial Resources

Productive and financial assets can be used by households to increase income and to buffer themselves against shocks. They are thus important components of households’ resilience to shocks. Table 6-7 gives the percent of households owning various agricultural productive assets and the mean of a “productive asset index.” This index is the total number of the assets owned.<sup>65</sup> The table also reports an indicator of ownership of animals (in TLUs, defined in Section 3.5), which are an important productive asset in this pastoral area.<sup>66</sup>

<sup>65</sup> Note that three groups of assets are grouped together before calculating the index: traditional beehive and modern beehive, mechanical water pump and motorized water pump, and stone grain mill and motorized grain mill.

<sup>66</sup> See Table 3.6 for animal ownership broken down by type of animal.

**Table 6-7. Ownership of Productive Assets**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
<b>Agricultural productive assets (% households owning)</b>								
Plow yoke	66.6	70.0 <sup>a</sup>	58.3 <sup>a</sup>	66.7 <sup>a</sup>	78.0 <sup>a</sup>	46.0 <sup>a</sup>	69.0 <sup>a</sup>	60.9 <sup>a</sup>
Plow beam	64.4	69.9 <sup>a</sup>	51.0 <sup>a</sup>	65.7 <sup>a</sup>	76.8 <sup>a</sup>	40.5 <sup>a</sup>	67.2 <sup>a</sup>	58.1 <sup>a</sup>
Plow lever	64.3	70.2 <sup>a</sup>	49.7 <sup>a</sup>	65.6 <sup>a</sup>	76.8 <sup>a</sup>	40.1 <sup>a</sup>	67.4 <sup>a</sup>	57.4 <sup>a</sup>
Pair of plough blade	63.7	69.8 <sup>a</sup>	48.5 <sup>a</sup>	65.1 <sup>a</sup>	76.0 <sup>a</sup>	39.6 <sup>a</sup>	66.3 <sup>a</sup>	57.7 <sup>a</sup>
Leather tie for plough	59.7	65.2 <sup>a</sup>	46.0 <sup>a</sup>	59.6 <sup>a</sup>	71.9 <sup>a</sup>	38.1 <sup>a</sup>	62.3 <sup>a</sup>	53.8 <sup>a</sup>
Metal-plough	58.5	66.5 <sup>a</sup>	38.7 <sup>a</sup>	61.2 <sup>a</sup>	69.7 <sup>a</sup>	34.4 <sup>a</sup>	61.3 <sup>a</sup>	52.2 <sup>a</sup>
Sickle	56.3	57.3	54.0	52.7 <sup>a</sup>	68.4 <sup>a</sup>	40.3 <sup>a</sup>	58.0	52.6
Pick axe	45.3	47.4 <sup>a</sup>	40.2 <sup>a</sup>	47.1 <sup>a</sup>	50.4 <sup>b</sup>	33.6 <sup>ab</sup>	46.0	43.8
Axe	76.3	83.6 <sup>a</sup>	58.2 <sup>a</sup>	82.1 <sup>a</sup>	79.2 <sup>b</sup>	62.3 <sup>ab</sup>	78.0 <sup>a</sup>	72.4 <sup>a</sup>
Pruning/cutting shears	7.6	5.0 <sup>a</sup>	14.1 <sup>a</sup>	5.2 <sup>ab</sup>	8.4 <sup>a</sup>	9.8 <sup>a</sup>	7.1	8.8
Hoe	42.5	46.0 <sup>a</sup>	33.9 <sup>a</sup>	43.6 <sup>a</sup>	46.8 <sup>b</sup>	33.3 <sup>ab</sup>	43.4	40.5
Spade or shovel	43.0	46.8 <sup>a</sup>	33.5 <sup>a</sup>	47.7 <sup>a</sup>	46.1 <sup>b</sup>	30.4 <sup>ab</sup>	43.3	42.3
Whip (leather)	45.6	57.7 <sup>a</sup>	15.8 <sup>a</sup>	50.0 <sup>a</sup>	53.9 <sup>b</sup>	24.4 <sup>ab</sup>	49.7 <sup>a</sup>	36.3 <sup>a</sup>
Traditional beehive	13.4	17.2 <sup>a</sup>	4.2 <sup>a</sup>	15.6 <sup>a</sup>	14.9 <sup>b</sup>	7.7 <sup>ab</sup>	13.2	14.1
Modern beehive	1.1	0.9	1.4	0.7	1.2	1.3	1.1	1.1
Knapsack chemical sprayer	1.5	1.7	1.2	1.1	1.7	2.0	1.8	1.1
Mechanical water pump	0.6	0.6	0.7	0.4	0.6	1.0	0.8	0.2
Motorized water pump	0.6	0.5	1.1	0.2 <sup>a</sup>	0.7	1.1 <sup>a</sup>	0.7	0.5
Stone grain mill	19.1	16.6 <sup>a</sup>	25.4 <sup>a</sup>	14.7 <sup>a</sup>	23.1 <sup>a</sup>	18.7	18.7	20.1
Motorized grain mill	0.8	0.6	1.0	0.4	1.2	0.5	0.9	0.3
Broad bed maker	2.4	2.6	1.9	1.7	3.1	2.2	2.2	2.9
Small tractor	0.4	0.2 <sup>a</sup>	0.8 <sup>a</sup>	0.0 <sup>ab</sup>	0.5 <sup>a</sup>	0.8 <sup>b</sup>	0.4	0.3
Hand-held motorized tiller	2.3	2.5	1.8	1.2 <sup>a</sup>	3.5 <sup>a</sup>	1.9	2.3	2.4
<b>Index of agricultural productive assets<sup>c/</sup></b>	<b>8.1</b>	<b>8.7<sup>a</sup></b>	<b>6.7<sup>a</sup></b>	<b>8.2<sup>a</sup></b>	<b>9.4<sup>a</sup></b>	<b>5.7<sup>a</sup></b>	<b>8.4<sup>a</sup></b>	<b>7.6<sup>a</sup></b>
<b>Animals (TLUs owned)<sup>d/</sup></b>	<b>6.4</b>	<b>7.3<sup>a</sup></b>	<b>4.3<sup>a</sup></b>	<b>10.1<sup>a</sup></b>	<b>5.5<sup>a</sup></b>	<b>2.5<sup>a</sup></b>	<b>6.3</b>	<b>6.7</b>

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

<sup>c/</sup> This index is the sum of assets owned with three sets grouped together into one category: Traditional beehive and modern beehive, Mechanical water pump and Motorized water pump, and Stone grain mill and motorized grain mill. The index ranges from 0 to 21.

<sup>d/</sup> Tropical livestock units (see Section 3.5).

### Ownership of Productive Assets

The most commonly owned agricultural productive assets are plow components, axes and sickles, which are basic farm implements. According to the ownership index, Borena households own more agricultural implements than Jijiga households. As would be expected, agro-pastoralists own more than pastoralists. Non-pastoralists own the fewest. Also as expected, pastoralists own more animals than the other two pastoralist status groups. Overall, the non-pastoralist group owns the fewest productive assets.

## Access to and Usage of Credit and Savings Support

Table 6-8 reports on access to and usage of credit and savings support. Overall, credit is far more accessible in Borena than in Jijiga. Credit from formal institutions is available to over half of the communities in Borena but to only 4 percent of communities in Jijiga. The most common sources of credit in Borena are community groups and friends or relatives, with relatively few NGO or other types of institutions. None of the communities in Jijiga has access to any credit institution other than a community group.

**Table 6-8. Access to and Usage of Credit and Savings Support**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
<b>Access to credit support</b>								
Percent of communities with institutions providing credit	33.2	52.5 <sup>a</sup>	4.1 <sup>a</sup>	-	-	-	31.6	39.3
Type of institutions								
Community group	27.7	43.4 <sup>a</sup>	4.1 <sup>a</sup>	-	-	-	24.8	39.3
Friends/Relatives	26.1	43.4 <sup>a</sup>	0.0 <sup>a</sup>	-	-	-	22.8	39.3
NGOs	8.1	13.4	0.0	-	-	-	9.1	3.9
Other	8.9	14.7 <sup>a</sup>	0.0 <sup>a</sup>	-	-	-	9.1	7.9
<b>Usage of credit support</b>								
Percent of households taking out a loan in the last year	44.6	53.2 <sup>a</sup>	23.0 <sup>a</sup>	52.5 <sup>a</sup>	43.1 <sup>a</sup>	35.6 <sup>a</sup>	46.7 <sup>a</sup>	39.9 <sup>a</sup>
Source of loans								
Money lender	3.5	3.2 <sup>a</sup>	11.4 <sup>a</sup>	2.7	4.5	3.1	3.0	4.9
Friend/neighbor	65.0	64.7	73.0	66.8	61.8	68.1	65.3	64.2
Family member	3.2	3.1	5.8	2.4	3.7	4.3	2.9	4.4
Micro credit	4.0	4.1	1.2	4.2	3.4	4.6	4.4	2.7
Savings group	21.3	22.1 <sup>a</sup>	0.0 <sup>a</sup>	21.2	24.3 <sup>a</sup>	14.7 <sup>a</sup>	21.7	20.1
Other	3.0	2.8 <sup>a</sup>	8.6 <sup>a</sup>	2.7	2.3	5.4	2.7	3.8
Hholds taking out a loan as a percent of those in need of one	57.5	72.0 <sup>a</sup>	26.6 <sup>a</sup>	69.2 <sup>a</sup>	54.7 <sup>a</sup>	45.8 <sup>a</sup>	61.2 <sup>a</sup>	49.6 <sup>a</sup>
Reasons given for not taking out a loan when needed one								
No loan that met my needs <sup>c/</sup>	8.4	8.1	8.7	7.7	11.0 <sup>a</sup>	5.2 <sup>a</sup>	9.6	6.4
Afraid I couldn't pay back	39.4	59.5 <sup>a</sup>	23.0 <sup>a</sup>	48.1 <sup>a</sup>	33.3 <sup>a</sup>	41.4	40.5	37.6
No loan providers in my area	51.3	31.1 <sup>a</sup>	67.7 <sup>a</sup>	43.6 <sup>a</sup>	55.0 <sup>a</sup>	51.9	48.7	55.4
Other	0.9	1.3	0.6	0.6	0.7	1.5	1.1	0.6
<b>Access to savings support</b>								
Percent of communities with a savings group	40.4	67.2 <sup>a</sup>	0.0 <sup>a</sup>	-	-	-	38.7	47.1
<b>Usage of savings support</b>								
Percent of hholds w cash savings	13.9	17.5 <sup>a</sup>	4.8 <sup>a</sup>	18.3 <sup>ab</sup>	12.3 <sup>a</sup>	10.3 <sup>b</sup>	14.1	13.5
Place where savings are held								
In cash at home	32.1	29.1	-	39.0	25.5	28.1	32.4	31.1
With savings group or micro-finance institution	58.7	61.2	-	51.6 <sup>a</sup>	73.0 <sup>ab</sup>	44.1 <sup>b</sup>	58.2	59.9
With bank	7.6	7.9	-	8.1 <sup>a</sup>	1.5 <sup>b</sup>	20.8 <sup>ab</sup>	7.1	8.9
Other	1.7	1.8	-	1.2	0.0	7.0	2.4	0.0

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns

<sup>c/</sup> I.e., is appropriate in terms of size, terms, sharia-compliant, etc.

Over half of households surveyed in Borena took out a loan in the year prior to the survey. Only about one in five households in Jijiga did so. In both areas, friends or neighbors were by far the primary source of loans. The second most common source of loans in Borena is savings groups, used by slightly over 20 percent of households (but used by no households in Jijiga). In Jijiga, moneylenders are the second most common source of loans, used by 11 percent of households. Virtually no households in Jijiga took loans from a microcredit or savings group, though it should be noted that some women's traditional group savings schemes provide a regular payout to members that is the result of pooled savings and may not be viewed as a loan.

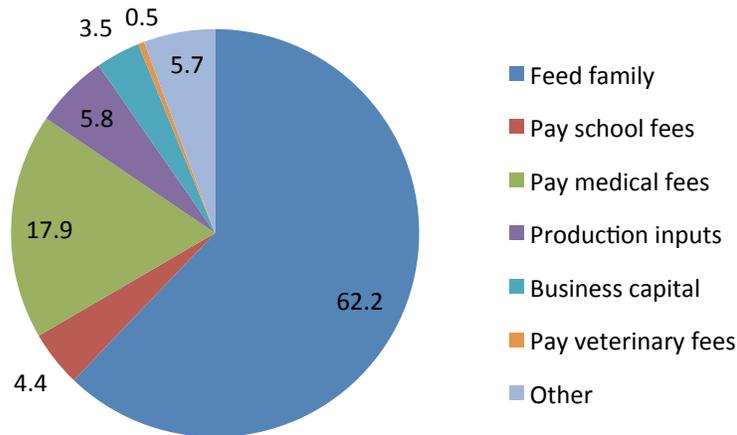
In the year preceding the survey, the percentage of households in Borena that needed a loan and subsequently took out a loan was three times higher than in Jijiga. More than half of the households in Borena that did not take a loan said they feared that they would not be able to repay the loan. The second most common reason, cited by almost one-third of households, was that there were no loan providers in the area. The reasons were the same in Jijiga, though the percentages are reversed: The majority of households did not take a loan due to the absence of loan providers, and the rest did not take a loan out of fear that they could not repay it.

Slightly over half of pastoralist households surveyed took out a loan in the year prior to the survey. This was a higher percentage than for agro- or non-pastoralist households, though a substantial minority of those groups also took loans. More than two-thirds of pastoralist households in need of a loan took out a loan, whereas about half of agro- and non-pastoralist households that needed a loan did so. In terms of why households did not take out a loan when they needed one, pastoralists were more likely than agro- or non-pastoralists to report that they were afraid they could not pay it back. Conversely, agro- and non-pastoralists were more likely to report that there are no loan providers in their area.

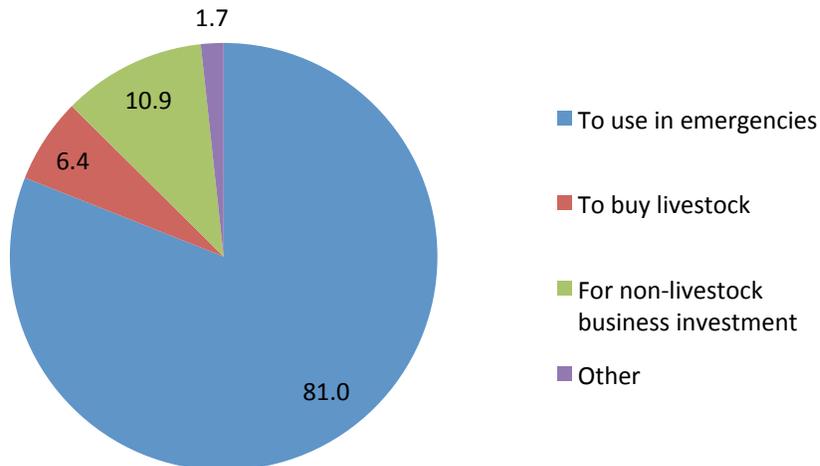
Access to savings support also shows a wide gap between Borena and Jijiga. In Borena, 67 percent of communities have a savings group. None of the surveyed communities in Jijiga has a savings group. The percentage of households with cash savings is low; less than one-fifth of households in Borena and one in 20 households in Jijiga report having cash savings. Of those that do have savings, a savings group or microfinance institution is the preferred repository. About one in five non-pastoralist households with savings report using a bank, though this is not a popular option because many communities do not have banks.

Figures 6-5 and 6-6 give a breakdown of the reported purposes for taking out loans and holding savings. By far, the majority of households take out loans for non-productive purposes. Purchasing food for the family is the most common reason, cited by nearly two-thirds of households. The second most common reason is to pay medical fees; about one out of six households used loans for this purpose. Other activities account for only 6 percent or less of the reasons households take out loans, including the purchase of production inputs, to pay school fees, and to obtain business capital.

