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REPORT 4

# The Effects of Social Capital on Resilience Capacity: Evidence from Ethiopia, Kenya, Uganda, Niger and Burkina Faso

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| | |
|---|---|
| ATR | Ability-to-recover |
| BRACED | Building Resilience and Adaptation to Climate Extremes and Disasters |
| DFID | Department for International Development |
| HFIAS | Household Food Insecurity Access Scale |
| HH | Household |
| OLS | Ordinary Least Squares |
| PC | Pastoralist Clusters |
| PRIME | Pastoralist Areas Resilience Improvement and Market Expansion |
| (PRIME) IMS | (PRIME) Interim Monitoring Survey |
| RISE | Resilience in the Sahel-Enhanced |
| SAREL | Sahel Resilience Learning |
| TMG | The Mitchell Group |
| USAID | United States Agency for International Development |

# Introduction

1

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 (Frankenberger & Garrett 1998). While 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. 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 (Frankenberger et. al. 2013). Previous research demonstrates that the extent and application of social capital strongly influences resilience (Aldrich, 2012; Elliot et al., 2010; Magis, 2010; Wilson, 2012).

## Defining resilience

Resilience is defined in this paper as a capacity that ensures stressors and shocks do not have long-lasting adverse development consequences (Constas, Frankenberger & Hoddinott, 2014). Household resilience is the ability of a household to mitigate, adapt to, and recover from shocks and stresses. While resilience itself is an ability to manage or recover, resilience capacities are a set of conditions, attributes and skills that are thought to enable households to achieve resilience in the face of shocks. At the household level, these conditions can be classified into three categories:

- Absorptive capacity is the ability to minimize exposure to shocks and stresses (ex ante) where possible and to recover quickly when exposed (ex post).[1]
- Adaptive capacity involves making proactive and informed choices about alternative livelihood strategies based on changing conditions.
- Transformative capacity relates to governance mechanisms, policies/regulations, infrastructure, community networks, and formal safety nets that are part of the wider system in which households and communities are embedded. Transformative capacity refers to system-level changes that enable more lasting resilience.

Community resilience is defined as follows: "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." (Frankenberger, Mueller, Spangler & Alexander, 2013). 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] *Frankenberger, Langworthy, Spangler & Nelson, 2012.*

At the household level, social capital is viewed as one of key capacities that has a a direct bearing on resilience. However, amid the complex and dynamic interactions that take place within and between larger populations, social capital can also have a predominantly strong influence on the attainment of resilience at the community level (Aldrich, 2012; Cutter et al., 2008). For instance, disasters may sometimes enhance social capital because they activate or give rise to neighborhood associations and collective organizations that can be used to disseminate vital information, provide community members with a voice, and afford leverage to assist in taking control of rebuilding efforts (Aldrich, 2012).

Three types of social capital enhance resilience. **Bonding social capital** is seen in the bonds between community or group members. **Bridging social capital** connects members of one community or group to other communities/groups, and **linking social capital** is often conceived of as a vertical link between a network and some form of authority.

This paper will examine empirical evidence from several studies focused on measuring resilience including the Pastoralist Areas Resilience Improvement and Market Expansion (PRIME) program Impact Evaluation Baseline and the PRIME Interim Monitoring Survey (IMS) in Ethiopia, the Building Resilience and Adaptation to Climate Extremes and Disasters (BRACED) program Baseline in Kenya and Uganda, and the Resilience in the Sahel-Enhanced (RISE) initiative Impact Evaluation Baseline in Burkina Faso and Niger. The analysis will assess the extent to which the different types of social capital affect resilience. Specifically, this paper looks at the links between social capital and the following: household food security, households' ability to recover, shock impact and household asset wealth.

# Background

2

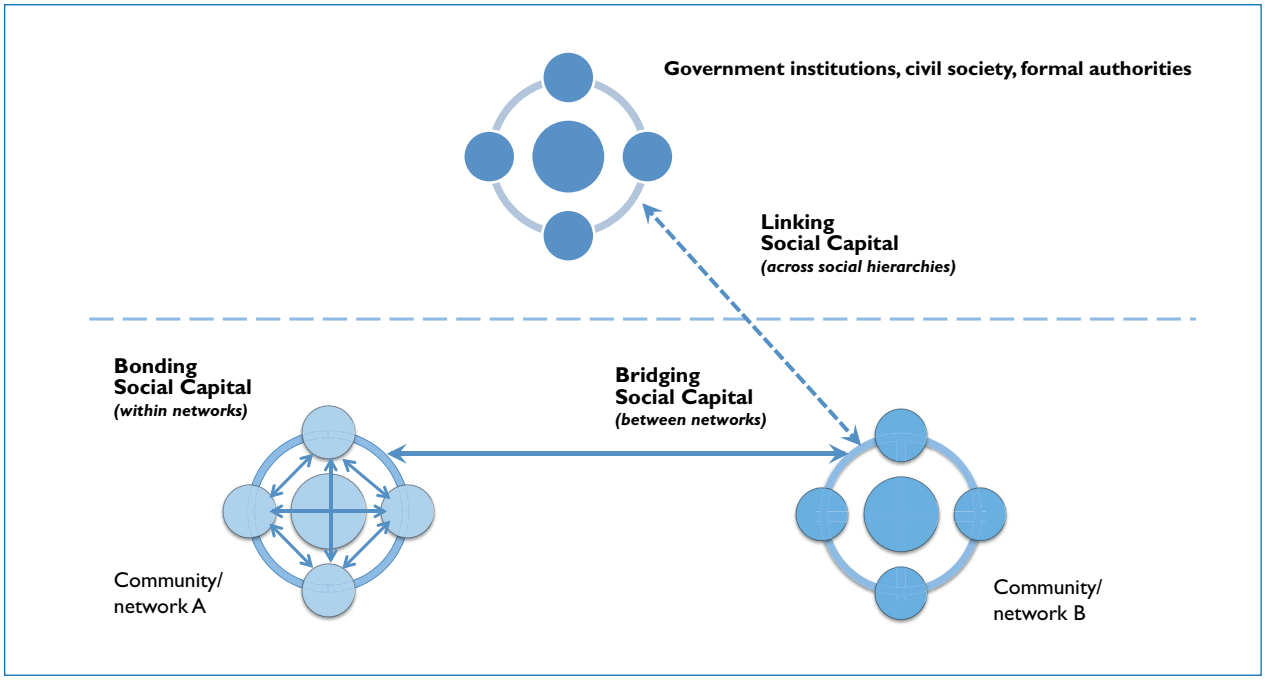
Social capital has been defined as the "collective value of all 'social networks' (who people know) and the inclinations that arise from these networks to do things for each other 'norms of reciprocity' (Putnam, 1993). This largely refers to civic engagement and political institutions; however, social capital is much broader because it also encompasses social processes at individual, household, and community levels. In terms of development, this definition is further expanded to describe the quantity and quality of social resources (e.g., networks, membership in groups, social relations, and access to wider institutions in society) on which people draw in pursuit of livelihoods (Frankenberger & Garrett, 1998; Putnam, 1993; Woolcock, 1998). Social capital binds together people in society and 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 (Chaskin, 2008).

Social capital influences community level resilience (Aldrich, 2012; Elliott et al., 2010; Magis, 2010; Wilson, 2012). Communities can increase their social capital if they work together, especially during stressed or crisis situations to share information or participate in rebuilding efforts or decision-making (Aldrich, 2012). Social capital can also have community-level benefits if people in shock-affected areas can call on connections outside the community in unaffected areas to request support (e.g. remittances, government support). In contrast, community resilience may decline with a lack of leadership, under-developed governance structures, or high levels of corruption (Smit & Wandel 2006).

Aldrich (2012) identifies three separate but interrelated forms of social capital - **bonding**, **bridging**, and **linking**, each of which are characterized by different types of formal and informal interactions with distinct but interrelated horizontal and vertical associations (see Figure 1). Horizontal links, often found in bonding and bridging social capital, are between people and groups of equal authority and status. Vertical links, found in linking social capital, are hierarchical linkages, often between a network and some form of authority.

Identifying the political economy factors at play in the context of the EDE and the ways in which these may impede or enable implementation. It is understood that barriers to decisions, institutional norms and capacities are some of the most important factors in whether an investment can stimulate actions that lead to sustainable development outcomes. The second step is even more complex. There is currently a recognised 'attribution gap' whereby it is not possible to quantify the impact of an action on resilience outcomes, less still to attribute impacts to an action.

Figure 1. Bonding, bridging, and linking social capital




Source: Reproduced with permission from Aldrich (2012, p. 34) in Frankenberger et al., (2013). Community Resilience: Conceptual Framework and Measurement Feed the Future Learning Agenda. Rockville, MD: Westat. Available at: https://agrilinks.org/sites/default/files/resource/files/FTF%20Learning_Agenda_Community_Resilience_Oct%202013.pdf

**Bonding social capital** refers to the horizontal links between family members, close friends, and neighbors (Aldrich, 2012), typically among a group of demographically, geographically, religiously, and/or ethnically similar people with shared norms and expectations (Putnam, 2000). Bonding social capital is built on trust, reciprocity, and cooperation and assumes a high level of familiarity, often at the cost of privacy. Bonding social capital can help households respond to idiosyncratic shocks (i.e. short-term, small-scale events with negative impacts) because they can request and receive help from unaffected households (Frankenberger et al., 2013). Following a more widespread shock such as a natural disaster, communities working together to help each other cope and recover may increase the extent and quality of their bonding social capital (Norris & Stevens, 2007; Solnit, 2009). Conversely, strong ties and emphasis on in-group identity may hinder interactions with individuals outside the network and possibly create indifference or distrust toward non-members (e.g., nationalism, patriotism, xenophobia) (Abrams et al., 2005; Coffé & Geys 2007).