**Figure 6-5. Reasons for Taking out Loans**



**Figure 6-6. Reasons for Holding Savings**



Of the few households that do have cash savings (Table 6-8), more than 80 percent reserve savings to use in emergencies. Though the ability to deal with emergencies is an important reason to hold savings, this result also indicates that the majority of households may lack the ability to direct savings toward productive activities. Only about 11 percent of households use savings for non-livestock business investment. About 6 percent use savings to purchase livestock.

In Jijiga, male FG participants report that leaders, during community meetings, stress the importance of saving at least a small portion of what people have produced. However, repeated droughts and floods severely affect household savings because production is always limited for one reason or another.

## 6.6 Access to Markets, Services, and Infrastructure

Access to markets, services, and infrastructure are important factors affecting households' resilience to shocks. Being elements of “transformative capacity” (see below), these factors enable more lasting, sustainable resilience.

### Access to Markets

Table 6-9 reports results from the household survey on access to markets for sales and purchases of livestock and agricultural products and inputs. Overall, local market towns are the most common “normal place” for sales and purchases. Sixty-two percent of households cite local market towns as the normal place for sale for livestock products, 75.4 percent for agricultural crops, and 82 percent for purchases of inputs. Locations of secondary importance are other villages and *woreda* towns.

Forty-five percent of households in the IE area indicated that they preferred to sell at a different market than the one they normally use. The most common reasons given for not selling at their preferred market were transportation costs and distance. A somewhat greater percent of households reported not being satisfied with their normal place of input purchases (53 percent). In addition to transport costs and distance, a substantial percentage of these households cited “unsure of prices in market” as a reason for not purchasing at their preferred market location.

Households in Jijiga show more diversity than those in Borena in the locations of the markets they use. As a group, households in Jijiga rely less on their local market town for product sales and input purchases. Another notable regional difference is that households in Borena that prefer to sell at a market other than the one that they normally use are more likely to cite “unsure of market prices” as a reason.

Pastoralists show the strongest reliance on a local market town for markets, followed by agro- and non-pastoralists. Pastoralists and agro-pastoralists are more likely than non-pastoralists to prefer to use a different market. Transport costs, distance, and “unsure of market prices” are all cited as common reasons for this. By contrast, non-pastoralists rarely cite lack of information on prices as a reason for not using a preferred market.

Male FG participants in multiple communities in Borena explained how the lack of road infrastructure limited their access to markets and their options for effectively marketing cattle. They reported that they sometimes had to walk two to three days to reach a market in a nearby town, which takes a substantial toll on their health.

The men also stressed that they were negatively affected by brokers when they sold their products: They sell for a low price and the traders resell the same product for a very high price. Some claim they are spurred to sell animals at a low price or “on credit” due to the fear of disease and/or drought, or the potential loss of cattle during the return trip (should they choose not to accept the low price).

**Table 6-9. Access to Markets**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
<b>Normal place of sale for livestock products (%)</b>								
This village	9.5	7.9 <sup>a</sup>	13.7 <sup>a</sup>	6.5 <sup>a</sup>	9.2 <sup>b</sup>	15.6 <sup>ab</sup>	9.4	9.7
Another village	11.3	10.8	12.6	12.4	11.5	9.0	13.0 <sup>a</sup>	7.6 <sup>a</sup>
Local market town	62.2	72.3 <sup>a</sup>	35.7 <sup>a</sup>	70.6 <sup>a</sup>	62.1 <sup>a</sup>	47.1 <sup>a</sup>	63.0	60.3
Woreda town	13.5	7.2 <sup>a</sup>	29.8 <sup>a</sup>	8.8 <sup>a</sup>	14.0 <sup>a</sup>	20.6 <sup>a</sup>	11.2 <sup>a</sup>	18.5 <sup>a</sup>
Other	3.6	1.8 <sup>a</sup>	8.1 <sup>a</sup>	1.7 <sup>a</sup>	3.2 <sup>a</sup>	7.7 <sup>a</sup>	3.4	3.9
<b>Normal place of sale for agricultural crops (%)</b>								
At farm	4.2	1.1 <sup>a</sup>	11.6 <sup>a</sup>	3.1 <sup>a</sup>	3.2 <sup>b</sup>	8.9 <sup>ab</sup>	2.6 <sup>a</sup>	7.9 <sup>a</sup>
In village	12.2	11.1	14.8	9.1 <sup>a</sup>	12.7	16.2 <sup>a</sup>	13.1	10.2
Local market	75.4	82.1 <sup>a</sup>	59.2 <sup>a</sup>	80.3 <sup>a</sup>	75.7 <sup>b</sup>	66.1 <sup>ab</sup>	76.0	74.0
Regional market	3.3	2.8	4.5	2.6	3.5	3.9	3.7	2.4
Other	4.9	2.8 <sup>a</sup>	9.9 <sup>a</sup>	4.9	5.0	4.8	4.7	5.4
<b>Percent preferring to sell at a different market</b>	<b>44.6</b>	<b>45.4</b>	<b>42.5</b>	<b>46.7<sup>a</sup></b>	<b>46.3<sup>b</sup></b>	<b>37.5<sup>ab</sup></b>	<b>45.6</b>	<b>42.4</b>
Reason for not selling at preferred market (%; multiple responses possible)								
Transport cost too high	28.4	21.8 <sup>a</sup>	46.6 <sup>a</sup>	28.6	26.0 <sup>a</sup>	33.9 <sup>a</sup>	27.3	31.0
Too long to reach market	53.4	55.2	48.3	48.2 <sup>a</sup>	57.9 <sup>a</sup>	53.0	53.0	54.3
Unsure of prices in market	18.1	22.0 <sup>a</sup>	7.4 <sup>a</sup>	21.0 <sup>a</sup>	19.2 <sup>b</sup>	9.3 <sup>ab</sup>	19.0	15.9
Other	4.6	2.4 <sup>a</sup>	11.0 <sup>a</sup>	3.4 <sup>a</sup>	4.3 <sup>b</sup>	8.1 <sup>ab</sup>	4.6	4.6
<b>Normal place for purchase of agricultural and livestock inputs (%)</b>								
At farm	3.9	1.4 <sup>a</sup>	11.5 <sup>a</sup>	1.4 <sup>a</sup>	4.0 <sup>a</sup>	9.9 <sup>a</sup>	3.0	6.0
Village shop	8.2	7.6	10.2	6.4	8.9	10.9	8.6	7.5
Local market	82.4	86.3 <sup>a</sup>	70.6 <sup>a</sup>	87.0 <sup>a</sup>	81.0 <sup>b</sup>	75.3 <sup>ab</sup>	82.5	82.3
Regional market	3.5	3.0	5.0	3.4	3.9	2.6	3.8	2.8
Other	1.9	1.7	2.7	1.9	2.3	1.3	2.2	1.4
<b>Percent preferring to purchase at a different market</b>	<b>53.1</b>	<b>54.7</b>	<b>48.2</b>	<b>56.3</b>	<b>52.1</b>	<b>47.9</b>	<b>55.0</b>	<b>49.0</b>
Reason for not purchasing at preferred market (%; multiple responses possible)								
Transport cost too high	29.1	26.9	37.0	33.3	23.9	32.2	29.3	28.4
Too long to reach market	41.2	40.3	44.4	35.3 <sup>a</sup>	44.0	50.3 <sup>a</sup>	39.8	44.6
Unsure of prices in market	25.7	31.1 <sup>a</sup>	6.5 <sup>a</sup>	27.3 <sup>a</sup>	29.1 <sup>b</sup>	11.2 <sup>ab</sup>	27.0	22.6
Other	4.0	1.7 <sup>a</sup>	12.1 <sup>a</sup>	4.1	3.0	6.4	3.8	4.4

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

Women also face barriers to obtaining fair market prices. Female FG participants in Jijiga say they have no access to market information such as livestock prices, and that physical access to livestock markets is a challenge. Even when the women do access markets, they are dependent on the terms of exchange set by brokers, who tell individual farmers or herders the price. If the seller agrees to the price, the broker gets 150-200 birr (about U.S. \$8-10) for each head of cattle sold.

*“We do not know about the price. The broker is the one who sold our product and gave us the money. We just stand beside the broker while he discusses the price with traders and the livestock (cattle) are sold.”*

–Female FGD participant in Borena

### Access to Animal Health Services

Table 6-10 presents information on access to animal health services from both the household and community surveys by PRIME IE area. Borena has considerably more basic animal health services than Jijiga. Neither has much access to veterinary stores that carry basic medicines or supplements. A majority of communities in Borena have animal health services, but those primarily provide vaccinations, and far fewer communities have established services for treatment of disease. In Jijiga, such services are largely absent from most communities. FG participants in both Borena and in Jijiga state that lack of high-quality health care for livestock is a major stress.

**Table 6-10. Access to Animal Health Services**

Indicator	All	Project Area	
		Borena	Jijiga
<b>Percent of households with animal services in their area (from HHS)</b>			
Vaccination, dipping inoculation	55.7	61.0 <sup>a</sup>	42.9 <sup>a</sup>
Treatment for diseases	49.2	57.7 <sup>a</sup>	28.4 <sup>a</sup>
Animal de-worming	26.5	35.0 <sup>a</sup>	5.6 <sup>a</sup>
Breeding services	0.8	0.9	0.8
Commercial feed supply	0.9	1.2 <sup>a</sup>	0.2 <sup>a</sup>
Veterinary store with vaccines	10.4	11.5 <sup>a</sup>	7.6 <sup>a</sup>
Veterinary store with de-worming supplies	6.6	9.1 <sup>a</sup>	0.5 <sup>a</sup>
Veterinary store with antibiotics	6.6	8.2 <sup>a</sup>	2.6 <sup>a</sup>
Veterinary store with salt licks/mineral supplements	3.4	4.4 <sup>a</sup>	1.0 <sup>a</sup>
Other	5.5	1.6 <sup>a</sup>	15.3 <sup>a</sup>
<b>Percent of communities with animal services (from community survey)</b>			
Livestock vaccinations	50.7	70.2 <sup>a</sup>	21.3 <sup>a</sup>
Livestock antibiotics	37.8	58.5 <sup>a</sup>	6.6 <sup>a</sup>
De-worming	33.4	55.5 <sup>a</sup>	0.0 <sup>a</sup>
Dipping inoculation	4.4	7.4	0.0
Other treatment for diseases	38.5	49.8 <sup>a</sup>	21.3 <sup>a</sup>
Supplemental feeding	4.0	6.6 <sup>a</sup>	0.0 <sup>a</sup>
Other	11.7	7.4	18.3

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

The importance of having access to animal health services is illuminated by the qualitative information collected on livestock disease. A number of devastating livestock diseases were recounted by FGD participants. For example, *keulude* is a parasite-transmitted disease that affects the lymph nodes. As a result, the skin, meat, and milk of such animals have no value as buyers refuse to purchase diseased animals.

Livestock diseases are the major cause of economic loss among pastoralist and agro-pastoralist households in Ethiopia, and are usually dealt with after outbreaks rather than through preventive measures. This is due in part to the remoteness of pastoralist and agro-pastoralist communities from animal health clinics, as well as the cost of vaccines and other medications (UNDP 2014). Distance from an animal health clinic was mentioned by FG participants in both Borena and Jijiga as a constraint to their access to animal health services. Other constraints are a lack of professional staff in the clinics (due to limited technical capacity and high turnover) and equipment. Many FGD participants said there was no medicine for most of the diseases their animals contracted and that repeated requests for assistance from NGOs or the government went unanswered. As a result, they often rely on traditional cures such as applying acid, salt (or other substances), or branding to abscesses.

FGD participants stated that even when medicines exist, they are simply beyond their ability to access them: They are unavailable and unaffordable. For example, it is expensive and complex to treat trypanosomiasis, a parasite that causes emaciation and death in animals, with drugs. The trypanosome vectors become drug-resistant over time, requiring constant monitoring for resistance and the ability to switch drugs. Trapping and spraying the tsetse fly can be helpful, but is also difficult on a large scale. Adoption of trypano-tolerant cattle (e.g., Zebu and N'Dama) may be a viable solution in the long term, but is currently limited in application. Although adoption of resistant breeds may not be possible on a large scale any time soon, the alternative, European breeds, are highly susceptible, which may help explain the predominance of local breeds among surveyed households in Table 3-6. FGD participants in Borena indicated some NGOs (e.g., Oromo Self-Help Organization and AFD) had provided goat restocking in the wake of drought, but that the animals were not well-suited to local conditions and subsequently died from disease.

In Borena, the government has built a veterinary clinic in Miyo to address animal diseases but it is not yet operational. In some communities, the elders coordinate the collection of money from every household to pay trained vets to buy drugs and vaccinate their animals. This helps the community to get vet service through their own efforts.

## Availability of Other Services and Infrastructure

Table 6-11 provides data on the availability of infrastructure and services other than animal health services in communities.

**Table 6-11. Availability of Infrastructure and Services in Communities**

Indicator	All	Project Area	
		Borena	Jijiga
<b>Infrastructure (% of communities)</b>			
Piped water used by at least half of households	3.4	5.7	0.0
Electricity used by at least half of households	0.0	0.0	0.0
Cell phones used by at least half of households	46.8	35.5 <sup>a</sup>	64.0 <sup>a</sup>
A public telephone is available within 5 km	46.6	36.8	61.4
The community can be reached by a paved road	18.1	25.7 <sup>a</sup>	6.6 <sup>a</sup>
Public transportation available within 10 km	47.0	45.5	49.2
<b>Services</b>			
A primary school is available within 5 km	92.9	90.9	95.9
A secondary school is available within 5 km	14.7	14.7	14.7
Adult education is available	48.3	77.5 <sup>a</sup>	4.1 <sup>a</sup>
A health center is available within 5 km	79.8	76.2	85.3
Animal services are available within 5 km <sup>c/</sup>	74.6	85.3 <sup>a</sup>	58.4 <sup>a</sup>
Agricultural extension services are available	76.4	82.3	67.5
Security or police can reach community within one hour	43.4	47.2	37.6
Availability of institutions that provide assistance in times of need			
Food assistance	44.9	67.5 <sup>a</sup>	10.7 <sup>a</sup>
Housing materials and other non-food items	19.3	32.1 <sup>a</sup>	0.0 <sup>a</sup>
Assistance due to losses of livestock	14.9	24.7 <sup>a</sup>	0.0 <sup>a</sup>

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons across columns.

<sup>c/</sup> Veterinary center, abattoir or dairy processing facility.

The most commonly available type of infrastructure is cell or public phone services, readily available in just under half of communities in the IE area.<sup>67</sup> The cell phone network, operated by the state-owned Ethiopia Telecom, is the most widely available piece of infrastructure in Jijiga, and understandably popular in an area where few communities are accessible by paved road. About half as many communities in Borena have cell phone access, but communities there have somewhat better access to a road network. Although a majority of households have animal services available nearby, FGs are dissatisfied with the range and quality of the services.

Primary education facilities are widely available: More than 90 percent of all communities in the IE area have a primary school within 5 kilometers. Health centers, animal services, and agricultural extension services are available in or near over 75 percent of all communities. However, only 43 percent of communities have access to security or police that can reach it within one hour.

<sup>67</sup> Availability of cellphone service in a community is defined as more than half of households using cell phones.

With the exception of cell or public phone service access, Borena generally has greater access to services and infrastructure. Food assistance is widely available to communities in Borena, but not to most communities in Jijiga.

### Qualitative Data on Access to Infrastructure and Services

FG participants talked about the multiple negative consequences of limited access to roads, particularly on women's health and on market access. In Borena, men mentioned that lack of transportation limits access to emergency services, health services (especially for pregnant women), purchasing food, and implementation of development activities.

*"The health post, school, and veterinary clinic are not prepared with professionals or equipment. We travel to Jijiga for medical support. Even pregnant and bleeding mothers travel to Jijiga for treatment."*

—Male FGD participant in Jijiga

FGDs indicated that many rural *kebeles* have only one health post, which is often inaccessible to those who live in remote areas. In Sarite *kebele* (Teltele *woreda*) in Borena, there is reportedly one health post for five *kebeles*. Even for those who can access health posts, the facilities are unable to manage critical or emergency medical cases. FG participants indicated that if a patient is referred to a hospital, it is difficult (even for "wealthy" families) to go due to lack of road infrastructure and transportation services. In such cases, it is reportedly common for a patient's family and friends to carry them to a hospital on foot or on a donkey. Some patients die on the way. The lack of available urgent health care services is most often a problem for pregnant women. In an emergency, households in rural areas have the option of hiring automobile transportation to the health clinic in the main town, but the cost (5000-7000 birr, about U.S. \$257-\$360) is well beyond the capacity of many local residents.

Male FGD participants in Dembe Gaya (Teltele *woreda*) in Borena report that malaria epidemics are very common in the area, and people cannot afford the cost of treatment. Though mosquito nets were provided to some community members, there are many others who could not get them.

Male FG participants in Jijiga also say that lack of high-quality health care is a major stress in the community. Health posts can treat only minor illnesses and, without a midwife, mothers and babies frequently die in delivery. Health extension workers claim that they are severely understaffed (e.g., there are five health extension workers for approximately 2,600 households in Surupa *kebele* in Borena). Female FG participants in Jijiga believe that there is little they can do to respond to the lack of health services and equipment. "We couldn't apply to the government about the situation because we don't know how to do so. We are uneducated, poor, and just pastoralists, nothing else."

## 6.7 Access to Information

Access to information is an important component of the dimension of resilience called "adaptive capacity," the capacity to take proactive decisions to cope with shocks. Table 6-12 shows that households in Borena have much better access to all types of information than those in Jijiga,

despite the higher use of cell phones in Jijiga. Although two-thirds of households in Borena area say they have access to information on current market prices, male FG respondents in the regions characterize themselves as price-takers in livestock sales due to lack of information. Pastoralists tend to have access to a wider variety of information than agro- and non-pastoralists; non-pastoralists tend to have the lowest access to information.

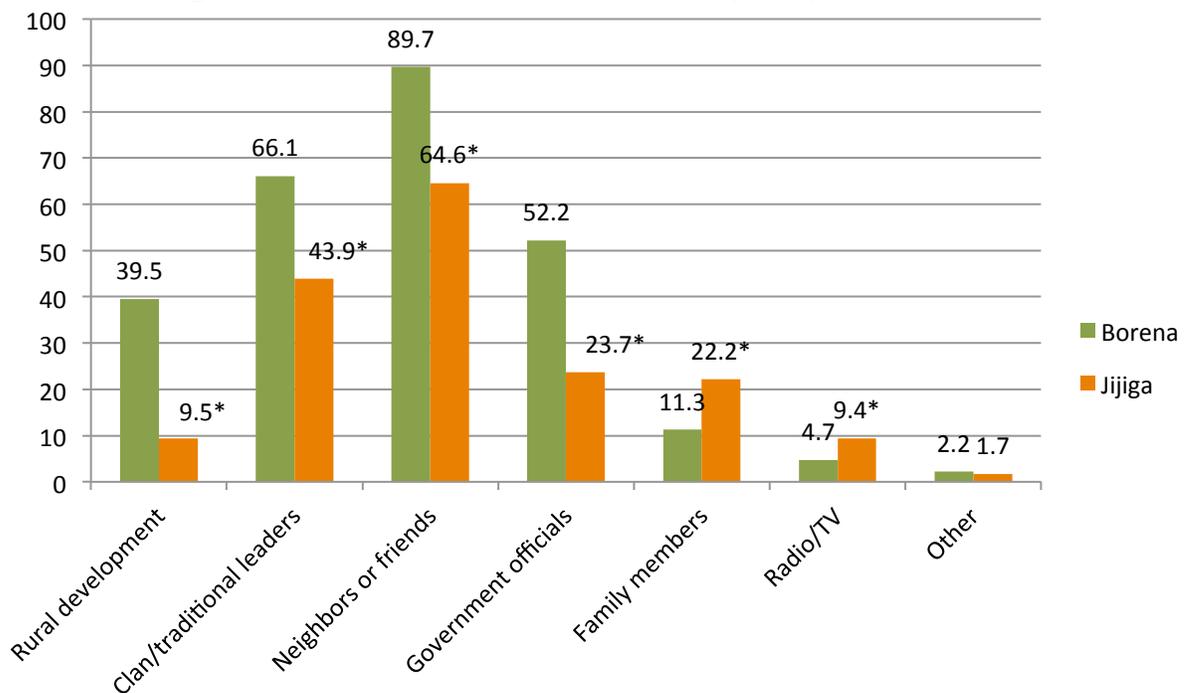
**Table 6-12. Percent of Households with Access to Various Sources of Information**

Type of Information	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
Long term changes in weather patterns	35.3	45.3 <sup>a</sup>	10.7 <sup>a</sup>	42.2 <sup>a</sup>	35.5 <sup>a</sup>	24.6 <sup>a</sup>	38.0 <sup>a</sup>	29.2 <sup>a</sup>
Rainfall prospects	47.0	60.2 <sup>a</sup>	14.0 <sup>a</sup>	55.6 <sup>a</sup>	47.4 <sup>a</sup>	33.3 <sup>a</sup>	49.9 <sup>a</sup>	40.4 <sup>a</sup>
Local water prices and availability	54.2	66.1 <sup>a</sup>	24.4 <sup>a</sup>	58.3 <sup>a</sup>	58.3 <sup>b</sup>	40.8 <sup>ab</sup>	56.7 <sup>a</sup>	48.7 <sup>a</sup>
Methods for animal health/husbandry	37.2	46.0 <sup>a</sup>	15.0 <sup>a</sup>	44.9 <sup>a</sup>	39.3 <sup>a</sup>	21.4 <sup>a</sup>	39.5 <sup>a</sup>	31.8 <sup>a</sup>
Livestock disease threats	39.7	49.0 <sup>a</sup>	16.3 <sup>a</sup>	48.4 <sup>a</sup>	40.3 <sup>a</sup>	25.1 <sup>a</sup>	41.9 <sup>a</sup>	34.6 <sup>a</sup>
Current market prices for animals in the area	55.7	66.1 <sup>a</sup>	29.8 <sup>a</sup>	62.4 <sup>a</sup>	60.0 <sup>b</sup>	37.8 <sup>ab</sup>	57.7 <sup>a</sup>	51.2 <sup>a</sup>
Market prices for animal products	50.4	58.2 <sup>a</sup>	31.1 <sup>a</sup>	57.7 <sup>a</sup>	53.8 <sup>b</sup>	33.0 <sup>ab</sup>	51.7	47.4
Grazing conditions in nearby areas	57.9	71.0 <sup>a</sup>	25.5 <sup>a</sup>	67.8 <sup>a</sup>	60.4 <sup>a</sup>	37.9 <sup>a</sup>	61.0 <sup>a</sup>	51.0 <sup>a</sup>
Conflict or other restrictions in access to grazing	45.2	54.1 <sup>a</sup>	22.9 <sup>a</sup>	52.1 <sup>a</sup>	46.6 <sup>b</sup>	32.0 <sup>ab</sup>	47.6 <sup>a</sup>	39.6 <sup>a</sup>
Business and investment opportunities	13.7	18.2 <sup>a</sup>	2.8 <sup>a</sup>	17.7 <sup>a</sup>	13.8 <sup>a</sup>	7.6 <sup>a</sup>	15.1 <sup>a</sup>	10.7 <sup>a</sup>
Opportunities for borrowing money	21.6	29.5 <sup>a</sup>	1.6 <sup>a</sup>	27.0 <sup>a</sup>	21.7 <sup>b</sup>	13.2 <sup>ab</sup>	23.8 <sup>a</sup>	16.4 <sup>a</sup>
Market prices for food	51.2	60.5 <sup>a</sup>	27.8 <sup>a</sup>	55.4 <sup>a</sup>	54.6 <sup>b</sup>	38.6 <sup>ab</sup>	53.3 <sup>a</sup>	46.4 <sup>a</sup>
Child nutrition and health info	43.9	55.3 <sup>a</sup>	15.5 <sup>a</sup>	54.9 <sup>a</sup>	40.7 <sup>a</sup>	32.9 <sup>a</sup>	46.6 <sup>a</sup>	37.8 <sup>a</sup>

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

The primary source of information in the IE area is neighbors and friends, followed by clan/traditional leaders. As seen in Figure 6-7, Borena households are more likely than Jijiga households to get information from rural development agents, clan/traditional leaders, neighbors or friends, and government officials. While they are not very widely used sources, family members and radio or TV are more common information sources in Jijiga than Borena.

**Figure 6-7. Sources of Information, by Project Area**



\* Indicates significantly different at the 0.05 level. **NOTE:** Sources only given for households that received any information in the last year.

### Qualitative Data on Access to Information

Male FGDs in multiple communities in Borena claimed that their community has no information about markets and prices, though there is access to markets. The sources of information about market prices are typically traders and individual visits to the marketplace prior to making a decision to sell. People are not in a position to make contact with traders due to limited road and telephone infrastructure. As a result, they are often persuaded to sell livestock to brokers below fair market prices.

In Borena, male FGD participants state that because there is no cell phone coverage in their area, they are unable to exchange information with others outside their community (cited as a stress). They also explicitly stated that their inability to “directly communicate with traders” (forcing them to deal with brokers) was “the biggest challenge related to marketing livestock.”

The men stressed that they are affected negatively by the brokers when they want to sell their products: They sell for a cheap price while the traders resell the same product for a very high price. Some men claim they are spurred to sell animals at a low price or “on credit” due to the fear of disease or drought, or the potential loss of cattle during the return trip (should they choose not to accept the low price).

## 6.8 Availability of Disaster Planning and Response Services

A final key element of households' resilience in the face of shocks is the availability of disaster planning and response services. Table 6-13 provides community survey data on the percentage of communities with these services, showing that communities must be largely self-reliant in planning for and responding to disasters. No communities in Jijiga reported having these services; about a third of Borena communities have such services, available from government or NGOs.

**Table 6-13. Percent of Communities with Disaster Planning and Response Services**

	All	Project Area	
		Borena	Jijiga
<b>Disaster planning service</b>	<b>20.6</b>	<b>34.2<sup>a</sup></b>	<b>0.0<sup>a</sup></b>
Government planning service	15.1	25.1 <sup>a</sup>	0.0 <sup>a</sup>
NGO planning service	11.7	19.4 <sup>a</sup>	0.0 <sup>a</sup>
<b>Disaster response service</b>	<b>18.7</b>	<b>31.1<sup>a</sup></b>	<b>0.0<sup>a</sup></b>
Government response service	14.3	23.8 <sup>a</sup>	0.0 <sup>a</sup>
NGO response	10.7	17.7 <sup>a</sup>	0.0 <sup>a</sup>

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

### Qualitative Data on Disaster Planning and Response Services

Some communities report that they receive warning from NGOs and government that rainfall is declining and a dry period is coming, and they need to sell their animals before losing them. Others claim they have little or no advance information from the government or any other agency related to impending drought. Instead, respondents in some male FGs in Borena say they obtain information from *usa*, men who look into the fascia of the small intestines of animals to forecast drought, and *ayantu*, who look into the stars to forecast. Both are collectively called *ragdota* or *raga*, those who have special talents and skills in forecasting what will happen in the future. “The information they provide is sometimes true and sometimes not true.”

Female FGD respondents in Jijiga say that community members cooperate to prevent and recover from damage caused by flooding. In the Halahago *kebele*, during the last flood, the community came together to protect community school exercise books from being damaged. Female FG participants in Tikdem *kebele* had a similar response: They come together to decide on a course of action for approaching government with requests for assistance. They also reportedly work collectively to prepare sandbags and other flood mitigation activities aimed at preventing damage to farm land.

## 6.9 Indexes of Household Resilience Capacity: Absorptive Capacity, Adaptive Capacity, and Transformative Capacity

Building resilience requires an integrated approach and a long-term commitment to improving three critical capacities: absorptive capacity, adaptive capacity, and transformative capacity.<sup>68</sup>

- **Absorptive capacity** is the ability to minimize exposure to shocks and stresses (*ex ante*) where possible and to recover quickly when exposed (*ex post*).<sup>69</sup> Improved disaster risk management is aimed at strengthening absorptive capacity at the community and household levels, helping them to reduce disaster risk and absorb the impacts of shocks without suffering permanent, negative impacts on their longer-term livelihood security.
- **Adaptive capacity** involves making proactive and informed choices about alternative livelihood strategies based on changing conditions. Interventions to improve adaptive capacity are aimed at improving the flexibility of households and communities to respond to longer-term social, economic, and environmental change. This necessarily entails promoting livelihood diversification, supporting asset accumulation, and improving the social and human capital available to vulnerable populations.
- **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. Each of these capacities is not mutually exclusive.

Given their complexity, measuring the resilience capacities requires combining a variety of indicators of underlying concepts relevant in a particular setting into one overall indicator. Most of the indicators for absorptive and adaptive capacity are derived from the household questionnaire; some are derived from the community questionnaire. Most of the transformative capacity indicators are derived from the community questionnaire; some are derived from the household questionnaire. The following are the indicators used to create an index measuring each capacity for the PRIME IE area. Many of the indicators were discussed earlier in this chapter.

Absorptive capacity<sup>70</sup>

- Bonding social capital
- Shock preparedness and mitigation (e.g., livestock off-take)
- Access to informal safety nets
- Availability of hazard insurance

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<sup>68</sup> Béné, Wood, Newsham and Davies (2012).

<sup>69</sup> The descriptions of absorptive, adaptive, and transformative capacity are from Frankenberger et al. (2012b).

<sup>70</sup> Availability of conflict mitigation is also important but could not be included because all but one community has a conflict resolution committee. Such low variation across communities does not allow for the factor analysis procedure used in calculating the index to estimate correlations with the other indicators.

- Household ability to recover from shocks
- Whether any household member holds savings
- Asset ownership

#### Adaptive capacity

- Bonding social capital
- Linking social capital
- Human capital
- Aspirations and confidence to adapt
- Exposure to information
- Diversity of livelihoods
- Access to financial resources
- Asset ownership

#### Transformative capacity

- Bridging social capital
- Linking social capital
- Access to formal safety nets
- Access to markets
- Access to infrastructure
- Access to basic services
- Access to communal natural resources
- Access to livestock services

Appendix 1 has a detailed explanation of how each index was calculated. All are placed on a scale of 0-100.

Table 6-14 reports means of the absorptive capacity, adaptive capacity, and transformative capacity indexes. A clear pattern emerges. Consistent with the evidence presented in previous chapters, Borena households have higher resilience capacity than Jijiga households.