**Bridging social capital**[2] connects members across communities or groups, often crossing ethnic/racial lines and geographic boundaries and can aid communities via access to resources, new perspectives, and assets, including remittances (Aldrich, 2012). Bridging social capital can lead to reduced conflict between groups as individuals learn about each other and common interests. It can also lead to exchanges of information and best practices, which may encourage people to adopt new practices (Frankenberger et al., 2013). When resources are lacking locally, people may use their bridging social capital and request support, resources, or information from people in other communities, which can be especially important to bolstering community resilience (Wetterberg, 2004). Bridging social capital is especially effective for addressing covariate shocks (i.e., large-scale events with negative impacts) because affected communities can request support from unaffected communities (Frankenberger et al., 2013).

*[2] In some pastoral groups, community can be more properly understood in terms of clan groups rather than geographical settlements. For this reason distinctions between bonding and bridging social capital may be more blurred. What is important is that in bridging social capital, assistance is provided by people that are horizontally linked but not experiencing the same covariate shock.*

**Linking social capital** connects social networks with some form of authority in the social sphere, often across institutionalized and formal societal boundaries. Such vertical links can provide otherwise unavailable resources and information, and are therefore important for economic development and resilience (Aldrich, 2012). Linking social capital can create feedback loops between otherwise independently operating entities (e.g., community members, grassroots organizations, scientists, government planners) working on thematically or geographically overlapping projects (Frankenberger et al., 2013).

Communities with higher levels of these three types of social capital are more resilient than those with only one or no social capital (Aldrich, 2012; Elliot et al. 2010; Woolcock & Narayan, 2000). While – or because – each type of capital is well-suited for responding to different types of shocks and building different types of relationships, no one type of capital is more important than the others; they must be developed and sustained together to ensure community resilience (Frankenberger et al., 2013).

This paper will examine the empirical evidence from four different studies focused on measuring resilience: PRIME, PRIME IMS, BRACED, and RISE. The analysis will focus primarily on the extent to which the different types of social capital affect resilience, as measured by household food security and ability to recover from shocks using multivariate regression models. Background on each of the studies will be provided in addition to a brief discussion of the indices constructed to measure the different types of social capital and dependent variables, including food security, recovery, and shock impact. Household wealth and social capital will also be examined for only the PRIME baseline and BRACED datasets.

*The resilience of a community is dependent on social bonds and collective action based on networks of relationships, reciprocity, trust and community norms. Social capital can contribute to community resilience by providing an informal buffer to those affected by disaster, overcoming challenges to adaptation through coordinated local processes, and enabling transformative change by strengthening the community's collective voice.*
*(Aldrich, 2012)*

## Hypotheses

- Households with greater levels of social capital (bonding, bridging, and linking) achieve greater levels of food security than those with less social capital, all else equal.
- Households with greater levels of social capital (bonding, bridging, and linking) are able to recover better than those with less social capital, all else equal.
- For a given level of exposure to shocks, households with more social capital report fewer negative impacts of shocks than households with less social capital, all else equal.
- Wealthier households have greater levels of social capital (bonding, bridging, and linking) and are better able to both receive and give assistance (in the form of money or food) than those of poorer households.

# 3 Datasets

## PRIME

PRIME is a USAID Ethiopia Feed the Future Project with three objectives: (1) increase household incomes, (2) enhance resilience, and (3) bolster adaptive capacity to climate change (Smith et al., 2015). The program targets pastoralists, non-pastoralists, and people transitioning between these two livelihoods in 23 woredas within three pastoralist clusters (PC): Southern PC (Borena, Guji, and Liban zones), Somali PC, and Afar PC. PRIME activities foster the competiveness of livestock value chains, addressing the needs of the very poor and chronically food insecure through value chain interventions, improving policy environment, improving delivery of health services, and behavior change.

### *Impact evaluation baseline dataset*

The PRIME impact evaluation (IE) baseline study collected quantitative and qualitative data, including detailed information about household resilience capacities (i.e., absorptive, adaptive, and transformative), exposure to shocks, and social capital. The baseline study collected quantitative data through a household and a community survey[3] and gathered qualitative data through focus group discussions and key informant interviews. Qualitative methods focused on capturing contextual information, including information about social capital such as individual and household engagement with formal and informal institutions and factors influencing community capacity for collective action (Smith et al., 2015). This paper presents the IE baseline data, collected from November 19 to December 24, 2013 in two of the three PRIME project sub-regions, Borena and Jijiga. A total of 3,142 households were sampled (1,744 from Borena and 1,398 from Jijiga) using the quantitative questionnaire.

*[3] Quantitative survey was developed by TANGO staff with input from Westat and USAID counterparts. Some questionnaire modules were 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 after Feed the Future/ Feedback population-based survey modules.*

### *Interim monitoring survey dataset*

The objective of the PRIME Interim Monitoring Survey (IMS) was to capture real-time household and community responses to shocks occurring during the implementation of the PRIME project. A major drought occurred in the PRIME IE area starting in March 2014, three months after the PRIME baseline survey was implemented. The interim monitoring survey data was collected between October 2014 and April 2015 from a selected panel of households from the baseline households over six rounds. A total of 414 households were included in the IMS sample (215 from Borena and 199 from Jijiga). Qualitative data, including focus group discussions and key informant interviews, were also collected.

## BRACED

Funded by the United Kingdom's Department for International Development (DFID), the Mercy Corps-led BRACED program enhances resilience to climate extremes in northern Kenya and Uganda through a community-led and systems-driven approach. The program focuses on vulnerable groups, particularly women and girls, and promotes improving public sector engagement and service delivery, broadening economic opportunity, and increasing community capacity to manage resources and prepare for disaster. Program beneficiaries include girls and boys between the ages of 12 and 19, and women and men aged 20 and over, with a priority on households living in poverty, female-headed households, families with chronically ill or disabled members, and households engaged in livelihood or market activities promoted through the project. The program operates throughout Wajir County and the urban center of Garissa on the Wajir/Garissa County border in Kenya, and throughout the Karamoja sub-region and its districts within Uganda. Both regions comprise arid/semi-arid landscapes that have traditionally been pastoral in Wajir and agro-pastoral in Karamoja.

The primary objective of the program is to increase the resilience capacities of men, women, girls and boys, to better absorb and adapt to shocks and stresses. This increased capacity will in turn contribute to improved household wellbeing. The theory of change that connects the outcome to outputs emphasizes meaningful and inclusive participation in four strategic areas: (1) good governance, (2) inclusive market systems, (3) natural and community resource management, and (4) empowerment of women and girls. These four outputs will build absorptive, adaptive, and transformative capacities that are essential to increased resilience to shocks and stressors. BRACED baseline data is currently limited to quantitative data. Qualitative data will be collected in the mid-term or during project implementation.

## RISE

The RISE initiative was funded by United States Agency for International Development (USAID). The Mitchell Group (TMG) oversees the Sahel Resilience Learning (SAREL) project team that carried out the baseline. The primary focus of RISE is to build resilience in the Sahel in the face of recurrent drought, covering three regions in Burkina Faso (Eastern, Northern Center, and Sahel) and three in Niger (Zinder, Maradi, and Tillabery). These regions are highly vulnerable to shocks due to the populations' marginal agricultural and agro-pastoral livelihoods. The objective of RISE is to achieve resilience by (1) increasing and sustaining economic welbeing by targeting poor households and marginalized women, (2) strengthening institutions and governance by targeting communities, and (3) improving health and nutrition by targeting children under 5 and women of reproductive age. Quantitative data was collected for the baseline evaluation in Niger and Burkina Faso from April 29 to May 30, 2015. A total of 2,492 households were surveyed from 100 villages. Qualitative data was also collected from focus group discussions and key informant interviews.

| | Project Area(s) | # of households | # of communities |
|---|---|---|---|
| **PRIME Baseline** | Jijiga | 1398 | 32 |
| | Borena | 1744 | 41 |
| **Prime IMS** | Jijiga | 199 | 9 |
| | Borena | 215 | 8 |
| **BRACED** | Karamoja | 553 | 24 |
| | Wajir | 563 | 10 |
| **RISE** | Burkina Faso | 1,449 | 58 |
| | Niger | 1,043 | 42 |

Table 1: Total number of households and communities in the project areas

# 4 Methodology

In order to measure the impact of social capital on resilience in the different project areas in this study, indices were created for bonding, bridging and linking social capital (See Annex 1). The bonding social capital index is based on eight yes/no questions about whether the household would be able to give or receive help from relatives or non-relatives in their community. The bridging social capital index is based on eight similar yes/no questions, but about giving and receiving help from relatives or non-relatives living outside their community. The linking social capital index measures, first, the amount of information received from government agents (i.e., rural development agents and government/political officials). Second, the index measures households' access to services generally provided by the government and the quality of those services including access routes (i.e., roads, trails), health services, facilities for veterinary services, and agricultural extension services.

## Food security

The measure for household food security (used in equation 1) is the inverse of an experiential indicator of food insecurity, the Household Food Insecurity Access Scale (HFIAS) (Coates, Swindale & Bilinsky, 2007). The HFIAS is an index constructed from the responses to nine questions regarding people's experiences of food insecurity in the previous four weeks. Responses range from worry about not having enough food to actual experiences of food deprivation associated with hunger, with the nine conditions related to food security. Survey respondents indicate whether or not they or another household member experienced the event or feeling in question and, if yes, how often in the last 30 days (rarely, sometimes or often). A score is then calculated based on these frequency responses. The inverse of the score is taken for the analysis of this study so that the measure increases with increasing household food security. Refer to Annex 2.1 for a more detailed description of how this scale is calculated.

$$HH\ food\ security = f\begin{pmatrix} \boldsymbol{Social\ capital\ (bonding, bridging, linking)}, \\ HH\ assets, \\ HH\ exposure\ to\ shocks, \\ HH\ human\ capital, \\ HH\ demographic\ characteristics * \end{pmatrix} \quad 1$$

*Age of household head, HH size/HH adult equivalent, and female only/female-headed household[4]

Equation 1 is a "community fixed effects" model, whereby community of residence is controlled for, thus controlling for those factors at the community level that influence the outcome.