**Table 6-14. Indexes of Absorptive, Adaptive and Transformative Capacity**

Indicator	All	Project Area		Pastoralist Status			PRIME Intervention Group	
		Borena	Jijiga	Pastoralist	Agro-Pastoralist	Non-Pastoralist	Low Intensity	High Intensity
Absorptive capacity	58.8	67.2 <sup>a</sup>	39.3 <sup>a</sup>	65.2 <sup>a</sup>	58.9 <sup>a</sup>	49.4 <sup>a</sup>	60.2 <sup>a</sup>	55.3 <sup>a</sup>
Adaptive capacity	46.1	52.1 <sup>a</sup>	32.2 <sup>a</sup>	52.1 <sup>a</sup>	45.7 <sup>a</sup>	38.3 <sup>a</sup>	47.5 <sup>a</sup>	42.5 <sup>a</sup>
Transformative capacity	46.8	52.5 <sup>a</sup>	33.5 <sup>a</sup>	51.9 <sup>a</sup>	45.4 <sup>a</sup>	42.0 <sup>a</sup>	47.8	44.2
<b>Resilience Capacity</b>	<b>49.2</b>	<b>56.0<sup>a</sup></b>	<b>33.5<sup>a</sup></b>	<b>55.2<sup>a</sup></b>	<b>48.5<sup>a</sup></b>	<b>41.8<sup>a</sup></b>	<b>50.5<sup>a</sup></b>	<b>45.9<sup>a</sup></b>

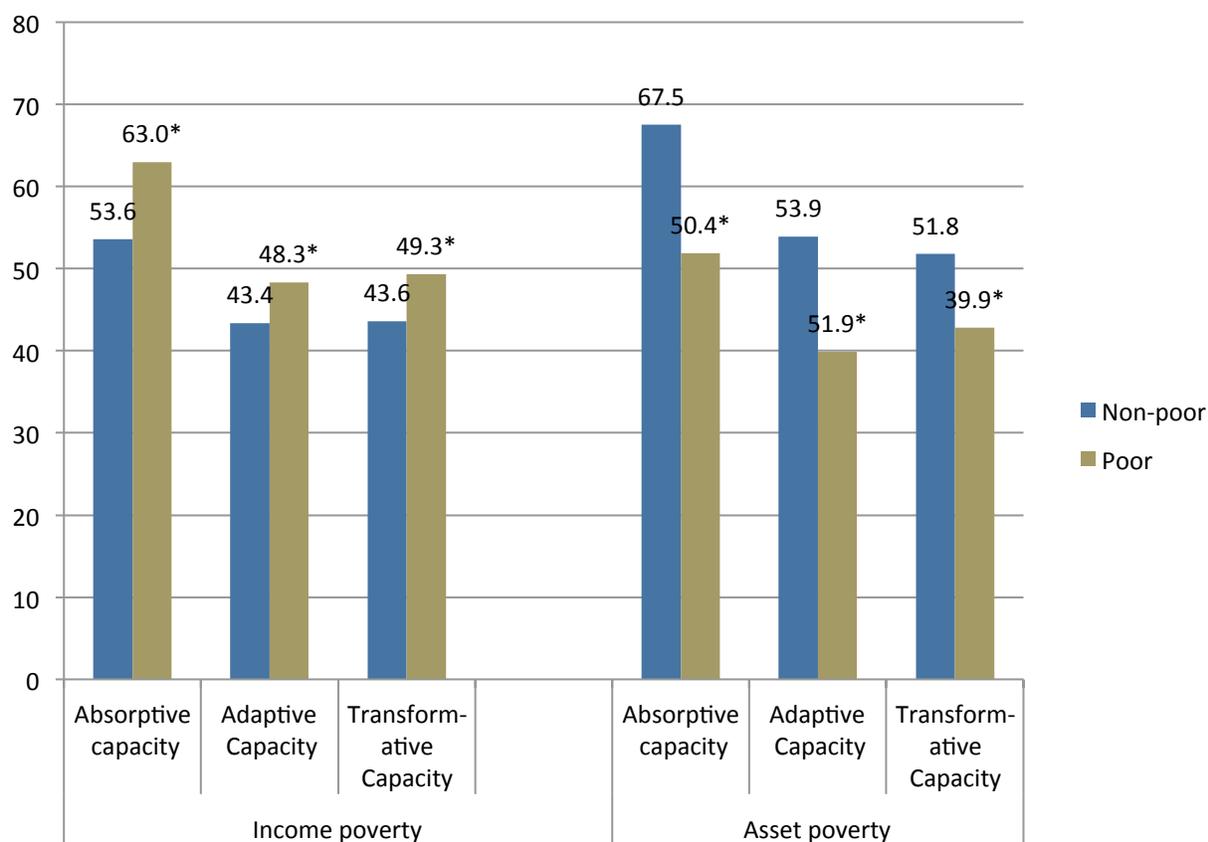
<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

This finding indicates that Borena households are more successful in anticipating and responding to challenges to their livelihoods, and at accessing resources in the wider support system offered by government and NGOs.

Another clear and pervasive pattern is that pastoralists have higher resilience capacity than agro-pastoralists, and agro-pastoralists in turn have higher resilience capacity than non-pastoralists. As discussed in the introduction, non-pastoralists' vulnerability likely stems from the challenges faced by households forced to transition out of pastoralism and seek alternative livelihoods, including the limited availability of income-generating opportunities and limited access to financial and other support services to start businesses.

Figure 6-8 shows how absorptive capacity, adaptive capacity, and transformative capacity differ by poverty status. The relationship is now familiar: Contrary to intuition, the income poor are measured as having greater resilience capacity than the income non-poor. Apparently, in this setting, being able to consume higher amounts of goods and services, including food, does not indicate that a household will be more resilient to shocks. However, owning a large number of assets is strongly associated with resilience capacity. The asset non-poor have greater resilience capacity than the asset poor. This result reflects a lower ability of asset-poor households to absorb shocks, adapt to changing conditions, and access wider formal systems that strengthen their capacities.

**Figure 6-8. Indexes of Absorptive, Adaptive and Transformative Capacity (Means), by Poverty Status**



\* Indicates significantly different at the 0.05 level.

## Qualitative Data on Absorptive Capacity

FG participants in Jijiga and Borena gave many examples of how they now take preventive measures based on what they have learned from previous shocks. Female FG participants in Jijiga provided examples of how they have adapted to the threat of floods by building terraces on agricultural land and creating drainage canals for flood water. Other women built a water reservoir for their cattle, and will now take animals to the animal health post when they are sick. The female FG participants in Jijiga further discussed how they used to migrate in response to drought, but now work together to protect their farm and animals from drought and flood. Other women say that households in their community organize into groups of five to 10 households to plow fields together.

Male FG participants in Jijiga report that the community came together to plan a course of action in response to unpredictable rainfall and drought. They decided irrigation was the best solution and dug about 15 wells. However, they lack pumps to get the water to the crops or cement to line the wells. In Borena, communities try to develop *elas*, traditional water wells, during droughts. They hold a community meeting and decide on the date and time they use the *elas*, and small groups take turns fetching water from the available *elas*. Both men and women develop ponds during rainy seasons to use during the dry season, but they quickly dry out.

Communities in Borena are reportedly increasingly willing to involve government to solve conflicts. When there are conflicts with other tribes, first elders/representatives from each tribe come together and discuss. If it is beyond their capacity they call for mediation support at the *woreda* and region level. Currently, the level of tension between some ethnic groups is declining because they more frequently discuss how to handle matters related to using resources using a local government representative as an intermediary.

A group of women in Surupa *kebele* in Borena started saving but claims that it has not been effective because follow up and support were not available. The women said that there were many of them when starting the saving, but now there are only about nine who keep on saving even though they do not know what to do with the savings. Women believe they have nothing to do as a group but that men have functional networks.

When disaster strikes a household, the affected community members seek support from within their clan groups through a social security network called *Busa Gonofa*.<sup>71</sup> This is a traditional practice wherein respected elders gather and respond to community members who need help to become normal functioning members of the community again. The elders first assess the member seeking support. If he or she has shown positive behavior in the past, then that person is deemed deserving of support from the clan. He/she will not be asked to pay back whatever support is given. However, if the person regains capacity, he or she is expected to provide support to the needy members of the community.

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<sup>71</sup> Caritas Czech Republic. 2009.

### Qualitative Data on Adaptive Capacity

FGDs with community members showed that people were taking action to adapt to changing economic and environmental conditions. Female FGD participants in Jijiga claim that in the past they engaged in small-scale agriculture on their own lands and had no other livelihood strategies. Now, they have begun to sell cattle and rent additional parcels of land that they cultivate simultaneously in case the crop on their own land is insufficient or lost. They also claim that hunger is no longer common in their community, even during periods of drought. Rather than “sitting and waiting for help,” they are more likely to go to the mountains to collect firewood that they then sell in the city. Alternatively, they might work as maids in the city or purchase *chat* in the city to sell in the village. The men observed that some people were better able to cope in drought seasons and times of hardship because they had diversified their livelihoods and were flexible in responding to the shocks.

Men in the Tikdem *kebele* in Jijiga reported having better access to cattle and grain prices via brokers on mobile phones compared to without mobile phones. They said that access to mobile phones is increasing but there is currently no government or NGO involvement in boosting access.

Several male and female FGD participants in Borena identified greater willingness to support school attendance as an important means of adaptation to changing economic and environmental conditions. Female FGD participants in Jijiga also said, in addition to greater support for children’s education, women were prepared to seek educational opportunities for themselves. Doing so makes them feel better prepared to directly address problems in society. However, in Borena, participants in female FGDs consistently seem less knowledgeable and less empowered for collective action than their male counterparts. For example, in Surupa, women indicated that they lacked knowledge on how to get together as women and do something.

### Qualitative Data on Transformative Capacity

According to FG participants in Borena, government officials (i.e., teachers, extension agents, health extension workers, and *woreda* administrators) and NGOs are often the facilitators of collective community actions that can bring about the system-level changes that underlie transformative capacity. Collective action is coordinated by clan and sub-clan leaders, as well as government structures such as *kebele* administrators, extension agents, zone (*kebele* level) leaders, and the leaders of groups of households, who convey messages about collective action and emergency warnings.

Many communities say they have good links with government. FG participants say that the government is grouping communities into Five-in-One networks so that they can collectively overcome challenges and be involved in development activities. When a need arises, communities report to the government; if government cannot offer support, it will link them to NGOs.

Government representatives have also worked to formally facilitate women’s empowerment by raising awareness of their rights to equality and ownership of assets. Women also participate in

training from NGOs and government, and some have organized in groups to save and borrow money, though inclusivity of such groups is reportedly a challenge.

FG respondents in Jijiga also report that relations with the government have gone from very little contact to what is now a “useful” relationship in terms of social protection and conflict mitigation. Women in Jijiga say that the government has supported them by providing farm inputs and information, and advice on which vaccinations to obtain for their animals. However, male FGD participants in Jijiga talked about their dissatisfaction with a water reservoir under construction, the design of which will not meet the water needs of the community.

### ***Insights on Resilience Capacity from Interviews with Positive Deviants***

Positive deviants are people within the community who have the same assets and access as other community members, but are more successful at leveraging those assets in a way that makes them more resilient than similar households. All of the positive deviants spoke about hard work as being part of why they are better off than others in their community. Several even indicated they had lost everything in one area (often where they had grown up) and moved to another area where they asked for and received land, animals, or both to get started again. One man indicated he had been the least performing herder in his community at one time, but had left that community and after working hard (including receiving help), he had received a prize in Addis Ababa as the top herder in his new community.

Although there is a strong sense of duty toward providing help (e.g., food, money, animals, or labor) to the poor in all the communities interviewed, expecting such help may not constitute an effective strategy for enhancing household resilience. Rather, the success of most positive deviants appears to result from having taken advantage of an opportunity when it arose or from “thinking ahead” in order to prepare for and deal with shocks and stressors. All were active participants in their success, even though most relied on some form of help at one time or another. Only one respondent indicated it was by “the grace of Allah” that he was a wealthy agro-pastoralist.

Other factors contributing to perceived resilience among the positive deviants are a positive attitude, being open to new ideas, and willingness to make things happen. All of the individuals interviewed as positive deviants:

- Felt confident in their own abilities and intuition
- Recognized the importance of education/training
- Diversified their income sources
- Used safety nets when needed and helped others where possible
- Believed in hard work
- Planned ahead
- Used better practices
- Were not limited by cultural beliefs
- Practiced saving and investing in productive assets

All of those interviewed seemed to appreciate the importance of preventive strategies to help minimize risk of exposure to or the impact of potential shocks. Diversification of income, particularly in livelihood strategies that are not vulnerable to the same types of shocks, was a common theme. Several had three sources of income, with at least one source not vulnerable to the same types of shocks as the other sources (e.g., crops, livestock, small shops, and transportation). Others relied on both crops and livestock but had large quantities of productive assets (e.g., livestock) to help buffer the impact of drought or floods. Additionally, there was widespread belief among them that diversity in the type of livestock was also important, with camels considered the least vulnerable to the types of main shocks and stressors common in the region.

Adoption of improved practices or the willingness to innovate and try new things was also common across all positive deviants. Even in the face of a cultural belief that using pesticides was against the will of Allah, one of the individuals interviewed protected his crops from damaging insects and harvested more than others in his community. He was also willing to plant early in order to coincide with shifts in the timing of the rains, even though it meant not planting during the “traditional” planting season. Those who continued to plant when the rains “traditionally” came usually had low yields due to lack of rainfall. Other strategies included moving cattle from drought-afflicted areas to areas with better pasturelands, using post-harvest materials (e.g., stems and leaves) as fodder, constructing bunds or terraces to protect against flooding, and planting drought-tolerant trees.

All the positive deviants used savings to deal with shocks or stressors. Some had cash savings in their households, but all used savings to invest in livestock, which were then sold in times of need or to invest in small businesses. One positive deviant, Halima (see box), uses money she earns to buy goats and cattle, rather than saving it as cash. She also has a good relationship with traders where she sells *chat*; they provide her with credit for household goods such as coffee, sugar, and soap.

## 6.10 Community Resilience

Community resilience is defined in this report as:

*The general capacity of a community to absorb change, seize opportunity to improve living standards, and to transform livelihood systems while sustaining the natural resource base. It is determined by community capacity for collective action as well as its ability for problem solving and consensus building to negotiate coordinated response.*<sup>72</sup>

*“Halima is a widow who runs a grinding mill and sells chat on the side to help augment her income, particularly when there is nothing to grind due to poor harvests. When her mill needed repairs, she bought chat from farmers and resold it in nearby towns to earn money for repairs.”*

—Positive deviant in  
Jijiga

Data collected as part of the baseline community survey give insight into the strength of community resilience in the PRIME IE area as well as how it differs between Borena and Jijiga. Note that it is not possible to examine differences by pastoralist status group and intervention group using the community-level data because membership in these groups is determined at the household, not community, level.

<sup>72</sup> Walker, Sayer, Andrew, and Campbell. 2010.

The presence of community organizations gives an indication of the strength of community resilience in the PRIME IE area. Table 6-15 gives the percent of communities having different types of organizations.

**Table 6-15. Community Organizations Available, by Project Area**

Type of Organization	All	Project Area	
		Borena	Jijiga
Water users' group (%)	46.1	65.8 <sup>a</sup>	16.2 <sup>a</sup>
Grazing land users' group	41.4	68.5 <sup>a</sup>	0.0 <sup>a</sup>
Disaster planning group	23.4	39.3 <sup>a</sup>	0.0 <sup>a</sup>
Credit or micro-finance group	37.0	61.5 <sup>a</sup>	0.0 <sup>a</sup>
Savings group	40.4	67.2 <sup>a</sup>	0.0 <sup>a</sup>
Zakat	40.5	4.5 <sup>a</sup>	93.4 <sup>a</sup>
Mutual help group	52.3	83.6 <sup>a</sup>	5.1 <sup>a</sup>
Trade or business associations	21.6	23.4	18.8
Civic group	19.5	32.5 <sup>a</sup>	0.0 <sup>a</sup>
Charitable group	10.0	17.1 <sup>a</sup>	0.0 <sup>a</sup>
Religious group	48.1	78.3 <sup>a</sup>	2.5 <sup>a</sup>
Political group	75.0	92.6 <sup>a</sup>	48.2 <sup>a</sup>
Women's group	72.4	84.0 <sup>a</sup>	54.8 <sup>a</sup>
Youth group	61.1	61.9	59.9

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

Overall, Borena has more community organizations than Jijiga. Political groups are the most prevalent organizations in Borena: Nearly all communities (92.6 percent) have organized political groups. The second most common community organizations in Borena are women's groups and mutual self-help groups; religious groups are the third most common. Approximately two-thirds of communities in Borena have land user groups, savings groups, water users' groups, or credit and microfinance groups, all of which require a high degree of cooperation to be successful. Although community presence of mutual self-help groups is high, few communities have charitable groups and *zakat* groups. This reflects cultural expectations of mutual aid and perhaps a low need to have organized groups to provide charity to poor households in times of stress, as well as a mixed religious population.