[4] *The model for RISE varies slightly from the model above in that there are additional HH demographic characteristics included such as the household's maximum education level and pastoral status.*

**Note:** For the PRIME IMS data, a separate analysis is used in order to examine how the three types of resilience capacities (absorptive, adaptive and transformative) effect household food security. These capacities are indices that are comprised of several components, of which includes social capital. Refer to Annex 3. These components are run together in a multivariate regression analysis of which only social capital within these indices is reported in this paper. Other independent variables controlled in the analysis include: household demographic variables, education, pastoralist status (whether the households is a pastoral, agro-pastoral or non-pastoral household), the project area (Borena or Jijiga), and an asset index based on ownership of consumer durables, agricultural productive assets and livestock.

## Recovery

The dependent variable, recovery (equation 2), takes into account households' ability to recover from past climatic, conflict, and/or economic shocks. Because this variable is calculated differently across datasets, refer to Annex 2.2 for a more detailed description of the calculations used for PRIME, BRACED, and RISE.

$$HH\ recovery = f\begin{pmatrix} \boldsymbol{Social\ capital\ (bonding, bridging, linking)}, \\ HH\ assets, \\ HH\ exposure\ to\ shocks, \\ HH\ human\ capital, \\ HH\ demographic\ characteristics\ * \end{pmatrix} \quad 2$$

*Age of household head/percent of males and females by age category, HH size/HH adult equivalent/HH adult equivalent squared, and female only/female-headed household[5]

Overall, this model is a "community fixed effects" model, whereby community of residence is controlled for and thus controlling for those factors at the community level that influence the outcome.

*[5] The model for RISE varies slightly from the model above in that there are additional HH demographic characteristics included such as the household's maximum education level and pastoral status.*

## Shock impact

Equation 3 looks at the relationship between the three different types of social capital, household assets and household exposure to shocks in relationship to household shock impact. This model is only used for PRIME and BRACED. The dependent variable is an index which takes into account if a household experienced a shock within the last 12 months, how many times they experienced a shock within the last 12 months, and how severe the impact of the shock was on income and food consumption.

$$HH\ Shock\ Impact = f\begin{pmatrix} \boldsymbol{Social\ capital\ (bonding, bridging, linking)}, \\ HH\ assets, \quad HH\ exposure\ to\ shocks \end{pmatrix} \quad 3$$

[6] *Weighted mean for PRIME; unweighted mean for BRACED*

[7] *This main body of the paper only shows the results from the regression model that uses the three types of social capital. The annex tables shows the results for the models that use only bonding, bridging, and linking social capital for comparison purposes only.*

## Wealth analysis

For PRIME and BRACED only, respondents are labeled as "receivers" and/or "givers" of social capital using yes/no questions related to households' ability to "get" or to "give" money or food from others living inside and/or outside of their community. The mean for bonding, bridging, and linking social capital are calculated for receivers and givers[6] and then compared across three categories of wealth: poor, middle, and non-poor. Asset-based poverty is used in lieu of income-based poverty because it is better at capturing long-lasting, structural poverty. Asset-based poverty is also more appropriate in pastoralist and shock-prone settings where it is more consistent with traditional wealth rankings.

## Elasticity

Elasticity is computed in each table using coefficients from the analysis that uses all three types of social capital[7] and mean value of the indicator.

# Results

5

This section presents findings from multivariate regression analysis for the PRIME baseline, PRIME IMS, BRACED and RISE. The results explore the relationship between the three types of social capital and the dependent variables: household food security, households' ability to recover from shocks, and shock impact. The effects of wealth on social capital are also examined for only the PRIME baseline and BRACED data.

## PRIME baseline

Ethiopia has experienced rapid economic growth since 2004 but remains highly food insecure and is highly susceptible to shocks such as drought, flood, and food price spikes (Smith et al., 2015). Moreover, in the PRIME intervention area, pastoralists and agro-pastoralists comprise the majority of the population and are subject to challenging agro-climatic conditions including high mean temperatures, erratic and unpredictable rainfall, and patchy vegetation.

To deal with shocks, households employ a number of strategies, including relying on social networks and access to larger institutions in society both 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. Individuals receive informal support from relatives, neighbors or friends in the form of small loans, gifts or remittances far more often than they receive formal support such as food rations and food- or cash-for-work through government or NGO programs. Compared to Jijiga, more households in Borena reported having received social support of many kinds in the previous year.

From the baseline report, data on three types of social capital – bonding, bridging and linking social capital – were examined. All three types of social capital were much stronger in Borena than Jijiga.

### *Food security analysis*

Table 2 illustrates the relationship between social capital and household food security. In Jijiga, social capital is not significant; however the opposite is true in Borena where both bonding and bridging social capital are highly significant at the 0.01 level. For every 10% increase in bonding social capital, there is a 7.3% increase in food security in Borena. Likewise, there is a 4.0% increase in food security for every 10% increase in bridging social capital. Overall, bonding social capital has a greater effect on household food security than bridging social capital. Thus, in Borena, relationships at the household and community levels are more protective than those between communities. Linking social capital for both Borena and Jijiga is not significant.

Table 2. Relationship between social capital and household food security for PRIME baseline

| | Jijiga | | | | Borena | | | |
|---|---|---|---|---|---|---|---|---|
| Indicators | Coefficient | | Elasticity | *n* | Coefficient | | Elasticity | *n* |
| **Social capital** | | | | | | | | |
| Bonding social capital | 0.005 | | 0.030 | *1236* | 0.072 | *** | 0.732 | *1566* |
| Bridging social capital | 0.015 | | 0.057 | *1253* | 0.054 | *** | 0.402 | *1624* |
| Linking social capital | 0.025 | | 0.105 | *1253* | -0.005 | | -0.029 | *1624* |

NOTES: Stars represent statistical significance at the 0.01 (***), 0.05 (**) and 0.1 (*) levels.
Community (kebele) fixed-effects regression. t-statistics are robust to heteroskedasticity.

*[8] Linking social capital may be higher in Jijiga that Borena because of the presence of the Productive Safety Nets Programme in Jijiga. This formal safety net may be displacing the role of bonding and bridging social capital. .*

## *Recovery analysis*

This section explores the relationship between social capital and households' ability to recover for the PRIME baseline. As shown in Table 3, bonding, bridging and linking social capital are positively and significantly associated with recovery for Jijiga. With every 10% increase in bonding social capital, there is a 2.1% increase in recovery. Likewise for bridging social capital, every 10% increase results in an increase of 1.1%, and for linking social capital, a 10% increase leads to an increase in recovery by 7.6%. Linking social capital, overall, has the greatest impact on recovery in Jijiga; however, the same is not true for Borena. In Borena, linking social capital is not significant[8]. Although, in Borena, bonding and bridging social capital are significant, they affect recovery differently. Bonding social capital is positively related to recovery whereas bridging social capital has a negative impact. The magnitude in which bridging social capital affects recovery is minimal although significant. This finding could be explained by the fact that households that are sharing resources with other communities have fewer resources for themselves to use for recovery. This needs to be further investigated.

Table 3. Relationship between social capital and recovery for PRIME baseline

| | Jijiga | | | | Borena | | | |
|---|---|---|---|---|---|---|---|---|
| Indicators | Coefficient | | Elasticity | *n* | Coefficient | | Elasticity | *n* |
| **Social capital** | | | | | | | | |
| Bonding social capital | 0.009 | *** | 0.212 | *1127* | 0.005 | *** | 0.152 | *1430* |
| Bridging social capital | 0.007 | *** | 0.110 | *1146* | -0.002 | * | -0.041 | *1476* |
| Linking social capital | 0.043 | *** | 0.757 | *1146* | 0.004 | | 0.073 | *1476* |

NOTES: Stars represent statistical significance at the 0.01 (***), 0.05 (**) and 0.1 (*) levels.
Community (kebele) fixed-effects regression. t-statistics are robust to heteroskedasticity.

## *Shock impact*

Table 4 shows that bonding social capital for both Jijiga and Borena has a negative relationship with shock exposure. Thus, it can be said that bonding social capital negates the effects of shocks. Bridging social capital, on the other hand, is positively associated in Borena but negatively associated in Jijiga. Linking social capital is not significant in either project area. It is also interesting to note that in Borena having more assets (or asset wealth) protects households against shock exposure, the same is not true in Jijiga where asset wealth is not significant.

Table 4. Relationship between social capital, asset index, and number of shocks on shock exposure for PRIME baseline

| Indicators | Jijiga | | | Borena | | |
|---|---|---|---|---|---|---|
| | Only bonding social capital (A) | Only bridging social capital (B) | Only linking social capital (C) | Only bonding social capital (A) | Only bridgin g social capital (B) | Only linking social capital (C) |
| **Social capital** | | | | | | |
| Bonding social capital | -0.011 *** | | | -0.008 *** | | |
| Bridging social capital | | -0.011 *** | | | 0.012 *** | |
| Linking social capital | | | 0.000 | | | 0.004 |
| Asset index | 0.002 | -0.002 | -0.006 | -0.015 * | -0.032 *** | -0.020 *** |
| No. of shocks | 3.564 *** | 3.558 *** | 3.563 *** | 3.611 *** | 3.599 *** | 3.592 *** |
| No. of observations | 1324 | 1351 | 1352 | 1618 | 1618 | 1618 |

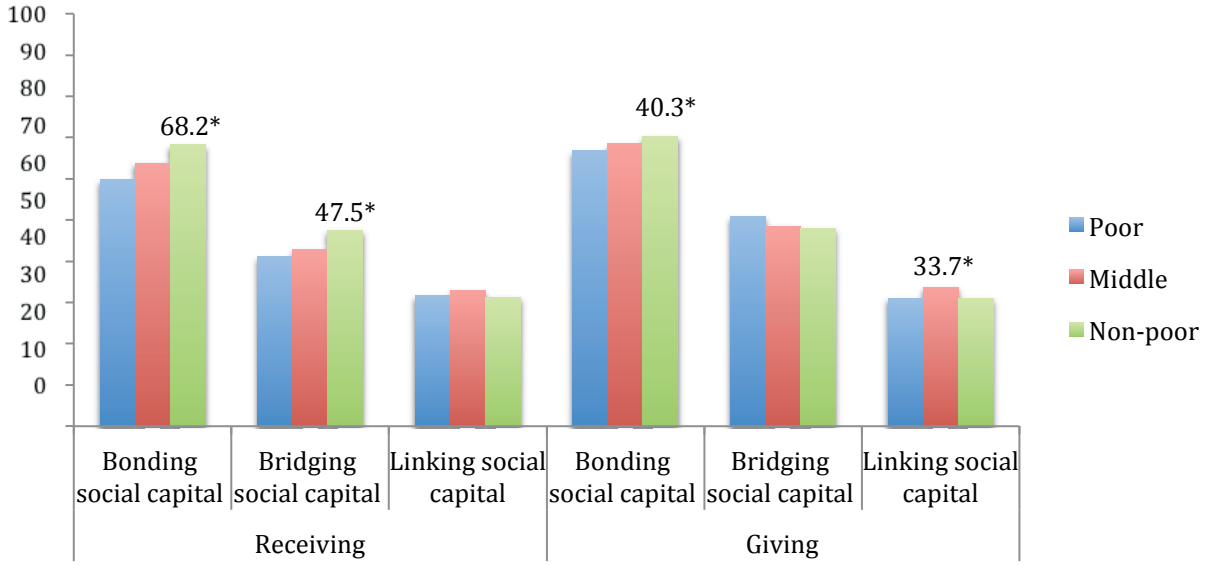
NOTES: Stars represent statistical significance at the 0.01 (***), 0.05 (**) and 0.1 (*) levels.

## *Wealth analysis*

This section compares the three types of social capital across those households that give assistance and those households that receive assistance, using asset ownership as a measure of poverty. As expected those in the highest wealth tercile in both project areas have greater bonding, bridging, and linking social capital when receiving assistance. As for giving assistance, wealthier households in Borena give more than those in Jijiga.

As shown in Figure 2, households in Jijiga who are in the highest wealth tercile have greater access to assistance in the form of food or money within and across communities than poorer households. The mean bonding social capital is 68.2 for non-poor households where it is only 59.7 for poor and 63.8 for middle wealth households. The mean bridging social capital is 47.5, 42.8, and 41.1 for non-poor, middle and poor households, respectively. When comparing those who give assistance, only those in the middle wealth tercile have a significantly higher mean linking social capital (33.7) in comparison to those who are poor (31.0) and non-poor (31.0).

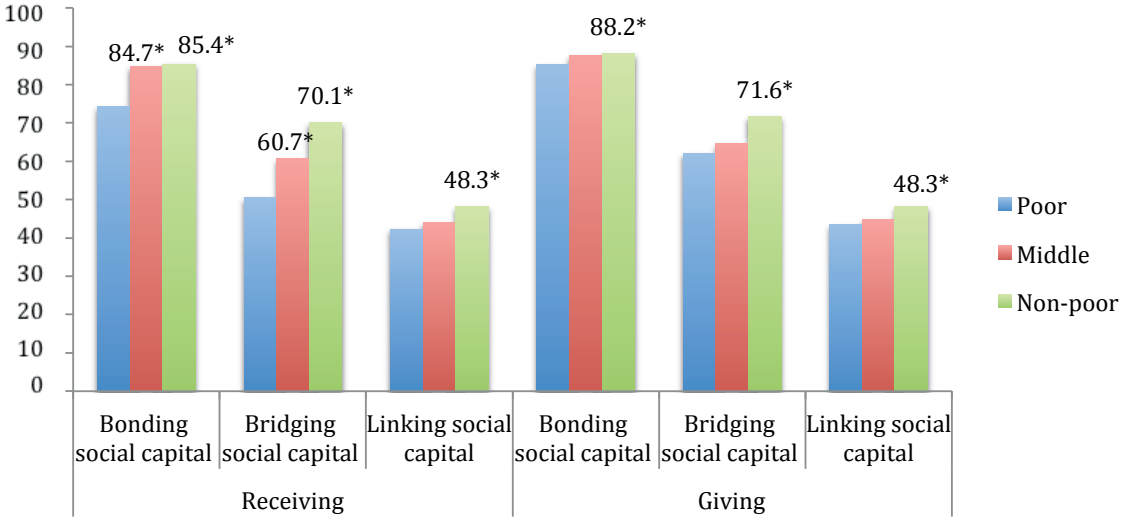
Figure 2. Social capital indices (mean values) for households receiving/giving assistance by wealth tercile, Jijiga




NOTES: Stars represent statistical significance at the 0.1 (*) level.
Poor in the wealth tercile is the dummy variable.

When comparing the two project areas, Borena has greater social capital than Jijiga for both receiving and giving assistance. Social capital in Borena, (Figure 3) is highest and significantly different from poor households (dummy variable) for bonding, bridging, and linking across both givers and receivers. Among receivers, the mean bonding social capital for non-poor is 85.4 compared to poor at 44.3 and 84.7 for middle income households. The gap between poor and non-poor households is greatest among those receiving and giving food or money outside their community or bridging social capital. Those who are poor and received assistance have a mean bridging social capital of 50.5 where those who are non-poor have a mean of 70.1. Likewise, poor who provide assistance have a mean bridging social capital of 62.0 and non-poor have a mean of 71.6.

Figure 3. Social capital indices (mean values) for households receiving/giving assistance by wealth tercile, Borena




NOTES: Stars represent statistical significance at the 0.1 (*) level.
Poor in the wealth tercile is the dummy variable.

## *Summary*

- Bonding and bridging social capital are significantly associated with increased food security in Borena and but not in Jijiga.
- In both Jijiga and Borena, bonding and bridging social capital enabled households to recover.
- Linking social capital is important for recovery in Jijiga but not Borena.
- Bonding social capital helps mitigate the effect of shocks in Jijiga and Borena.
- Bridging social capital helps mitigate the effects of shocks in Jijiga but not Borena; rather, bridging social capital has the opposite effect. One explanation for this is that when households share resources with other communities, there are fewer resources available for their own recovery.
- Linking social capital does not have an effect in either Jijiga or Borena for shock mitigation.
- The highest wealth tercile in both Jijiga and Borena areas has greater bonding and bridging social capital when receiving assistance.
- In terms of giving assistance, the wealthier give more in Borena than in Jijiga.

# PRIME IMS

Quantitative and qualitative data were collected after the 2014 drought in PRIME project areas, an event which led to major pasture and water shortages and livestock and crop diseases. This resulted in the deterioration of livestock health, livestock deaths, and crop failures. Soaring cereal prices and plummeting livestock prices led to the decline of the livestock-to-cereal terms of trade. Farmers struggled to obtain food through market channels rather than relying on their own crop production. Further, there were extensive abnormal migration patterns as pastoralists and agro-pastoralists searched for water and pasture for their animals. The focus group discussions and the key informant interviews revealed a situation in which strong forms of mutual support were crucial to the survival of many community members during the drought, but these forms of mutual support were being overstretched to the breaking point by the recurrent drought and multiple shocks. One of the most important coping strategies to deal with the drought used in both Jijiga and Borena is reliance on social capital.

In Borena, the initial round of IMS data shows that households' absorptive capacity had a positive impact on their ability to recover from the drought, despite having a higher shock exposure than Jijiga. Bonding social capital is thought to contribute to these households' absorptive capacity. However, over the six rounds of the IMS data collection this social capital started to erode. In the face of such a large covariate shock, better-off households were not able to support the poorer households with redistribution of food and animals as they do in normal times. As noted above, community leaders, particularly clan leaders, were also forced to migrate with their animals in search of water and fodder, making it more difficult for governance structures to function to enable the redistribution of food and resources. This migration also led to a breakdown of social relationships both internal to households and within the community. And at times the stress of drought conditions led to increased inter-ethnic conflict due to competition over pasture and water.

### *Resilience capacity analysis*

Table 5 contains results of a regression analysis looking at which specific contributors to the three dimensions of resilience capacity may have played a role in the two areas of PRIME data collection, Borena and Jijiga. The dependent variable of the regression is the change in food security over the drought period. Drought exposure is controlled for using six alternative measures (listed in the top row of the table). Most of these are calculated from satellite remote sensing data retrieved from the African Flood and Drought Monitor[9] specifically for the villages (kebeles) for which data were collected. The last one is a perceptions-based measure calculated using data on the number of downstream drought-related shocks households experienced in addition to the perceived severity of the shocks as measured on a five-point scale.

The first column of Table 5 only lists the social capital indices under each resilience capacity.[10] The red-colored boxes signify that, for a particular shock exposure measure, the regression coefficient is positive and statistically significant at least at the 0.1 level. Results show that bonding social capital contributes to households' absorptive and adaptive capacities for only Borena. However, bridging social capital is positive and statistically significant under adaptive capacity for both Borena and Jijiga over the drought period. Linking social capital had no effect on the resilience capacities across both project areas.