In Jijiga, only eight of the 14 types of community organizations are present. Of those, nearly all communities have a *zakat* group. There are almost twice as many *zakat* groups as the next most common types of groups (youth groups, women's groups, and political groups). Only a small percentage of communities have organizations dedicated to mutual self-help.

A summary measure of community resilience can be calculated from the community survey data based on five types of collective action a community can engage in: communal NRM, disaster risk reduction, social protection, managing and maintaining public goods, and conflict management. Appendix 1 details how indicators of these collective actions are combined into an overall index of community resilience.

Table 6-16 reports means of the index of community resilience and of the indicators that are sub-components of the index. Given the high dependence on natural resources in the IE area, the number of NRM groups in communities is quite low (1.2 on average). Roughly 50 percent of communities have a land management group, 14 percent a firewood resources management group, and only 3 percent a water resources management group (data not shown). While a variety of groups provide some social protection in many communities, and most communities have a conflict management group, only 23 percent have disaster risk reduction groups and information on weather, including rainfall, is scarce.

According to the overall index of community resilience, Borena has far higher community resilience than Jijiga. This difference holds for all five indicators of community resilience.

**Table 6-16. Community Resilience**

Indicator	All	Project Area		PRIME Intervention Group	
		Borena	Jijiga	Low Intensity	High Intensity
<b>Community resilience index</b>	<b>43.8</b>	<b>65.5<sup>a</sup></b>	<b>10.1<sup>a</sup></b>	<b>44.2</b>	<b>42.1</b>
<b>Index components</b>					
Number of natural resource management groups (mean)	1.2	1.7 <sup>a</sup>	0.4 <sup>a</sup>	1.2	1.1
Disaster risk reduction index	0.4	0.6 <sup>a</sup>	0.1 <sup>a</sup>	0.4	0.4
Social protection index	0.6	0.8 <sup>a</sup>	0.4 <sup>a</sup>	0.6	0.6
Presence of a civic (“improving community”) group (%)	19.5	32.5 <sup>a</sup>	0.0 <sup>a</sup>	20.5	15.7
Conflict mitigation: % of households in community that received information on conflict in the last year	41.8	54.2 <sup>a</sup>	22.5 <sup>a</sup>	42.2	39.8

<sup>a,b</sup> Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

### **Perspectives on Community Resilience from the Qualitative Data**

Female FG participants in the Kudamanta *kebele* in Jijiga portray their community as relatively cohesive in terms of management of water access. “When we use communal properties like water, we use them properly . . . To minimize conflict there is a controller who makes us keep our queue.” They are led by community elders and religious leaders during times of stress, but will come together as an entire community to discuss responses and solutions.

According to female FG participants, women in the community also help one another in the event of conflict by sharing food among households. Some women explained that when they first came to the Kudamatana *kebele*, the community gave them “houses and land.” They also borrowed beans until they could produce their own, at which point they returned what they borrowed (in produce). They were also permitted to borrow from local shops. Several respondents noted that women in their communities had initiated informal savings groups without external assistance as a means of supporting particularly needy households during difficult times.

Female FG participants in the Halahgo *kebele* in Jijiga report that conflict over management of agricultural land occurs occasionally between community members. In such cases, community elders try to resolve the problem and, if deemed necessary, will levy fines against guilty farmers. They further explained that if the situation gets out of hand, the elders will take the issue to *kebele* leaders in pursuit of justice.

Informal social protection mechanisms extend to households in other communities. For instance, according to FG participants, when farms in another *kebele* were flooded, contributions were solicited from every household in both *kebeles* to rent a tractor needed to back fill the land that was washed away. In the case of shocks, the community may request support from educated community members who live far away; these people often respond to such requests.

However, FG discussions about relations with other groups and communities frequently highlighted conflict over pasture and water, especially when migration occurs in response to drought stress. A female FG respondent in Jijiga stated, “We do not trust the Oromo people who share a border with us, but we trust each other. When we face any problem, we help each other. We cannot plow our land because our farm land is in Oromo district and we migrate at the time of the conflict.”

*“We need to work together as a group and get out of poverty.”*

–Male FGD participant in Borena

Female FG participants in Borena claimed that as long as they stay in their village there is no conflict, but when they migrate (due to drought and lack of pasture), they face conflict with Guji and Konso tribes, as well as theft of livestock. Male FGD participants in Borena reported that the community gets into smaller groups in defensive areas to protect their members from other clans competing for pasture and water. If the situation is beyond their control, they request government intervention. Community and tribe elders get together and assist in resolving the conflict. There is a mechanism by which the community that causes damage pays compensation to the victims.

Men in Halahago *kebele* in Jijiga report that “there is reduced tendency of love and cooperation during droughts. Even if it breaks a family, some steal livestock and sell elsewhere, and conflict arises between the two families.” These situations are usually resolved by elders, who require offenders to pay back the money. In their view, community leaders also equally and fairly distribute the things government and other organizations provide.

## 6.11 Differences in Results by PRIME IE Intervention Group

Given that resilience is a key dimension of households’ well-being that the PRIME project is trying to improve, it will be especially important to take into account any baseline differences across the PRIME IE intervention groups in this variable when undertaking the project impact assessment. The LI intervention group appears to have somewhat higher resilience capacity than the HI intervention group. The indicators for which there is a notably higher value for the LI group are:

- Perceived ability to recover from shocks
- Percent of households receiving informal support

- Percent of households receiving capacity building support
- Diversity of livelihood sources
- Index of agricultural productive asset ownership
- Percent of households receiving information on a variety of topics
- Indexes of absorptive capacity, adaptive capacity, and overall resilience capacity

### ***SUMMARY: Resilience Capacity***

Resilience is a set of capacities that enable households and communities to effectively function in the face of shocks and stresses and still meet a set of well-being outcomes. This section reviews the findings from the quantitative and qualitative data collected in the PRIME IE baseline surveys on a wide range of characteristics that contribute to resilience. It also presents a set of indices that help assess the strength of resilience in the IE area.

**Ability to recover and coping strategies.** Households' subjective reports of their ability to recover from actual shocks is a key source of information on the strength of their resilience. Most quantitative survey households reported that they had *not* recovered from the shocks they had experienced in the previous year. From the qualitative data, nearly all focus group participants in Borena and Jijiga stated that shocks are becoming more frequent and are severely straining traditional coping strategies. These heightened shocks have motivated communities to undertake more cooperative activities to mitigate their effects, though people acknowledge that the scale of some shocks exceed their capacities. Households in Borena are better able to recover from shocks, especially economic shocks, than households in Jijiga. Pastoralists in particular, who comprise the largest population in Borena, are better able to recover from economic shocks than agro- or non-pastoralists. Pastoralists are also better able to cope with climate shocks through migration, though this often brings them into conflict with other groups.

Households in Borena and Jijiga use a similar narrow range of coping strategies in response to shocks, the most common ones being selling off livestock assets, reducing food consumption, and relying on family members for loans. Taking children out of school is avoided as a coping strategy, and permanent migration is not viewed as desirable unless there is little other choice. A substantial minority of households rely on access to government or NGO food-for-work or cash-for-work schemes.

**Aspirations and confidence to adapt.** Aspirations and confidence to adapt are psychosocial capabilities that are thought to give people greater resilience in the face of shocks. They are examined in this report using three indicators: absence of fatalism, belief in individual power to enact change, and exposure to alternatives to the status quo. These indicators are combined into an overall index. The index shows little or no difference in this aspect of resilience across the two IE areas or the pastoralist status groups.

However there are some notable differences in the index components across groups. The belief in individual power to enact change is stronger in Borena. Pastoralists are more likely to believe in individual power to enact change, but also more likely to have fatalistic attitudes. Exposure to alternatives to the status quo is very low among all groups. The qualitative data show that the high degree of fatalism among households in both IE areas is countered by an equally strong belief in individual power to enact change. This duality mirrors opinions expressed in focus groups, that while there are factors outside of individuals' control, such as drought and flood, households and communities that work hard and take measures to protect their assets will have better outcomes.

**Social Capital.** The quantity and quality of social networks and access to larger institutions in society are critical resources that people need both to survive and to improve their livelihoods. Social interactions and networks in Borena and Jijiga are complex, with many traditional mechanisms for community cooperation and control. Informal support from relatives, neighbors, or friends (e.g., loans, gifts, or remittances) is received far more often than formal support from government or NGOs (e.g., food rations and food-for-work or cash-for-work). A far higher percentage of households in Borena received social support of all kinds in the previous year than Jijiga. Borena households were also more likely to receive capacity building support (e.g., NRM training), which offers assistance for longer-term asset development.

Data were examined on three types of social capital: bonding social capital, the links between community members; bridging social capital, which connects members of one community or group to other communities or groups; and linking social capital, which is founded on vertical linkages between households/communities and some form of

higher authority or power. All three types of social capital are much stronger in Borena than Jijiga, and stronger for pastoralists than agro- and non-pastoralists.

**Livelihood Diversification, Ownership of Productive Assets, and Access to Markets, Services, Infrastructure, and Information.** Livelihood diversification is important for resilience because it allows flexibility, reducing households' vulnerability in the face of shocks. Households in Borena have a wider diversity of livelihood sources than those in Jijiga. Among the pastoralist status groups, agro-pastoralists have the widest diversity of livelihoods, followed by pastoralists and non-pastoralists. Ownership of productive assets, access to markets, services, infrastructure, and information are equally important factors determining households' resilience. While there are some exceptions (e.g., the availability of primary schools) throughout the IE area, these resources are limited. In general, conditions in this dimension of resilience are better in Borena than Jijiga, and better for pastoralists than agro- and non-pastoralists.

**Absorptive Capacity, Adaptive Capacity, and Transformative Capacity.** Building resilience requires an integrated approach and a long-term commitment to improving these three critical capacities. Examination of mean values of indexes of the capacities across population groups confirms that Borena households have higher resilience capacity than Jijiga households. Pastoralists are more resilient than agro-pastoralists. Non-pastoralists tend to be the least resilient.

**Community Resilience.** Community resilience is the capacity of communities to absorb change, seize opportunity to improve living standards, and to transform livelihood systems while sustaining the natural resource base. It is measured in this study in relation to five types of collective action in which a community can engage: disaster risk reduction, conflict mitigation, social protection, NRM, and managing and maintaining public goods (e.g., schools, health clinics, and roads). Following the pattern of household resilience, community resilience is stronger in Borena than Jijiga.

## Chapter 7. Links Between Shock Exposure, Resilience Capacities, and Well-Being Outcomes

This chapter explores the relationships between household shock exposure, resilience capacities, and key well-being outcomes of interest for the PRIME project—household food security and child nutritional status—using multivariate regression analysis. The objective is to understand whether the patterns seen in the data are consistent with the hypothesized impacts of shock exposure and resilience. The key questions explored are: Does shock exposure have a negative impact on food security and child nutritional status? Does greater resilience capacity have a positive impact on these outcomes? The impacts of both household and community resilience are looked at. Finally, does greater resilience capacity reduce the negative impact of shocks on the outcomes? If so, then we can say that it assists households in withstanding and recovering from shocks.

The food security indicators serving as dependent variables are:

- Per-capita dietary energy consumption
- Household Dietary Diversity Score (DDS)
- Household Food Insecurity Access Scale (HFIAS)
- Household Hunger Scale (HHS)

The measure of child nutritional status is the weight-for-height Z-score of children under 5, the measure used for the calculation of the prevalence of wasting (see Section 4.3). The measurement of each of these indicators is described in Chapter 4), and the regression models are given in Chapter 2.

The independent variables for the regressions include household demographic characteristics (number of adult equivalents and its square, the percentage of household members in various age-sex groups, and a dummy variable for female adult only households), education, pastoralist status, and the index of asset ownership, as described in Chapter 4. Recall that the regression method used is “community fixed-effects,” which controls for any unobserved, time-invariant differences across communities (*kebeles*) that may bias coefficient estimates, such as differences in terrain, climate, or cultural values.<sup>73</sup> This method allows for more accurate coefficient estimates.

Evidence of differences in the outcomes between Borena and Jijiga beyond that provided by the descriptive analysis of Chapter 4 is also of interest. These regional effects are reported along with the rest of the results. Note that it is not possible to obtain direct estimates of regional effects when community fixed-effects regression is employed. We thus run separate regressions to obtain these effects.<sup>74</sup>

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<sup>73</sup> Community fixed-effects is not employed for the regressions examining the impact of *community* resilience on the outcomes. When both community-level variables and the fixed-effects terms are included in the same regression equation, the coefficient estimates for the community-level estimates will not be accurate.

<sup>74</sup> Regional effects are estimates of the coefficient on a regional dummy variable indicating whether the household resides in Borena (versus Jijiga). The coefficient cannot be estimated when community (*kebele*) fixed-effects is employed because the two variables are perfectly collinear (there is no variation in the region dummy within each *kebele*).

## 7.1 Links Between Well-Being Outcomes and Shock Exposure

Table 7-1 reports the regression results examining the relationship between household shock exposure and the well-being outcomes. As detailed in Chapter 5, shock exposure is measured based on the number of shocks households are exposed to in addition to the perceived severity of each shock. Starting with the consumption indicators of food security, the evidence in the table suggests that shock exposure has no impact overall on per capita calorie consumption (i.e., the amount of food people eat), yet is associated with *higher* dietary diversity. When the food groups making up the DDS are examined individually, we find that roots and tubers (most likely *kocho*<sup>75</sup> in this case), vegetables, eggs, and milk and milk products are more likely to be eaten when shock exposure is higher. These appear to be the foods households turn to more when they are under stress. Given the high micronutrient and protein content of eggs, milk, and milk products, the result is a sign that households' dietary quality may be protected during times of stress.

The regression results for the experiential food security indicators signal clearly that shock exposure is associated with higher food insecurity, including its most extreme form, hunger. Recall that the underlying behaviors indicating hunger are not having any food in the household, members going to sleep at night hungry because there is not enough food, and members going a whole day and night without eating anything because there is not enough food. Probit regressions (results not shown) indicate that increased shock exposure leads to increased incidences of all three of these behaviors.

Shock exposure appears to have no association with acute child nutritional status, as indicated by the statistically insignificant coefficient on weight-for-height Z-score.

Other notable results in Table 7-1 are:

- Greater asset ownership works in the expected direction: Increased wealth is associated with increased food (calorie) consumption and dietary diversity, and with reduced food insecurity (according to the HFIAS) and hunger. Consistent with the descriptive results of Figure 4-3, it has no association with acute malnutrition among children.
- Also consistent with the descriptive results in Chapter 4, despite Borena's lower calorie consumption than Jijiga, it is doing better than Jijiga when it comes to dietary diversity. Borena households are more likely to experience overall food insecurity, but less likely to experience hunger. Borena is doing worse than Jijiga in acute child malnutrition, however.
- Agro-pastoralists consistently do better in terms of food security than the other groups, eating more food (calories), having better dietary diversity, and experiencing less hunger.

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<sup>75</sup> Plantain bananas.