*[9] African Flood and Drought Monitor, Princeton University. http://stream.princeton.edu/AWCM/WEBPAGE/index.php*

*[10] The full regression model looks at all contributing factors that make up each resilience capacity.*

Table 5. Effect of resilience capacity and index sub-components on changes in food security over the drought period for PRIME IMS

| Shock measure: | Change in rainfall deficit from baseline to R1 | | | 12-month rainfall deviation from norm at R1 | | | Cumulative (net) rainfall deficit from baseline to R1 | | | Change in soil moisture deficit from baseline to R1 | | | Cumulative soil moisture deficit from baseline to R1 | | | Perceptions-based drought exposure index (Kebele fixed-effects), R1 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | J | A | B | J | A | B | J | A | B | J | A | B | J | A | B | J |
| **Absorptive capacity** | | 0.05 | | | 0.01 | | | 0.01 | | | 0.05 | | | 0.01 | | | 0.1 | |
| Bonding social capital | | 0.1 | | | 0.05 | | | 0.05 | | | 0.05 | | | 0.05 | | | 0.1 | |
| **Adaptive capacity** | | | | | | | | | | | | | | | | | 0.1 | |
| Bonding social capital | | 0.1 | | | 0.05 | | | 0.05 | | | 0.05 | | | 0.05 | | | 0.1 | |
| Linking social capital | | | | | | | | | | | | | | | | | | |
| **Transformative capacity** | | | | | | | | | | | | | | | | | | |
| Bridging social capital | | 0.1 | | | 0.1 | | | 0.1 | | 0.1 | | | 0.1 | | | 0.1 | | |
| Linking social capital | | | | | | | | | | | | | | | | | | |

A=all; B=Borena; J=Jijiga

Note: Numbers reported in boxes are significance levels associated with each measure in the first column. Red-shaded cells indicate a positive, statistically significant coefficient at least at the 0.1 level

### *Summary*

- Absorptive capacity had a positive impact on the ability to recover from the drought in Borena, despite having a higher shock exposure than Jijiga in the first round of IMS data collection.
- Bonding social capital is thought to contribute to these households' absorptive capacity.
- However, over the six rounds of the IMS data collection this social capital started to erode.

## BRACED

Despite 50 years of aid, inhabitants of northern Kenya and Uganda struggle to survive in the face of poverty and catastrophe. Climate change is exacerbating vulnerability for these populations through recurrent, intensified drought and uncertain weather patterns. The BRACED baseline survey aims to provide more detailed information about household resilience capacities and food security outcomes for the two project implementation areas, Karamoja in Uganda and Wajir in Kenya. These regions are historically marginalized with a dearth of natural resources, investment and social capital. Both are traditionally pastoralist or agro-pastoralist; however, data from the baseline analysis suggest that despite having similar household and community characteristics, the effects of social capital on food security, recovery and shock impact vary greatly between Karamoja and Wajir.

### *Food security analysis*

Results from Table 6 highlight the effect social capital has on household food security for the BRACED project areas, Karamoja and Wajir. Similar to the results for Borena in PRIME, Karamoja's bonding and bridging social capital is significant at the 0.01 level. It shows that for every 10% increase in bonding and bridging social capital, there is a 5.2% and 5.1% increase in food security, respectively. In Wajir, bonding and bridging social capital are not significant; however, linking social capital is significant but negatively associated with food security. This finding might be explained by the fact that the most vulnerable food insecure households in Wajir are living near places where food distributions take place, and these areas often have good access to basic services which is one measure used for linking social capital. Linking social capital in Karamoja is not significant.

Table 6. Relationship between social capital and household food security for BRACED

| | Karamoja | | | | Wajir | | | |
|---|---|---|---|---|---|---|---|---|
| **Indicators** | **Coefficient** | | **Elasticity** | ***n*** | **Coefficient** | | **Elasticity** | ***n*** |
| **Social capital** | | | | | | | | |
| Bonding social capital | 0.378 | *** | 0.518 | *531* | -0.046 | | -0.017 | *545* |
| Bridging social capital | 0.387 | *** | 0.513 | *531* | -0.033 | | -0.010 | *545* |
| Linking social capital | 0.446 | | 0.573 | *531* | -1.674 | *** | -0.807 | *544* |

NOTES: Stars represent statistical significance at the 0.01 (***), 0.05 (**) and 0.1 (*) levels. Community (kebele) fixed-effects regression. t-statistics are robust to heteroskedasticity.

### *Recovery analysis*

Table 7 shows the results across the three types of social capital and a households' ability to recover. In Karamoja, bonding and bridging social capital is positively associated with recovery at the 0.01 level. The impact of bonding and bridging social capital is minimal with an elasticity of 0.11 and 0.12, respectively. That is to say an increase of 10% in bonding social capital results in only a 1.1% increase in a households' ability to recover. Likewise, for bridging social capital, a 10% increase results in only a 1.2% increase in recovery. Linking social capital is not significant in Karamoja whereas in Wajir, linking social capital is significant but is negatively associated with recovery. Again those vulnerable households that are least able to recover are located near food distribution sites that have good access to basic services, a measure used for linking social capital.

Table 7. Relationship between social capital and recovery for BRACED

| | Karamoja | | | | Wajir | | | |
|---|---|---|---|---|---|---|---|---|
| **Indicators** | **Coefficient** | | **Elasticity** | ***n*** | **Coefficient** | | **Elasticity** | ***n*** |
| **Social capital** | | | | | | | | |
| Bonding social capital | 0.003 | *** | 0.112 | *549* | 0.009 | | 0.103 | *547* |
| Bridging social capital | 0.003 | *** | 0.122 | *549* | 0.003 | | 0.026 | *547* |
| Linking social capital | 0.038 | | 1.325 | *549* | -0.045 | *** | -0.664 | *546* |

NOTES: Stars represent statistical significance at the 0.01 (***), 0.05 (**) and 0.1 (*) levels. Community (kebele) fixed-effects regression. t-statistics are robust to heteroskedasticity.

### *Shock impact*

As shown in Table 8, all three types of social capital, asset index, and number of shocks on shock exposure for BRACED, all three types of social capital help negate the effects of shocks in Karamoja whereas In Wajir, this is only true for linking social capital. Across both project areas, asset wealth is protective against shocks and highly significant at the 0.01 level.

Table 8. Relationship between social capital, asset index, and number of shocks on shock exposure for BRACED

| | Karamoja | | | Wajir | | |
|---|---|---|---|---|---|---|
| Indicators | Only bonding social capital (A) | Only bridging social capital (B) | Only linking social capital (C) | Only bonding social capital (A) | Only bridging social capital (B) | Only linking social capital (C) |
| **Social capital** | | | | | | |
| Bonding social capital | -0.033 *** | | | 0.000 | | |
| Bridging social capital | | -0.031 *** | | | 0.003 | |
| Linking social capital | | | -0.021 * | | | -0.008 *** |
| Asset index | -0.062 *** | -0.063 *** | -0.064 *** | -0.036 *** | -0.036 *** | -0.033 *** |
| No. of shocks | 0.621 *** | 0.622 *** | 0.621 *** | 0.278 *** | 0.277 *** | 0.275 *** |
| No. of observations | 545 | 545 | 546 | 547 | 547 | 546 |

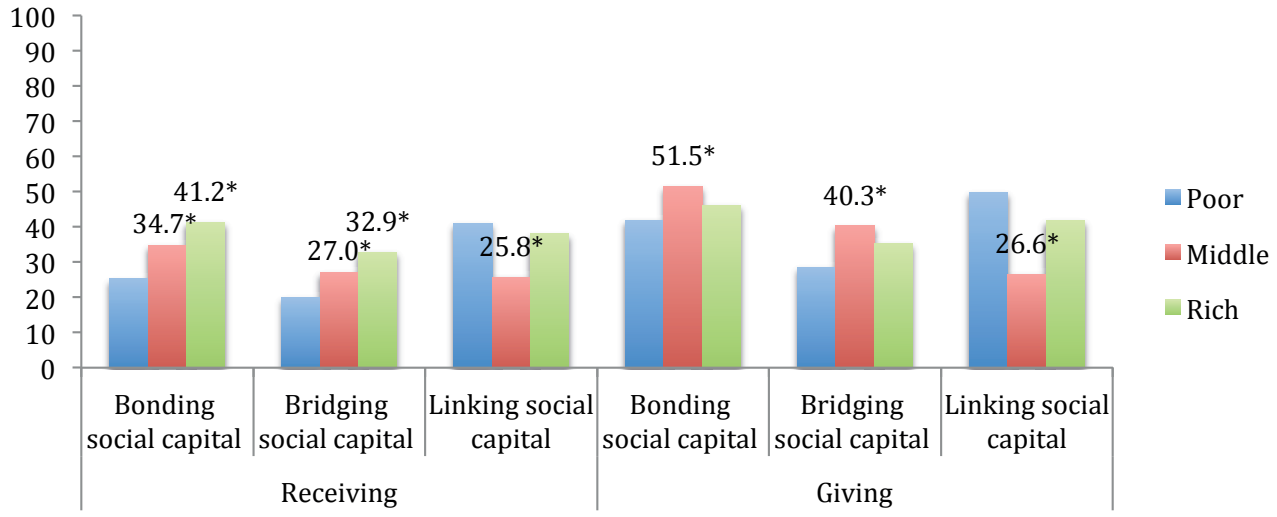
NOTES: Stars represent statistical significance at the 0.01 (***), 0.05 (**) and 0.1 (*) levels.

### *Wealth analysis*

The three types of social capital are compared across households that give assistance and households that receive assistance, using asset ownership as a measure of poverty. The mean social capital of middle households and the mean social capital of non-poor households was compared to that of poor households (dummy variable). As Figure 4 and Figure 5 indicate, those households in Karamoja have a greater mean social capital of middle and the mean social capital of non-poor households in Wajir is statistically different from the poor. This is not the case in Karamoja.

As shown in Figure 4, households in Wajir who are in the highest wealth tercile have better access to help in the form of food or money within and across communities than poor households. When receiving assistance, however, poor households have greater linking social capital than middle and non-poor. This could be due to the targeting of formal safety nets in Wajir to the poor. Households within the middle wealth tercile who give assistance have greater bonding and bridging social capital but not linking social capital.