**Table 7-1. Regression Analysis: Relationship Between Well-being Outcomes and Shock Exposure**

	Food Security (Consumption Indicators)			Food Insecurity (Experiential Indicators)				Child Nutritional Status (< 5 yrs.)
	Per Capita Calorie Consumption		Dietary Diversity Score	HFIAS <sup>a/</sup>		Household Hunger Scale	Weight-for-Height Z-Score	
<b>Shock exposure</b>	-1.3		0.010 **	0.225 ***		0.031 ***	-0.002	
Adult equivalents	-415.9 ***		-0.184 *	0.385		0.023	-0.061	
AE-squared	25.3 ***		0.013	-0.024		-0.002	0.005	
Percent males 0-16 b/								
Males 16-30	10.1 ***		-0.004	-0.015		0.000	-0.003	
Males 30 plus	5.8 ***		-0.007 *	-0.003		-0.002	0.001	
Females 0-16	-1.9		0.005 **	-0.005		-0.001	0.001	
Females 16-30	3.5 *		0.009 ***	-0.025 ***		-0.005 **	-0.007	
Females 30 plus	4.7 **		0.006 **	0.003		-0.001	-0.018 **	
Education: None b/								
Primary	104.8 **		0.097	0.269 ***		-0.077 *	0.173	
Secondary	258.0 ***		0.364 **	0.460 **		-0.142 *	0.372 **	
Female-adult-only hh	136.8		-0.152	0.653		0.102	-0.191	
Non-pastoralist b/								
Agro-pastoralist	214.6 ***		0.444 ***	-0.256		-0.187 **	-0.020	
Pastoralist	29.5		0.070	-0.424		-0.125	-0.051	
Asset index	27.2 ***		0.056 ***	-0.189 ***		-0.024 ***	-0.016	
Regional effect								
Borena (vs. Jijiga)	-654.7 ***		0.805 ***	0.918 *		-0.309 ***	-1.350 ***	
Number of observations	3,019		2,948	2,885		2,957	2,469	
R-squared	0.26		0.22	0.25		0.21	0.19	

**Notes:** Community (kebele) fixed-effects regression. t-statistics are robust to heteroskedasticity.

Stars represent statistical significance at the 10 (\*), 5(\*\*) and 1(\*\*\*) percent levels.

a/ Household food insecurity access scale.

b/ Reference category.

- When at least one member in a household has a secondary education, children under 5 can be expected to have better nutritional status. When at least one *female* member in a household has a secondary education, the effect is even stronger (result not shown). This result, in addition to the lack of impact of asset ownership, downplays the role of food security and points to the possibility that the quality of caring practices for young children (e.g., breastfeeding and weaning practices, care during illness, protection from pathogens) is an important determinant of nutritional status in the PRIME IE area.<sup>76</sup>

<sup>76</sup> See Smith, Ramakrishnan, Ndiaye, Haddad, and Martorell (2003) for evidence on the positive relationship between education and child nutritional status.

## 7.2 Links Between Well-Being Outcomes and Resilience Capacity

This section presents regression results examining the relationship between resilience capacity—measured as an overall index made up of absorptive capacity, adaptive capacity, and transformative capacity (see Chapter 6)—and household food security (see Table 7-2). The results indicate that resilience capacity has a positive impact on household food security. Greater resilience capacity is associated with higher calorie consumption, higher dietary diversity, lower food insecurity overall, and less hunger. Probit regression results (not shown) confirm that higher resilience capacity is associated with a lower probability of a household experiencing hunger. The data indicate that going for a full day and night without eating is the behavior signaling hunger that resilience capacity reduces the most.<sup>77</sup>

All the results on the relationship between resilience capacity and food security outcomes are strongly statistically significant ( $p < 0.01$ ). Of note is that the results are coming through even after controlling for household wealth (the asset index).<sup>78</sup> They are thus suggestive that resilience capacity has a positive influence on food security *above and beyond* households' economic status. This is an important finding, because household resilience capacity and household wealth are positively correlated,<sup>79</sup> and if wealth is not controlled for, resilience capacity would appear to have a stronger impact than it actually does.

The regression results imply a quite strong relationship between resilience capacity and the food security outcomes. For example, they indicate that a 10-point increase in the resilience capacity index would lead to an increase in per capita calorie consumption of 130 kcals (a 6 percent increase over the population mean). The same increase would lead to a reduction in the HHS of 0.10, which corresponds to a nine percentage-point reduction in the prevalence of hunger.<sup>80</sup>

Household resilience capacity appears to have no influence on acute child nutritional status, as indicated by a non-significant coefficient on the weight-for-height Z-score among children under 5.

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<sup>77</sup> The coefficients for the other two behaviors (having no food in the house and going to bed hungry because there is not enough food) are also statistically significant.

<sup>78</sup> The coefficients on the resilience capacity index and their statistical significance are very similar when per capita total expenditures is controlled for rather than the asset index.

<sup>79</sup> The correlation between the household resilience capacity index and the asset index is 0.38 ( $p = 0.000$ ).

<sup>80</sup> This estimate is derived from the probit regression coefficient on the resilience capacity index (-0.009).

**Table 7-2. Regression Analysis: Relationship Between Well-Being Outcomes and Household Resilience Capacity**

	Food Security (Consumption Indicators)				Food Insecurity (Experiential Indicators)				Child Nutritional Status (< 5 yrs.)
	Per Capita Calorie Consump- -tion		Dietary Diversity Score		HFIAS a/		House- hold Hunger Scale		Weight-for- Height Z-Score
<b>Resilience capacity</b>	158.6	***	0.0255	***	-1.334	***	-0.115	***	0.038
Adult equivalents	-402.7	***	-0.124		0.322		0.019		-0.099
AE-squared	23.9	***	0.007		-0.013		-0.002		0.007
Percent males 0-16 b/									
Males 16-30	11.5	***	-0.002		-0.028	**	-0.001	*	0.000
Males 30 plus	8.0	***	-0.005		-0.013		-0.003		0.003
Females 0-16	-2.0		0.004		-0.011		-0.001		0.002
Females 16-30	2.4		0.008	**	-0.017		-0.004	*	-0.011
Females 30 plus	4.6	**	0.005		0.004		0.001		-0.019 ***
Education: None b/									
Primary	77.1		0.049		-0.489		-0.019		0.243 **
Secondary	223.7	**	0.344	**	-1.025	**	-0.144	*	0.407 **
Female-adult-only hh	2141.1	**	-0.120		-0.012		0.082		-0.101
Non-pastoralist b/									
Agro-pastoralist	175.8	***	0.450	***	0.534		-0.061		-0.020
Pastoralist	-25.2		-0.010		0.823	*	0.058		-0.101
Asset index	21.2	***	0.044	***	-0.112	***	-0.013	***	-0.013
Regional effect									
Borena (vs. Jijiga)	-807.5	***	0.378	**	1.770	**	-0.342	***	-1.430 ***
Number of observations	2,754		2,696		2,640		2,709		2,235
R-squared	0.27		0.23		0.20		0.17		0.19

**NOTES:** Community (*kebele*) fixed-effects regression. *t*-statistics are robust to heteroskedasticity.

Stars represent statistical significance at the 10 (\*), 5(\*\*) and 1(\*\*\*) percent levels.

a/ Household food insecurity access scale.

b/ Reference category.

Table 7-3 reports the results individually for absorptive capacity, adaptive capacity, and transformative capacity. Like the results for overall index of resilience capacity, they suggest that all of these aspects of resilience are positively associated with food security and that there is no association between them and acute child nutritional status. Because the indexes of these concepts are all measured on the same scale (from 0 to 100), comparisons of their coefficients gives an indication of their relative strengths of impact on the well-being outcome indicators. Transformative capacity has a stronger impact than adaptive capacity, and adaptive capacity a stronger impact than absorptive capacity for all of the food security indicators except the HHS. This makes sense because absorptive capacity is about households coping with shocks in the short term, adaptive capacity is about households taking proactive decisions to deal with shocks (decisions that are likely to have a broader, more sustainable impact), and transformative capacity is about creating an enabling environment for resilience that is widely applicable to all households in an area.

**Table 7-3. Regression Analysis: Relationship Between Well-Being Outcomes and Household Absorptive, Adaptive, and Transformative Resilience Capacity**

	Food Security (Consumption Indicators)				Food Insecurity (Experiential Indicators)				Child Nutritional Status (< 5 yrs.)
	Per Capita Calorie Consumption		Dietary Diversity Score		HFIAS <i>a/</i>		Household Survey		Weight-for- Height Z-Score
<b>Absorptive capacity</b>	5.8	***	0.006	**	-0.070	***	-0.009	***	0.002
No. of observations	2,963		2,901		2,843		2,915		2,410
R-squared	0.26		0.23		0.19		0.18		0.19
<b>Adaptive capacity</b>	10.6	***	0.020	***	-0.089	***	-0.006	***	0.003
No. of observations	2,997		2,936		2,874		2,947		2,440
R-squared	0.28		0.24		0.19		0.16		0.18
<b>Transformative capacity</b>	14.3	***	0.025	***	-0.120	***	-0.009	***	0.003
No. of observations	2,851		2,789		2,730		2,801		2,321
R-squared	0.27		0.24		0.19		0.16		0.19

**NOTES:** Community (*kebele*) fixed-effects regression. *t*-statistics are robust to heteroskedasticity.

All independent variables controlled for are listed in Table 7-1.

Stars represent statistical significance at the 10 (\*), 5(\*\*) and 1(\*\*\*) percent levels.

*a/* Household food insecurity access scale.

The results for community resilience capacity are presented in Table 7-4. They suggest that while community resilience capacity does not assist households in avoiding the less extreme forms of food insecurity, it does play a role in helping them to avoid hunger. They indicate that greater community resilience capacity reduces the incidence of all three behaviors associated with hunger (results not shown) and, as for household resilience capacity, has its strongest influence by reducing the behavior of going for a full day and night without eating. Again, these results hold even after controlling for household wealth. It should be kept in mind that one reason why community resilience as measured here may not show an impact for the HFIAS overall is because it is so low in the PRIME IE area (see Section 6.10).

**Table 7-4. Regression Analysis: Relationship Between Well-Being Outcomes and Community Resilience Capacity**

	Food Security (Consumption Indicators)			Food Insecurity (Experiential Indicators)			Child Nutritional Status (< 5 yrs.)	
	Per Capita Calorie Consump- tion		Dietary Diver- sity Score	HFIAS <sup>a/</sup>		Household Hunger Scale	Weight- for- Height Z-Score	
<b>Community resilience capacity</b>	-4.3	*	0.006	-0.024		-0.007	**	0.004
Adult equivalents	-435.0	***	-0.176	0.706	**	0.086		-0.102
AE-squared	28.4	***	0.014	-0.048		-0.007		0.013
Percent males 0-16								
Males 16-30	10.1	***	-0.004	-0.020	*	-0.001		-0.003
Males 30 plus	6.3	***	-0.006	-0.003		-0.002		0.003
Females 0-16	-2.1		0.005	-0.006		-0.001		0.001
Females 16-30	-2.8		0.011	-0.013		-0.004	*	-0.007
Females 30 plus	5.2	**	0.008	0.013		0.002		-0.022
Education: None								
Primary	73.6		0.118	-0.792	**	-0.084	*	0.110
Secondary	173.1	**	0.388	-1.031	*	-0.167	**	0.240
Female-adult-only hh	70.3		-0.097	0.228		0.104		-0.027
Non-pastoralist b/								
Agro-pastoralist	195.9	***	0.359	0.094		-0.135	*	-0.115
Pastoralist	-86.3		0.099	0.265		-0.013		-0.012
Asset index	27.2	***	0.060	-0.182	***	-0.024	***	-0.011
Regional effect								
Borena (vs. Jijiga)	-421.6	***	0.486	1.315		-0.090		-1.574
Number of observations	3058		2985	2920		2994		2486
R-squared	0.20		0.14	0.06		0.09		0.13

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

<sup>a/</sup> Household food insecurity access scale.

### 7.3 Does Greater Household Resilience Capacity Reduce the Negative Impact of Shocks on Well-Being Outcomes?

To answer this question, we include shock exposure and household resilience capacity in the same regression equation and look at their interaction (shock exposure multiplied by resilience capacity). The coefficient of this interaction term being statistically significant suggests that resilience capacity somehow alters the impact of shock exposure on households.

As can be seen in Table 7-5 below, the interaction term is statistically significant for both the HFIAS and the HHS.<sup>81</sup> For the former, it implies the following relationship between shock exposure (SE), resilience capacity (RC), and household food insecurity:

$$HFIAS = -0.051 * RC + 0.459 * SE - 0.005 * RC * SE.$$

Therefore, the estimated impact of SE on food insecurity is:

$$\frac{\partial HFIAS}{\partial SE} = 0.459 - 0.005 * RC.$$

This result implies that shock exposure increases food *in*security, but less so the higher is a household's resilience capacity. The similar equations for the HHS are:

$$HHS = 0.005 * RC + 0.083 * SE - 0.001 * RC * SE,$$

$$\frac{\partial HHS}{\partial SE} = 0.083 - 0.001 * RC.$$

In this case it appears that (given the low significance of the coefficient on RC (p=0.098)) the impact of shock exposure may be mediated entirely by its resilience capacity.

**Table 7-5. Regression Analysis: Does Greater Resilience Capacity Reduce the Negative Impact of Shocks on Well-Being Outcomes?**

	Food Security (Consumption Indicators)		Food Insecurity (Experiential Indicators)		Child Nutritional Status (< 5 yrs.) Weight-for- Height Z-Score		
	Per-Capita Calorie Consump- tion	Dietary Diversity Score	HFIAS <i>a/</i>	Household Survey			
Household resilience capacity	13.1	***	0.022	-0.051	***	0.005	0.001
Shock exposure	-1.3		0.012	0.459	***	0.083	-0.007
<b>Resilience capacity*Shock exposure</b>	-0.007		0.000	-0.005	***	-0.001	0.000
Number of observations	2696	2640	2591			2657	2204
R-squared	0.27	0.23	0.30			0.24	0.20

**NOTES:** Community (*kebele*) fixed-effects regression. *t*-statistics are robust to heteroskedasticity.

All independent variables controlled for are listed in Table 7-1.

Stars represent statistical significance at the 10 (\*), 5(\*\*) and 1(\*\*\*) percent levels.

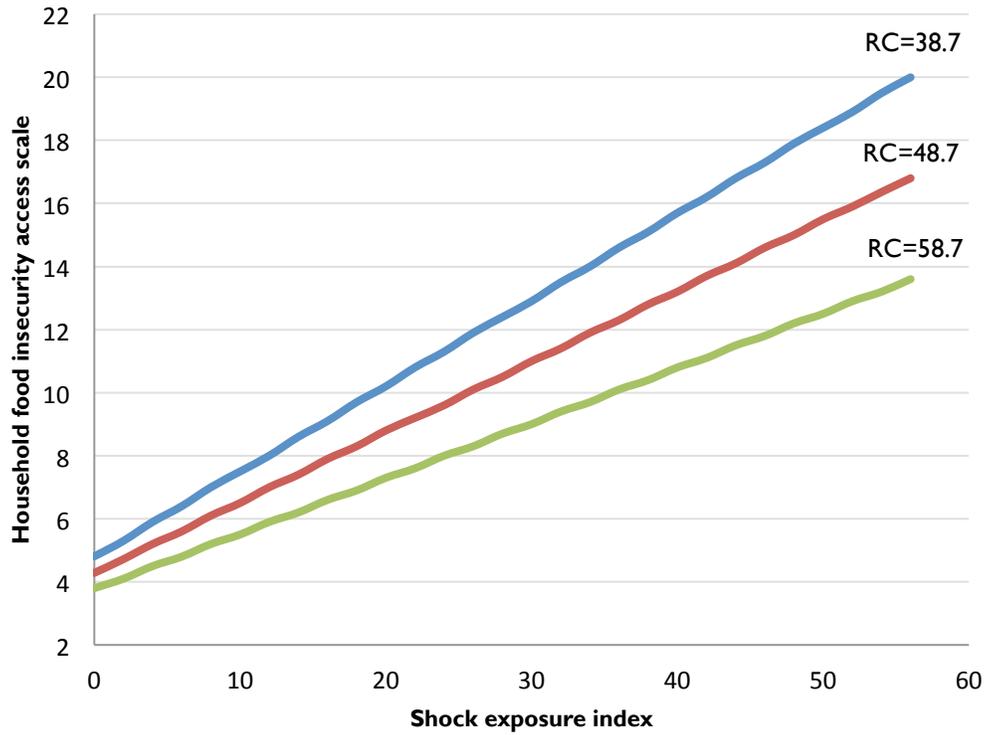
*a/* Household food insecurity access scale.