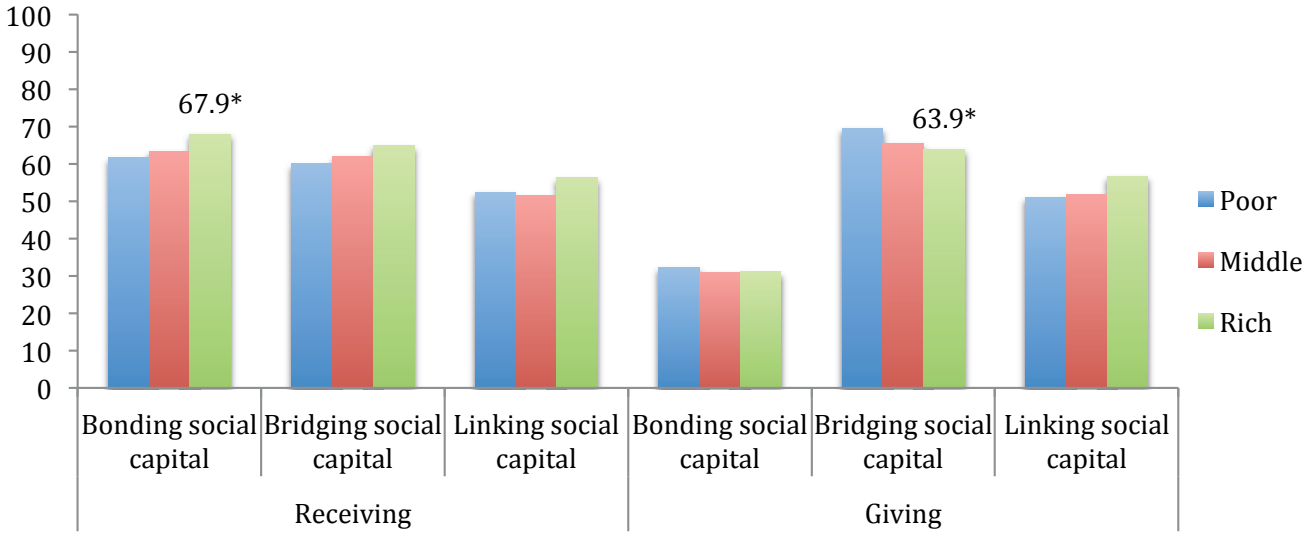
Figure 4. Social capital indices (mean values) for HHs receiving/giving assistance in food, money or employment assistance across wealth terciles (assets), Wajir




NOTES: Stars represent statistical significance at the 0.1 level
Poor category is the dummy variable

In Karamoja (Figure 5), mean bonding social capital among non-poor households is significantly different from poor households for those who receive assistance. That is to say households who have more asset wealth are better able to get help in the form of food and money in times of shocks from within their community than those who are poorer. When comparing those households that give, bridging social capital among non-poor is significantly different from poor households. Thus, non-poor households are more capable to provide assistance to others outside their community than those of poorer households.

Figure 5. Social capital indices (mean values) for HHs receiving/giving assistance in food, money or employment assistance across wealth terciles (assets), Karamoja




NOTES: Stars represent statistical significance at the 0.1 level
Poor category is the dummy variable

### *Summary*

- Bonding and bridging social capital are significantly associated with increased food security in Karamoja but not in Wajir.
- Linking social capital has a negative relationship to food security and recovery in Wajir. This appears to be explained by the fact that the most vulnerable food insecure households that have difficulties to recover in Wajir are living near places where food distributions take place, and these areas often have good access to basic services which is one measure used for linking social capital.
- Bonding and bridging social capital were important for recovery in Karamoja but not Wajir.
- All three types of social capital have a mitigating effect on shocks in Karamoja but only linking social capital in Wajir.
- The highest wealth tercile in Karamoja and Wajir have greater bonding social capital when receiving assistance. In Wajir, these same households also have greater bridging social capital.
- In terms of giving assistance, those households within the middle wealth tercile that give assistance have greater bonding and linking social capital but not linking in Wajir.

## RISE

The findings from the RISE baseline study reveal the striking deficit in resilience-related behaviors and recovery at the local level. When surveyed about their level of recovery from shocks sustained over 12 months, over three-quarter of households surveyed either did not recover or recovered to some degree but have been worse off as a result of the shock. A majority of households borrowed money or food from friends as their main source of coping with these shocks, relying heavily on their social capital. Other coping strategies utilized include altering their cattle and landholdings, migration, and reducing current expenditures. The analysis presented in this paper looks at social capital in relation to household food security and a household's ability to recover from past shocks.

### *Food security and recovery analysis*

The results from Table 9 provide evidence of the link between social capital, food security, and recovery. The three types of social capital are strongly associated with household food security. For every 10% increase in bonding, bridging and linking social capital, there is a 0.4, 0.3 and 1.4% increase in food security, respectively. For the 'ability to recover' dependent variable, only bonding and bridging social capital are significant. Linking social capital is not a significant predictor of recovery.

Table 9. Relationship between social capital, ability to recover and food security for RISE baseline

| | Household food security | | Elasticity | Ability to recover | | Elasticity |
|---|---|---|---|---|---|---|
| **Social capital** | | | | | | |
| Bonding social capital | 0.039 | *** | 0.128 | 0.003 | ** | 0.085 |
| Bridging social capital | 0.032 | *** | 0.081 | 0.002 | ** | 0.053 |
| Linking social capital | 0.145 | ** | 0.260 | 0.013 | | 0.243 |

NOTES: Stars represent statistical significance at the 0.01 (***), 0.05 (**) and 0.1 (*) levels.
Community (village) fixed-effects regression. t-statistics are robust to heteroskedasticity.

## *Summary*

- Bonding and bridging social capital are critical to recovery.
- All three types of social capital have a positive impact on food security.

# 6 Conclusion

Based on this meta-analysis across these three projects, social capital appears to have a positive effect on food security, helps households recover from shocks, and mitigates the effect of shocks across the different data sets. Thus it can be said that social capital appears to be critical to resilience. All four of our hypotheses appear to be true. Wealthier households appear to receive the benefits of social capital more than poorer households. This can be explained by the fact that households that have more assets are more likely to engage in reciprocal exchanges whereas the poorer households have less to exchange.

Projects that create community groups to carry out a specific function (i.e. savings groups, marketing groups, natural resource management groups) rarely track the other collective action functions that such groups might take on. Thus we do not always track the increases in social capital or understand what activities lead to greater social capital. Understanding these additional functions and monitoring them could be a key aspect of resilience measurement that enables programmers to strengthen social capital in the future.

Although social capital appears essential to a households' ability to cope with shocks, it is not an infinite resource. As seen in the PRIME IMS data, social capital can be used up in the early phases of a prolonged covariate shock and its downstream effects. Thus only strengthening social capital is not enough to build resilience. We still need to strengthen other capacities that enable households and communities to manage shocks and stresses.

## Recommendations for further research

The findings of this meta-analysis point to several issues that need to be further investigated. First, a better set of indicators needs to be developed for capturing linking social capital. The indicators used in this study led to confounding results and could be improved to capture how linking social capital can be used by households and communities to recovery from shocks. Second, further research is needed to determine how households use social capital over time. Based on the interim monitoring data from PRIME, It appears that bonding social capital is used first, then bridging and finally linking social capital. This needs to be tested empirically. Finally, it is important to determine if linking social capital is beginning to replace bonding and bridging social capital where food and cash transfers have been carried out over a number of years. Findings from Jijiga and Wajir give some indication that this could be taking place. More research is needed on this.

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# Annex 1
## Indices for 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; and
- Two asking whether the household would be able to give help to non-relatives within the community.

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.

The **linking social capital** index measures (1) the amount of information received from two types of government agents, rural development agents and government (political) officials; and (2) the 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.[11]

*[11] The availability and quality of schools was also assessed, but did not correlate positively with the other measured aspects of linking social capital and so was not included in the index*

Principal Component Analysis (PCA) is used for calculating the bonding and bridging social capital indices (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 since some variables are ordinal. All indices are placed on a 0-100 scale in order to enable cross-index comparisons. Because the social capital indices are used further in calculating the resilience capacity indices, missing values were predicted using Ordinary Least Squares (OLS) 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 indices are predicted is: 218 for bonding social capital, 221 for bridging social capital, and 47 for linking social capital.

# Annex 2
## Calculation of dependent variables

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### 2.1 Household food security index

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

1 Worry that the household would not have enough food

2 Any household member was not able to eat the kinds of foods preferred because of a lack of resources

3 Any household member had to eat a limited variety of foods due to a lack of resources.

4 Any household member had to eat some foods that they really did not want to eat because of a lack of resources to obtain other types of food

5 Any household member had to eat a smaller meal than he/she felt they needed because there was not enough food

6 Any household member had to eat fewer meals in a day because there was not enough food

7 There was ever no food to eat of any kind in the household because of lack of resources to get food

8 Any household member went to sleep at night hungry because there was not enough food

9 Any household member went a whole day and night without eating anything because there was not enough food.

Survey respondents indicate whether or not they or another household member experienced the event or feeling in question and, if yes, how often in the last 30 days (rarely, sometimes or often). A score is then calculated based on these frequency responses. The inverse of the score is taken for the analysis of this report so that the measure increases with increasing household food security.

## 2.2 Recovery

### *2.2.1 PRIME*

The recovery variable used for the two project areas from PRIME, Jijiga and Borena, is sourced from a question (q306) in the PRIME baseline survey asking households: "To what extent were you and your household able to recover from [a specific shock]?". The responses are coded with values ranging from 1 to 5, with 1 indicating that a household did not recover from the shock and 5 representing the highest level of recovery in which a household was not affected by (presumably immune in some form to) the shock. The dependent variable (mean306) is the average value reported by a household respondent for all shocks (of 18 possible) experienced by the household in the past year.

### *2.2.2 BRACED*

The question (q307) sourced from the BRACED baseline household survey for the recovery variable asks "How is the quality of life for you and your household now, after having been exposed to the shocks you have mentioned?". Responses were reverse-coded and thus increase with respect to household's perceived ability to recover to some combination of shocks experienced in the previous 12 months. The dependent variable takes the following values: 1=have not recovered at all; 2=partially recovered; 3=fully recovered same as before the shock; and 4=fully recovered and better before the shocks.

In the case of Karamoja, a Heckman two-step correction estimator (Heckman 1976) is used to provide consistent estimates of the relationship between social capital and recovery as part of the multivariate analysis. Due to a technical issue, 138 out of 553 households were missing data for self-reported recovery. Households reporting 'don't know' or 'refuse' to the series of questions about shock did not respond to question 307. Analysis showed statistically significant differences between households with data on question 307 and those without. Using only data for households with responses in a regression equation would lead to biased estimates.

### *2.2.3 RISE*

The 'ability to recover' variable used for RISE is an index from two summary measures of households' ability to recover from shocks that can be used for comparison across population groups. The index takes into account that households do not experience the same types of shocks of the same severity and thus it was necessary to create a "shock exposure corrected" index to measure ability to recover. The first summary measure looks at the% of households recovering from all of the shocks they experienced (q305). Question 305 asks to what extent households were able to recover from shocks experienced in the previous year. For all shocks a household reported experienced in the previous year, they were asked this question. The possible responses include: 1=did not recover; 2=recovery partially, but worse than before the shock; 3=recovered to the same level as before the shock; 4=recovered and better than before the shock; and 5=not affected by the event. The index is the mean value of respondents' responses to the question across all of the shocks experienced.

The second summary measure takes into account the fact that different population groups have different shock exposure, in effect equalizing their shock exposure in order to single out differences in their ability to recover (q304). Question 304 asks, "How severe was the impact on your income and food consumption?". The possible responses are: 1=none; 2=slight impact; 3=moderate impact; 4=strong impact; and 5=worst ever happened. The shock exposure measure is then a weighted average of the incidence of experience of each shock (a variable equal to one if it was experienced and zero otherwise), multiplied by the perceived severity of the shock. The shock exposure index ranges from 1 to 57.

Finally, a shock-exposure-corrected index was calculated to create a measure of ability to recover that assumes households experienced the same shock exposure and thus is 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 one in the shock exposure index can be expected to change the ability to recover index. 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 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.

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# Annex 3
## Indices for resilience capacity (used in PRIME IMS analysis)

Indices were created for absorptive, adaptive and transformative capacities used in the multivariate regression analysis. They are composite measures based on multiple indicators described in more detail below. Polychoric factor analysis is used to construct these indices.

### 3.1 Index of absorptive capacity

The index of absorptive capacity is constructed from seven indicators, some of which are themselves indices based on primary data collected in the household or community survey. The indicators are listed below.[12]

1. Informal Safety Nets
2. Shock Preparedness and Mitigation
3. Hazard Insurance
4. Household Perceived Ability to Recover
5. Bonding Social Capital
6. Whether a hold currently holds savings
7. Asset Ownership

*[12] Refer to the PRIME baseline report (Smith et al. 2015) for a full explanation of the calculations used for each component that comprise the three types of resilience capacities.*

### 3.2 Index of adaptive capacity

The index of adaptive capacity is constructed from eight indicators. Again, some of these are themselves indices based on primary data collected in the household or community survey. The indicators are as follows:

1. Access to Financial Resources
2. Human Capital
3. Diversity of Livelihoods
4. Exposure to Information
5. Asset Ownership
6. Aspirations and Confidence to Adapt
7. Bridging Social Capital
8. Linking Social Capital

### 3.3 Index of transformative capacity

The index of transformative capacity is constructed from eight indicators, including:

1. Formal Safety Nets
2. Access to Markets
3. Access to Infrastructure
4. Access to Basic Services
5. Access to Livestock Services
6. Access to Communal Natural Resources
7. Bridging Social Capital
8. Linking Social Capital

# Annex 4
## Additional methodology for PRIME and BRACED

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## 4.1 Regression analysis controlling for aspects of resilience capacity

A second regression analysis was performed to compare food security and recovery to social capital, other aspects of the resilience capacity, and household characteristics. These results are not presented in the report but the methodology is provided here to give insight into how this regression model was developed. The results from this analysis can be found in the Annex for both PRIME and BRACED. It should be noted that the results from this model and the one in the report are consistent for across most indicators, specifically for the social capital indices. The results from the model presented below should only be used for comparison purposes only.

### *4.1.1 Food security and recovery*

Multivariate regression analysis is used to determine the degree to which social capital contributes to resilience as measured by household food security and recovery. To investigate whether households that have better access to different types of social capital were more resilient, the following equations are used:

$$HH\ Food\ Security = f\begin{pmatrix} \boldsymbol{Social\ capital\ (bonding, bridging, linking)}, \\ HH\ assets, HH\ human\ capital, HH\ individual\ power, \\ HH\ access\ to\ safety\ nets,\ HH\ livelihood\ profiles, \\ community\ characteristics,\ HH\ exposure\ to\ shocks \end{pmatrix} \quad 1$$

$$HH\ Recovery = f\begin{pmatrix} \boldsymbol{Social\ capital\ (bonding, bridging, linking)}, \\ HH\ assets, HH\ human\ capital, HH\ individual\ power, \\ HH\ access\ to\ safety\ nets,\ HH\ livelihood\ profiles, \\ community\ characteristics,\ HH\ exposure\ to\ shocks \end{pmatrix} \quad 2$$

These multivariate regression analyses investigate the impact of social capital on food security (equation 1) and recovery (equation 2) while controlling for all aspects of resilience capacity.[13] The resilience capacity index is deconstructed into its individual variables found in Figure 6. Those resilience variables that are captured under the indices for bonding, bridging and linking social capital are not included in the regression model to reduce the effects of multicollinearity on the individual predictors. These include the following community variables: access to infrastructure and access to basic services. Individual power is included in the analysis in lieu of the aspirations index.[14] The independent variables for the regressions include household demographic characteristics; number of adult equivalents[15], the% of household members in various age-sex groups, age of household head, female-headed household[16] and human capital. Livelihood profiles are also controlled for in this analysis.

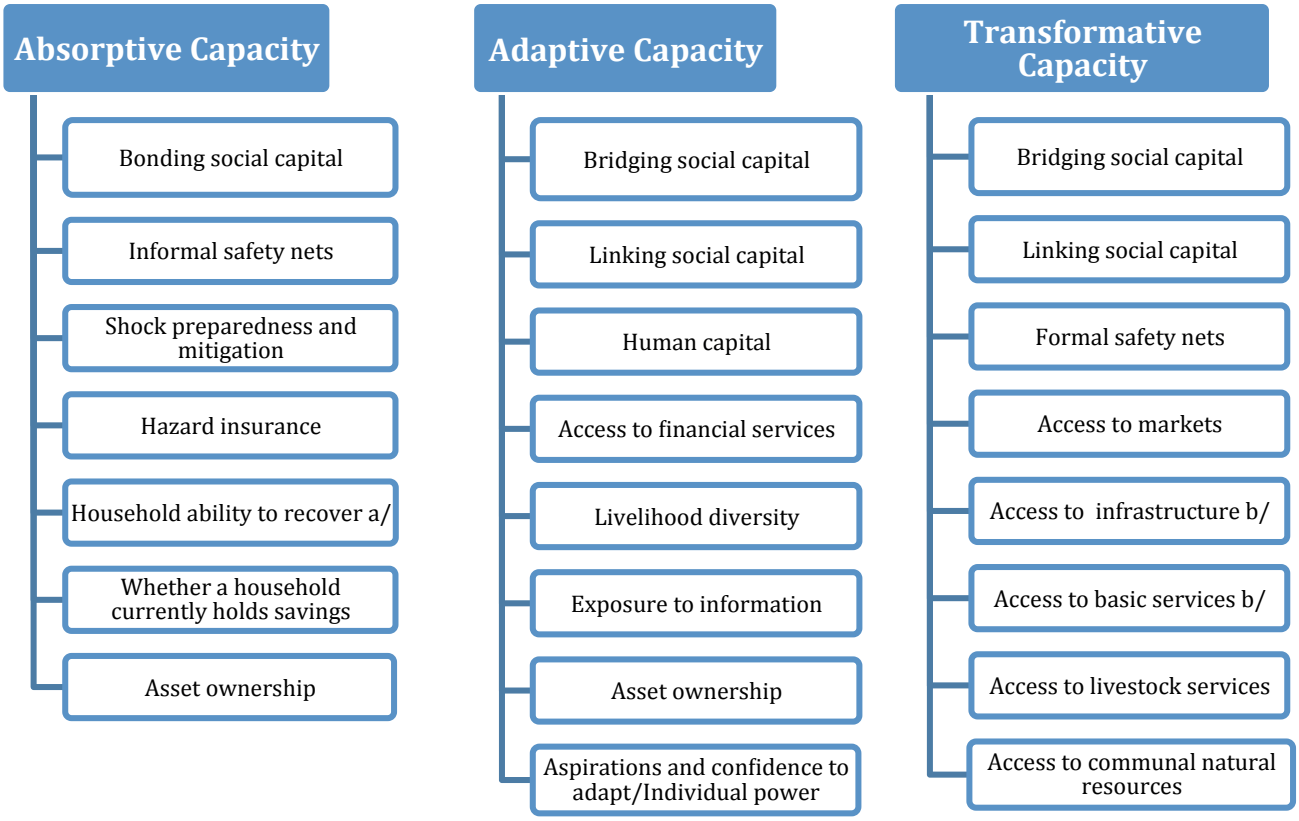
*[13] Excludes "household ability to recover" because it is an intermediate variable*