Figure 7-1 illustrates the resilience capacity-mediated relationship between shock exposure and household food insecurity implied by the regression results in Table 7-5. It shows the implied impact of shock exposure on the HFIAS at three values of the resilience capacity index: the mean (48.7), the mean minus 10 points, and the mean plus 10 points. The slope of the line is smaller the higher is the

<sup>81</sup> The results for the other independent variables controlled for (listed in Table 7-1) are not shown.

level of resilience capacity. Further, any given level of shock exposure (e.g., 30) is associated with a lower level of food insecurity the higher is resilience capacity.

**Figure 7-1. Resilience Capacity-Mediated Relationship Between Shock Exposure and Household Food Insecurity**



***SUMMARY: Links Between Shock Exposure, Resilience Capacities, and Well-Being Outcomes***

Multivariate regression analysis is used to examine the relationships between shock exposure, both household and community resilience capacities, and key well-being outcomes of interest for the PRIME project: household food security and child nutritional status. Both quantitative indicators of food security (household per capita calorie consumption and dietary diversity) and experiential indicators (the HFIAS and the HHS) are employed. The indicator of child nutritional status is the weight-for-height Z-score of children under 5, measuring acute nutritional status (wasting).

The regression results for the experiential food security indicators clearly indicate that shock exposure is associated with higher food insecurity, including its most extreme form, hunger. Though shock exposure has no association with calorie consumption, it is associated with higher dietary diversity. Some of the foods that are more likely to be eaten in the face of increased shock exposure (vegetables, eggs, milk and milk products) have high micronutrient and protein content as a group, a positive sign that some households' dietary quality is protected during times of stress.

The regression results also confirm that the stronger is household resilience capacity—including absorptive capacity, adaptive capacity, and transformative capacity—the higher food security is likely to be. Households with greater resilience are likely to have greater food consumption, higher dietary diversity, reduced food insecurity overall (as measured using the HFIAS), and reduced hunger. These results are highly statistically significant and hold even after controlling for household wealth. The results imply that, in general, transformative capacity has a greater impact on food security than adaptive capacity, and adaptive capacity a greater impact than absorptive capacity. They support a positive role for household resilience in assisting households to withstand and recover from shocks. Shock exposure is associated with higher food insecurity and hunger, but its implied negative impact is reduced the higher is a households' resilience capacity.

The regression results for community resilience suggest that while it does not appear to assist households in avoiding the less extreme forms of food insecurity, it does play a role in helping them to avoid hunger.

Shock exposure and resilience are not found to have any association with acute child nutritional status. The regression results indicate that wealth, which is strongly associated with food security, also has no impact on child nutritional status, but that education, especially for women, does. These results point to the possibility that the quality of caring practices for young children is an important determinant of nutritional status in the PRIME IE area.

Overall, the regression results bear out the hypothesized relationships between shock exposure, resilience capacity, and household food security, a key well-being outcome. Shock exposure reduces household food security. Resilience capacity bolsters it and helps to reduce the negative impacts of shocks on it.

## Chapter 8. Conclusion: Key Findings and Next Steps

This report presents findings from the Ethiopia PRIME IE baseline survey. The following tasks were undertaken in the report. First, it described the livelihood environment of households in the evaluation area. Second, it provided baseline estimates of the key indicators of household well-being outcomes, shock exposure and resilience capacities. Third, it explored baseline differences in indicators across the two IE geographical areas (Borena and Jijiga) and three pastoralist status groups (pastoralists, agro-pastoralists and non-pastoralists). Baseline differences across the IE comparison groups (low intervention intensity and high intervention intensity) were also calculated to help measure PRIME project impact. Fourth, the report used multivariate regression to examine the relationships among household outcomes, shock exposure, and resilience capacities in the PRIME IE area.

### Key Findings

- The baseline household survey data confirm that the PRIME IE area is dominated by pastoralists and agro-pastoralists. However, non-pastoralists make up a large proportion of households (24 percent). Pastoralism is more prevalent in Borena than Jijiga; agro- and non-pastoralism are more prevalent in Jijiga. The main sources of food and income are farming and livestock rearing; wage labor and salaried work are important sources only among non-pastoralists.
- The prevalence of poverty as measured using per capita total expenditures, and the \$1.25 per day poverty line in the PRIME IE area is 56.3 percent. It is more than three times higher in Borena than in Jijiga. However, as the report's analysis confirms, asset poverty is a more useful measure of economic well-being in this pastoralist-dominated setting. Many households likely gain income and buffer themselves against shocks through asset protection and accumulation, perhaps even at the expense of current consumption. By the measure of asset poverty, which is an indicator of long-term, structural poverty, a greater percent of households in Jijiga live in poverty than in Borena.
- With respect to food security, undernourishment is high in the IE area: Nearly half of the population does not eat enough food (calories) for an active, healthy life. Dietary quality is also very poor. Undernourishment is far higher in Borena than Jijiga, yet dietary quality is worse in Jijiga. By the HFIAS, an experiential measure of food insecurity, over 75 percent of households are food insecure, with Jijiga experiencing higher levels of hunger, the most extreme form of food insecurity. Among the pastoralist status groups, despite having the lowest prevalence of undernourishment, non-pastoralists have the lowest diet quality and do the poorest on all experiential measures of food insecurity.
- The prevalence of wasting among children under 5 is 12.2 percent in the PRIME IE area. It is more than twice as high in Borena as in Jijiga, and most prevalent among pastoralists. Wasting is stubbornly unrelated to poverty, shock exposure, and resilience. The fact that it does appear to be reduced with higher education levels among

household adults, especially higher female education, points to the possibility that the quality of caring practices for young children (e.g., breastfeeding and weaning practices, care during illness, protection from pathogens) is an important driver of wasting in the IE area.

- The IE area is highly shock-prone: Over 85 percent of households experienced a shock in the year prior to the baseline survey. The most common shock was a sharp increase in food prices, followed by livestock and crop disease, drought, poor harvests, and increased prices of agricultural or livestock inputs. Focus group participants agreed that shocks are becoming more frequent; they underlie an increase in localized conflict between different groups that live in close proximity to one another. Conflict over pasture and water is a long-standing issue, but is exacerbated during severe or sustained drought. Households in Jijiga are more shock exposed overall than households in Borena. Though there are some differences by type of shock, shock exposure does not differ across the pastoralist, agro-pastoralist, and non-pastoralist groups.
- With respect to resilience capacity, the psychosocial capabilities of aspirations and confidence to adapt that give people greater resilience in the face of shocks show little difference across the two IE areas or the pastoralist status groups. However, all three types of social capital—bonding, bridging, and linking—are stronger in Borena than Jijiga. They are also stronger for pastoralists than agro- and non-pastoralists.
- Livelihood diversity, which is also thought to bolster households’ resilience to shocks, is higher in Borena than Jijiga. It is highest among agro-pastoralists and lowest among non-pastoralists. Levels of ownership of productive assets, access to markets, services, infrastructure, and information are generally low throughout the IE area. They are higher for households in Borena than Jijiga, however, and lowest among non-pastoralists.
- Summary measures of the three capacities on which resilience is built—absorptive capacity, adaptive capacity, and transformative capacity—show that, overall, Borena households are more resilient in general than Jijiga households. Pastoralists are more resilient than agro-pastoralists, and agro-pastoralists in turn more resilient than non-pastoralists.
- Community resilience—the capacity of communities to use collective action to absorb change, seize opportunity to improve living standards, and transform livelihood systems—is similarly higher in Borena than Jijiga. Collective action is low in both regions, however.
- Qualitative FG discussions reveal that women are highly vulnerable in terms of their property rights and access to assets and information, yet contribute a great deal to their households and communities in terms of family and social support. Women still lag far behind men in access to opportunities for income and education. However, importantly, in FG discussions women indicated that as a result of increased information and services, particularly from NGOs, they have aspirations to attain more of both, and that this will help them contribute more to solving problems in their community. Women

also voiced a desire for expanded infrastructure services in health, water, and education, as they realize this will enhance the well-being of their families.

- The multivariate regression results clearly indicate that shock exposure is associated with higher food insecurity, including hunger. They also confirm that higher household resilience capacity, including absorptive capacity, adaptive capacity, and transformative capacity, promotes better food security. Households with greater resilience are likely to have higher food consumption, higher dietary diversity, reduced food insecurity overall (as measured using the HFIAS), and reduced hunger. These results are strongly statistically significant and hold even after controlling for asset poverty. In general, transformative capacity has a stronger positive association with food security than adaptive capacity, and adaptive capacity a stronger association than absorptive capacity.
- The regression results support a positive role for household resilience in assisting households to withstand and recover from shocks: Shock exposure increases food insecurity and hunger, but its negative influence is reduced the higher is a household's resilience capacity.
- Community resilience does not appear to aid households in avoiding the less extreme forms of food insecurity; however, the data imply that it does play a role in helping them to avoid hunger. The limited influence of community resilience found is probably due to the fact that the strength of collective action is relatively low. It should improve as a result of PRIME interventions.

In conclusion, it appears that resilience is higher in Borena than Jijiga, and higher among pastoralists than agro-pastoralists and non-pastoralists. However the baseline survey shows that all these groups of households are highly food insecure and vulnerable to multiple types of shocks and stresses. Household and community resilience needs to be strengthened to avoid further deprivation due to such disturbances. The PRIME project has been designed to strengthen the capacities of households and communities to manage future shocks and stresses. Follow-up surveys will be designed to capture changes in resilience capacity over the life of the project and evaluate its impact on resilience capacities and well-being outcomes.

## Next Steps

In the next step in this evaluation of the PRIME project, Feed the Future FEEDBACK will set up an interim monitoring system to capture real-time household and community responses to shocks and stresses as they occur over the next four years. Information related to shocks and stresses will be collected such as climate variables (rainfall), price levels, animal disease levels, and conflict. This effort will be coordinated with the Ethiopian government, UN organizations, and the Famine Early Warning Systems Network. Trigger thresholds will be identified to determine when shocks and major stressor points have occurred in sentinel sites in the IE areas; these will be used to determine when follow-up survey activities will be carried out with panel households. Following a shock or major stressor, quantitative and qualitative data collection activities using short survey instruments and topical outlines will be carried out every 2 weeks over a 6-month period. The main focus of these interim monitoring activities is to assess household and community capacity to manage risk.

The PRIME IE endline survey will take place near the end of project activities, in approximately 5 years (2016/2017). Data will be collected from the same households and communities as those surveyed for the baseline to enable an empirically valid evaluation of the impact of the PRIME project on household resilience and well-being outcomes.

### ***Areas for Additional Research***

The quantitative data analysis revealed two areas in need of additional research:

1. What causes wasting among children under 5 in the IE area? The data reveal that neither shock exposure nor poverty nor resilience capacity are associated with wasting, but suggest that the quality of caring practices for children may be a key issue.
2. Why is dietary quality, as measured by an indicator of dietary diversity, higher among households that are more exposed to shocks? How do households' coping strategies with regard to food choice assist them in dealing with shocks?

## Appendix I. Calculation of Measures of Resilience

Below, we explain the calculation of the indexes used to measure resilience. The question numbers from the household and community questionnaires used for each index are listed after the explanation of its calculation. Questions from the household questionnaire are preceded by “hh” and questions from the community questionnaire preceded by “cm.”<sup>82</sup> Table A-1 contains descriptive statistics for each of the indexes.

**Table A-1. Descriptive Statistics for Resilience Capacity Indicators**

	Mean	Standard Deviation	Minimum	Maximum
Index of perceived ability to recover from shocks	2.3	0.91	0.82	4.99
Index of aspirations and confidence to adapt	28.9	14	0	100
Index of bonding social capital	63.1	34.53	0	100
Index of bridging social capital	46.4	34.67	0	100
Index of linking social capital	41.9	18.04	0	100
Index of absorptive capacity	58.8	24.23	0	100
Index of adaptive capacity	46.1	18.57	0	100
Index of transformative capacity	46.8	17.2	0	100
Index of household resilience capacity	49.2	18.36	0	100
Index of community resilience	43.8	30.81	0	100

### AI.1 Index of Perceived Ability to Recover from Shocks

The index is based on estimation of the ability of households to recover from the typical types of shocks that occur in the PRIME IE area based on data on the shocks households experienced in the year prior to the survey. Since each survey household did not experience the same types of shocks of the same severity, it was necessary to create a “shock exposure corrected” index to measure ability to recover.

First, a measure of shock exposure was created that takes into account the number of shocks (out of 18) experienced and their severity. Severity is measured using respondents’ answers to the question, asked of each shock experienced, “How severe was the impact on your income and food consumption?” The possible responses were:

1. None
2. Slight impact
3. Moderate impact
4. Strong impact
5. Worst ever happened

<sup>82</sup> For the indexes based on factor analysis, scoring coefficients for all index components are positive (i.e., the correlation between all index components and the index itself is positive). Any component that is found to enter negatively is dropped from the index.

The shock exposure measure is then a weighted average of the incidence of experience of each shock (a variable equal to one 1 if it was experienced and 0 otherwise), multiplied by the perceived severity of the shock. The shock exposure index ranges from 1 to 57.

Next, a base “perceived ability to recover” index was calculated based on responses to the following question: “To what extent were you and your household able to recover?” The possible responses were:

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

The index is the mean value of respondents’ responses to the question across all of the shocks experienced.

Finally, a “shock exposure corrected” index was calculated to create a measure of ability to recover. The index is based on the assumption that households experienced the same shock exposure and is therefore comparable across them. To do so, a linear regression of the base ability-to-recover (ATR) index on the shock exposure index was run, yielding the amount by which an increase of 1 in the shock exposure index can be expected to change the ability to recover index. The estimated empirical equation is:

$$ATR = 2.36 - 0.014 * shock\_exposure.$$

As expected, the higher the shock exposure, the lower is the ability to recover (the coefficient on shock exposure is negative). Next, the corrected recovery index was calculated as:

$$ATR\_corrected = ATR - 0.014 * (13.7 - shock\_exposure),$$

where 13.7 is the mean of the shock exposure index. As such, the ATR index value of a household with shock exposure below the mean would have a downward adjustment of its value and the opposite for a household with a shock exposure above the mean.

### **Survey questions: hh301, hh303, hh305, hh306.**

Thirteen percent (n=433) of the households in the sample did not experience any shock in the last year. Therefore, an ability to recover index value could not be estimated for them in this way. The index value for these households was predicted using Ordinary Least Squares regression, with the following predictors:

- Number of household adult equivalents
- Age-sex composition of the household (percent of members in three age-sex groups)
- Whether the household is a “female adult only” household
- Educational status of adult household members

- Whether the household is asset poor
- The pastoralist status of the household
- Whether the household is in Borena or Jijiga

## AI.2 Index of Aspirations and Confidence to Adapt

This index is based on indicators of three underlying concepts:

- **Absence of fatalism.** The absence of the sense of being powerless to enact change and that one has no control over life’s events.
- **Sense of individual power.** A sense of having power to enact change as an individual rather than being subject to the decisions of more powerful people.
- **Exposure to alternatives to the status quo.** The degree to which a person has been exposed to alternative ways of life than one’s own.

The concepts are measured using the answers to subjective and objective questions asked of household survey respondents that fall into three categories:

1. Yes/no questions regarding whether or not people agree with certain viewpoints or engage in certain behaviors.
2. Questions about the number of times in the previous month the respondent engaged in various behaviors.
3. A series of statements about which respondents were asked to tell whether they “strongly agree,” “disagree,” “slightly disagree,” “slightly agree,” “agree,” or “strongly agree.” Responses to these statements can be put on a “6-point agreement scale.”

Respondents’ responses are used to calculate indexes, one for each of the three concepts.

The **absence of fatalism** index is based on four variables: two yes/no questions, one regarding the degree to which respondents agree that each person is responsible for his/her own success or failure in life and one regarding the degree to which a person can rely on luck rather than hard work to be successful. The second two correspond to the following 6-point agreement scale statements:

- My experience in my life has been that what is going to happen will happen.
- It is not always wise for me to plan too far ahead because many things turn out to be a matter of good or bad fortune.

### Survey questions: hh1901, hh1902, hh1911, hh1913.

The **individual power** index is based on six variables: one yes/no question regarding whether a person is willing to move somewhere else to improve his/her life and the others based on binary variables constructed from the 6-point agreement scale statements:

- I feel like what happens in my life is mostly determined by powerful peoples.
- My life is chiefly controlled by other powerful people.
- I can mostly determine what will happen in my life.

- When I get what I want, it is usually because I worked hard for it.
- My life is determined by my own actions.

**Survey questions: hh1903, hh1910, hh1912, hh1914, hh1915, hh1916.**

The **exposure to alternatives** index is based on five questions. Two are yes/no questions regarding communications with people outside of one’s community and engagement in economic activities with members of other clans. The remaining three are based on the answers to the questions:

- How many times in the past month have you got together with people to have food or drinks, either in their home or in a public place?
- How many times in the past month have you attended a church/mosque or other religious service?
- How many times in the past month have you stayed more than two days outside this *kebele*?

**Survey questions: hh1905, hh1906, hh1907, hh1908, hh1909.**

Polychoric PCA is used to calculate the indexes because all are based on either binary variables or a combination of binary and ordinal variables. All indexes are placed on a 0-100 scale in order to enable cross-index comparisons. The final overall index of aspirations and confidence to adapt is calculated using PCA.

### **AI.3 Indexes of Bonding, Bridging, and Linking Social Capital**

The **bonding social capital** index is based on eight yes/no questions:

- Two asking whether the household would be able to get help from relatives in their community
- Two asking whether the household would be able to get help from non-relatives in their community
- Two asking whether the household would be able to give help to relatives within the community
- Two asking whether the household would be able to give help to non-relatives within the community

**Survey questions: hh1805, hh1807, hh1810, hh1812, hh1816, hh1818, hh1821, hh1823.**

The **bridging social capital** index is also based on eight yes/no questions, but each is asked with regard to relatives or non-relatives living *outside* of their community.

## Survey questions: hh1806, hh1808, hh1811, hh1813, hh1817, hh1819, hh1822.

The **linking social capital** index measures the amount of information received from two types of government agents, rural development agents and government (political) officials; and households' access to services that are generally provided by the government and the quality of those services, including access routes (roads, trails), health services, facilities for veterinary services, and agricultural extension services.<sup>83</sup>

To measure information received, household survey respondents' data were used regarding how many topics households have received information about (out of a possible 13) from either a rural development agent or a government official in the last year. Data from the community survey were used to measure access to and quality of services.

*Quality of roads/trails.* A household was considered to have access to a good-quality road/trail used as a main route to reach the community in which it resides, and if the road/trail could be used for travel throughout the year (i.e., people are not prevented from traveling due to “poor road/trail conditions”).

*Quality of health services.* A 4-point quality scale was constructed as follows:

- No health center within 5 km (scale=0).
- There is a health center within 5 km, but its physical condition is classified as “poor” or “very poor,” *or* there was a time in the last year when people needed health services but could not get them from the health center because of quality problems<sup>84</sup> (scale=1).
- There is a health center within 5 km and either the physical condition is not good or there are quality problems (but not both) (scale=2).
- There is a health center within 5 km and its physical condition is good and there are no quality problems (scale=3).

*Quality of facility for veterinary services.* A 4-point quality scale was constructed using the same criteria as for the quality of health services.<sup>85</sup>

*Quality of agricultural extension services.* A 3-point quality scale was constructed as follows:

- No agricultural extension services provided (scale=0).
- Agricultural extension services are provided, but there was a time in the last year when people needed health services but could not get them from the health center because of quality problems<sup>86</sup> (scale=1).

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<sup>83</sup> The availability and quality of schools was also assessed, but results did not correlate positively with the other measured aspects of linking social capital. Therefore, it was not included in the index.

<sup>84</sup> These problems could be no beds, health center was full; no staff in the health center; health center was destroyed/burnt; no drugs at the health center; quality of the health service is very poor.

<sup>85</sup> The quality problems could be no staff in the veterinary center; veterinary center too busy; veterinary center was destroyed/burnt; no equipment/drugs at the veterinary center; quality of the services is poor.

- Agricultural extension services are provided, and there were no quality problems cited in the last year (scale=2).

**Survey questions: hhl401, hhl402, cm314, cm320, cm324, cm323, cm330, cm331, cm334, cm335, cm336, cm337, cm338, cm339, cm343, cm344, cm345.**

Principal component analysis is used for calculating the bonding and bridging social capital indexes (polychoric was not used because the original matrix of correlations was not positive semi-definite, and when the matrix is forced to be positive semi-definite, zero scoring coefficients for some input variables results). Polychoric is used for linking social capital because some variables are ordinal.

All indexes are placed on a 0-100 scale to enable cross-index comparisons. Because the social capital indexes are used further in calculating the resilience capacity indexes, missing values were predicted using Ordinary Least Squares regression and the same independent variables as those used for predictions of the perceived ability to recover index (see Section 1.1). The number of households for which the indexes are predicted is 218 for bonding social capital, 221 for bridging social capital, and 47 for linking social capital.

## AI.4 Index of Absorptive Capacity

The index of absorptive capacity is constructed from seven indicators, some of which are themselves indexes based on primary data collected in the household or community survey. The indicators and explanations of their calculation are:<sup>87</sup>

1. **Informal safety nets.** This indicator is the number of community organizations providing safety nets that are available in each household's community. The eight organizations are:
  - Credit or micro-finance group
  - Savings group
  - Zakat
  - Mutual help group (including burial societies)
  - Civic (“improving community”) group
  - Charitable group (“helping others”)
  - Religious group
  - Women’s group
2. **Shock preparedness and mitigation.** Binary (dummy) variable equal to 1 if the household lives in a community with a government disaster planning and/or response

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<sup>86</sup> The problems could be no beds, health center was full; no staff in the health center; health center was destroyed/burnt; no drugs at the health center; quality of the health service is very poor.

<sup>87</sup> One calculated variable, presence of a conflict mitigation group in the household's community, could not be included because of lack of sufficient variation in the data for calculating correlation coefficients needed to apply polychoric factor analysis.

program; an NGO disaster planning and/or response program; a community disaster planning group; or an emergency plan for livestock offtake if a drought hits.

**Survey questions: cm502\_5, cm502\_6 cm504\_5, cm504\_6, cm401, cm350.**

3. **Hazard insurance.** A binary (dummy) variable equal to one if the household lives in a community with institutions where people can receive assistance due to losses of livestock.

**Survey question: cm368.**

4. **Household perceived ability to recover.** See Section 1.1.
5. **Bonding social capital.** See Section 1.3.
6. **Whether a household currently holds savings.**

**Survey question: hh1301.**

7. **Asset ownership.** Asset ownership is measured based on three categories of assets: ownership of consumer durables, ownership of agricultural productive assets, and ownership of animals. Consumer durables ownership is measured as the number of consumption assets owned out of a total of 11. Ownership of agricultural productive assets is measured as the number of productive implements owned out of 22. Animal ownership is measured in TLUs, as defined in Chapter 3. An overall asset index is constructed from the three measures using PCA.

The indicators were combined into an index using polychoric factor analysis.

## **AI.5 Index of Adaptive Capacity**

The index of adaptive capacity is constructed from eight indicators. Again, some of these are themselves indexes based on primary data collected in the household or community survey. The indicators and explanations of their calculation are:

1. **Access to financial resources.** The variable is equal to 0 if there is no institution in a household's community providing credit or savings support; it is equal to 1 if there is only one, and 2 if there are institutions that provide both types of support.

**Survey questions: cm360, cm401\_d, cm401\_e.**

2. **Human capital.** The variable is based on an index calculated from three variables.<sup>88</sup> The first is whether or not any adults in the household can read or write, a binary variable. The second is whether any household adults have a primary or higher education, also a binary variable. The third is the number of trainings the respondent or

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<sup>88</sup> A third variable—whether the household has a member with a disability—could not be included because a correlation with the education variable, which is needed for polychoric PCA, could not be calculated.

any other household member has had [vocation (job) training, business development training, NRM training, adult education (literacy or numeracy or financial education), and training on how to use a cell phone to get market information (e.g., prices)]. Given that both binary and ordinal variables need to be combined, polychoric PCA is used to calculate the index.

### Survey questions: hh206, hh207, hh1826, hh1828, hh1832, hh1836, hh1838.

3. **Diversity of livelihoods.** Calculated as the number of livelihood activities engaged in during the last year. The question asked to identify these livelihoods is, “What were the sources of your household’s food/income over the whole last 12 months?” The possible options are:
  - Farming/crop production and sales
  - Livestock production and sales
  - Wage labor (local)
  - Salaried work
  - Sale of wild/bush products (including charcoal)
  - Other self-employment/own business
  - Sale of other non-livestock assets/rental of land
  - Remittances
  - Gifts/inheritance
  - Other

### Survey question: hh1501.

4. **Exposure to information.** Number of topics (out of 13) about which respondent has received information in the last year.

### Survey question: hh1401.

5. **Asset ownership.** Asset ownership is measured based on three categories of assets: consumer durables, agricultural productive assets, and animals. Consumer durables ownership is measured as the number of consumption assets owned out of a total of 11. Ownership of agricultural productive assets is measured as the number of productive implements owned out of 22. Animal ownership is measured in Tropical Livestock Units (TLUs), as defined in Chapter 3. An overall asset index is constructed from the three measures using PCA.
6. **Aspirations and confidence to adapt.** Section 1.2.
7. **Bridging social capital.** See Section 1.3.
8. **Linking social capital.** See Section 1.3.

The overall index of adaptive capacity is calculated using polychoric factor analysis.

## AI.6 Index of Transformative Capacity

The index of transformative capacity is constructed from eight indicators:

1. **Formal safety nets.** The number of formal safety nets available in each household's community. The possible formal safety nets are:
  - Institution in community where people can receive food assistance
  - Institution in community where people can receive housing and other non-food items
  - Institution in community where people can receive assistance due to losses of livestock
  - Availability of a disaster response program from government or an NGO

**Survey questions: cm364, cm366, cm368, cm502\_6.**

2. **Access to markets.** The number of markets available within 20 km of the household's community. The possible markets are:
  - Livestock market
  - Market for selling agricultural products
  - Market for purchasing agricultural inputs

**Survey questions: cm347, cm351, cm354.**

3. **Access to infrastructure.** A score that adds 1 point for each of the following conditions:
  - At least half of the households in the household's community have access to piped water.
  - At least half of the households in the household's community have electricity.
  - The household's community either has cell phone service or a public telephone.
  - The community can be reached with a paved road.

**Survey questions: cm303, cm307, cm310, cm311, cm312, cm313\_1.**

4. **Access to basic services.** A score that adds 1 point for each of the following conditions:
  - Household's community has a primary school or within 5 km.
  - Household's community has a health center within 5 km.
  - Household's community has a facility for veterinary services within 5 km.
  - Household's community has agricultural extension services "offered in this area."
  - Household's community has institutions where people can borrow money.
  - Household's community has security services that can reach the community within 1 hour.

**Survey questions: cm320, cm321, cm330, cm331, cm335, cm336, cm343, cm360, cm359.**

5. **Access to livestock services.** The number of livestock services available “in your area” (asked of household survey respondents). The possible services are:
- Vaccination, dipping inoculation
  - Treatment for diseases
  - Animal de-worming
  - Breeding services
  - Commercial feed supply
  - Veterinary store with vaccines
  - Veterinary store with de-worming supplies
  - Veterinary store with antibiotics
  - Veterinary store with salt licks/mineral supplements
  - Other

**Survey question: hh1101.**

6. **Access to communal natural resources.** A score that adds 1 point for each of the following conditions:
- Household’s community has communal grazing land
  - Household’s community has a communal water source for livestock
  - People in household’s community get their firewood from communal land

**Survey questions: cm208, cm211, cm214.**

7. **Bridging social capital.** See Section 1.3.  
8. **Linking social capital.** See Section 1.3.

The index of transformative capacity is calculated using polychoric factor analysis.

## **AI.7 Index of Household Resilience Capacity**

The overall index of resilience capacity is calculated using PCA, with the indexes of absorptive capacity, adaptive capacity, and transformative capacity as inputs.

## **AI.8 Index of Community Resilience**

The index of community resilience is constructed from five indicators:

1. Number of NRM groups in the community, where the possible groups are communal grazing land management group, communal group deciding who can gather wood and how much from communal land, and communal water management group.

## Survey questions: cm209, cm215, cm217, cm401.

2. **Community disaster risk reduction index.** This index is constructed from four variables:
  - A binary variable indicating whether there is a disaster planning group in the community
  - The proportion of households in the community receiving information in the last year on long-term changes in weather patterns in the last year
  - ... on rainfall prospects/weather prospects for the coming season
  - ... on grazing conditions in nearby areas

The variables are combined into an index using polychoric factor analysis.

## Survey questions: cm401, hh1401.

3. **Social protection index.** This index is constructed from 13 variables:
  - A binary variable indicating whether there is a savings group in the community
  - A binary variable indicating whether there is a mutual help group (including burial societies) in the community
  - A binary variable indicating whether there is a women's group in the community
  - The proportion of households in the community that has received any assistance from relatives, neighbors, or friends in the last year
  - The proportion of households that have given any assistance to relatives, neighbors, or friends in the last year
  - The proportion of households that respond "yes" to the question, "If your household had a problem and needed money or food urgently, would you be able to get it from relatives living in this community?"
  - The proportion of households that respond "yes" to the question, "If your household had a problem and needed money or food urgently, would you be able to get it from people living in this community who are not your relatives?"
  - The proportion of households that respond "yes" to the question, "If a relative in this community had a problem and needed money or food urgently, would you be able to give money or food?"
  - The proportion of households that respond "yes" to the question, "If someone who is not your relative, but lives in this community had a problem and needed money or food urgently, would you be able to give money or food?"
  - The proportion of households that respond "yes" to the question, "If someone in your household fell ill or was injured, and you needed help with work, would you be able to get it from people in your community or from relatives?"

- The proportion of households that respond “yes” to the question, “If your household had a problem and needed help with work, would you be able to get it from people in your community who are not your relatives?”
- The proportion of households that respond “yes” to the question, “If a relative in this community had a problem and needed help with work, would you be able to give money or food?”
- The proportion of households that respond “yes” to the question, “If someone who is not your relative, but lives in this community had a problem and needed help with work, would you be able to give money or food?”

The variables are combined into an index using polychoric factor analysis.

**Survey questions: cm401, hh1804a, hh1815a, hh1805, hh1807, hh1810, hh1812, hh1816, hh1818, hh1821, hh1823.**

4. **Managing and maintaining public goods.** Binary variable indicating the presence of a civic (“improving community”) group in the community.

**Survey question: cm401.**

5. **Conflict mitigation.** The percentage of households in the community that received information on “conflict or other restrictions on access to grazing” in the last year.

**Survey question: hh1401.**

The overall index of community resilience was calculated using polychoric factor analysis.

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