*[14] Analyses using the aspiration index and its subcomponents (sense of individual power, absence of fatalism, and exposure to alternatives to the status quo) show that only individual power has the greatest and significant impact on the dependent variables.*

*[15] For PRIME, number of adult equivalents squared is also included in the regression model.*

*[16] For PRIME, a dummy variable for households with only adult women is used in lieu of female-headed households.*

Figure 6. Aspects of resilience capacity




a/ intermidiate variable
b/ included in linking social capital index

# Annex 5
## PRIME baseline data

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## 5.1 Food security

Table 10. Relationship between social capital, household characteristics and household food security for PRIME baseline, Jijiga

| Indicator | Bonding social capital only | | Bridging social capital only | | Linking social capital only | | Elasticity a/ |
|---|---|---|---|---|---|---|---|
| **Social capital** | | | | | | | |
| Bonding social capital | 0.005 | | | | | | 0.030 |
| Bridging social capital | | | 0.015 | | | | 0.057 |
| Linking social capital | | | | | 0.025 | | 0.105 |
| **Household characteristics** | | | | | | | |
| Asset Index | 0.166 | *** | 0.179 | *** | 0.179 | *** | |
| Number of shocks | -1.457 | *** | -1.447 | *** | -1.451 | *** | |
| Human capital | 3.909 | *** | 3.832 | *** | 3.759 | *** | |
| HH adult equivalent | -0.617 | *** | -0.657 | *** | -0.646 | *** | |
| Age of HHH | 0.019 | | 0.018 | | 0.019 | | |
| Female only HH | -2.185 | * | -2.098 | * | -2.192 | * | |
| Number of observations | 1236 | | 1253 | | 1253 | | |

NOTES: Stars represent statistical significance at the 0.01 (***), 0.05 (**) and 0.1 (*) levels.
Community (kebele) fixed-effects regression. t-statistics are robust to heteroskedasticity.
a/ Elasticities are computed using coefficients from model D and mean values of variables. Exceptions are dummy variables (livelihood profiles and female-headed household) which are coded as 1 and 100.

Table 11. Relationship between social capital, household characteristics and household food security for PRIME baseline, Borena

| Indicator | Bonding social capital only | | Bridging social capital only | | Linking social capital only | | Elasticity a/ |
|---|---|---|---|---|---|---|---|
| **Social capital** | | | | | | | |
| Bonding social capital | 0.072 | *** | | | | | 0.732 |
| Bridging social capital | | | 0.054 | *** | | | 0.402 |
| Linking social capital | | | | | -0.005 | | -0.029 |
| **Household characteristics** | | | | | | | |
| Asset Index | 0.208 | *** | 0.205 | *** | 0.262 | *** | |
| Number of shocks | -0.843 | *** | -0.666 | *** | -0.724 | *** | |
| Human capital | 1.144 | * | 0.787 | | 1.096 | | |
| HH adult equivalent | -0.098 | | -0.057 | | -0.047 | | |
| Age of HHH | -0.012 | | -0.015 | | -0.023 | ** | |
| Female only HH | 0.113 | | -0.154 | | 0.025 | | |
| Number of observations | 1566 | | 1253 | | 1624 | | |

NOTES: Stars represent statistical significance at the 0.01 (***), 0.05 (**) and 0.1 (*) levels
Community (kebele) fixed-effects regression. t-statistics are robust to heteroskedasticity.
a/ Elasticities are computed using coefficients from model D and mean values of variables. Exceptions are dummy variables (livelihood profiles and female-headed household) which are coded as 1 and 100.

## 5.2 Recovery

Table 12. Relationship between social capital, household characteristics and recovery for PRIME baseline, Jijiga

| Indicator | Bonding social capital only | | Bridging social capital only | | Linking social capital only | | Elasticity a/ |
|---|---|---|---|---|---|---|---|
| **Social capital** | | | | | | | |
| Bonding social capital | 0.009 | *** | | | | | 0.212 |
| Bridging social capital | | | 0.007 | *** | | | 0.110 |
| Linking social capital | | | | | 0.043 | *** | 0.757 |
| **Household characteristics** | | | | | | | |
| Asset Index | 0.009 | | 0.013 | | 0.012 | | |
| Number of shocks | 0.040 | * | 0.036 | * | 0.033 | * | |
| Human capital | 0.681 | *** | 0.782 | *** | 0.631 | *** | |
| HH adult equivalent | -0.123 | *** | -0.129 | *** | -0.125 | *** | |
| Age of HHH | 0.002 | | 0.002 | | 0.001 | | |
| Female only HH | 0.056 | | 0.048 | | 0.016 | | |
| Number of observations | 1127 | | 1146 | | 1146 | | |

NOTES: Stars represent statistical significance at the 0.01 (***), 0.05 (**) and 0.1 (*) levels
Community (kebele) fixed-effects regression. t-statistics are robust to heteroskedasticity.
a/ Elasticities are computed using coefficients from model D and mean values of variables. Exceptions are dummy variables (livelihood profiles and female-headed household) which are coded as 1 and 100.

Table 13. Relationship between social capital, household characteristics and recovery for PRIME baseline, Borena

| Indicator | Bonding social capital only | | Bridging social capital only | | Linking social capital only | | Elasticity a/ |
|---|---|---|---|---|---|---|---|
| **Social capital** | | | | | | | |
| Bonding social capital | 0.005 | *** | | | | | 0.152 |
| Bridging social capital | | | -0.002 | * | | | -0.041 |
| Linking social capital | | | | | 0.004 | | 0.073 |
| **Household characteristics** | | | | | | | |
| Asset Index | -0.011 | ** | -0.007 | | -0.009 | * | |
| Number of shocks | 0.077 | *** | 0.077 | *** | 0.077 | *** | |
| Human capital | 0.272 | *** | 0.264 | *** | 0.200 | ** | |
| HH adult equivalent | -0.024 | | -0.010 | | -0.007 | | |
| Age of HHH | -0.003 | | -0.004 | ** | -0.004 | ** | |
| Female only HH | -0.106 | | -0.109 | | -0.109 | | |
| Number of observations | 1430 | | 1476 | | 1476 | | |

NOTES: Stars represent statistical significance at the 0.01 (***), 0.05 (**) and 0.1 (*) levels.
Community (kebele) fixed-effects regression. t-statistics are robust to heteroskedasticity.
a/ Elasticities are computed using coefficients from model D and mean values of variables. Exceptions are dummy variables (livelihood profiles and female-headed household) which are coded as 1 and 100.

## 5.3 Wealth analysis

Table 14. Mean values of bonding, bridging and linking social capital indices for households receiving/giving of money or food assistance, Jijiga

| Indicator | Wealth terciles | | | | | | |
|---|---|---|---|---|---|---|---|
| | Poor a/ | *n* | Middle | | *n* | Non-poor | | *n* |
| **Receiving money or food assistance** | | | | | | | | |
| Bonding social capital | 59.7 | *298* | 63.8 | | *285* | 68.2 | *** | *133* |
| Bridging social capital | 41.1 | *302* | 42.8 | | *286* | 47.5 | * | *135* |
| Linking social capital | 31.7 | *302* | 32.9 | | *286* | 31.3 | | *135* |
| **Giving money or food assistance** | | | | | | | | |
| Bonding social capital | 66.8 | *220* | 68.5 | | *249* | 70.3 | | *124* |
| Bridging social capital | 50.9 | *223* | 48.5 | | *252* | 48.0 | | *127* |
| Linking social capital | 31.0 | *223* | 33.7 | * | *252* | 31.0 | | *127* |

NOTES: Stars represent statistical significance at the 0.01 (***), 0.05 (**) and 0.1 (*) levels
a/ indicates dummy variable

Table 15. Mean values of bonding, bridging and linking social capital indices for households receiving/giving of money or food assistance, Borena

| Indicator | Wealth terciles | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Poor a/ | *n* | Middle | | *n* | Non-poor | | *n* |
| **Receiving money or food assistance** | | | | | | | | |
| Bonding social capital | 74.3 | *263* | 84.7 | *** | *364* | 85.4 | *** | *599* |
| Bridging social capital | 50.5 | *271* | 60.7 | *** | *374* | 70.1 | *** | *626* |
| Linking social capital | 42.3 | *270* | 44.0 | | *374* | 48.3 | *** | *626* |
| **Giving money or food assistance** | | | | | | | | |
| Bonding social capital | 85.2 | *173* | 87.6 | | *327* | 88.2 | * | *549* |
| Bridging social capital | 62.0 | *176* | 64.7 | | *335* | 71.6 | *** | *572* |
| Linking social capital | 43.4 | *176* | 44.9 | | *335* | 48.3 | ** | *572* |

NOTES: Stars represent statistical significance at the 0.01 (***), 0.05 (**) and 0.1 (*) levels.
a/ indicates dummy variable

# Annex 6
PRIME IMS data

## 6.1 Resilience capacity

Table 16. Effect of resilience capacity and index sub-components on changes in food security over the drought period

| Shock measure: | Change in rainfall deficit from baseline to R1 | | | 12-month rainfall deviation from norm at R1 | | | Cumulative (net) rainfall deficit from baseline to R1 | | | Change in soil moisture deficit from baseline to R1 | | | Cumulative soil moisture deficit from baseline to R1 | | | Perceptions-based drought exposure index (Kebele fixed-effects), R1 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | All | Borena | Jijiga | All | Borena | Jijiga | All | Borena | Jijiga | All | Borena | Jijiga | All | Borena | Jijiga | All | Borena | Jijiga |
| **Absorptive capacity** | | 5% | | | 1% | | | 1% | | | 5% | | | 1% | | | 10% | |
| Bonding social capital | | 10% | | | 5% | | | 5% | | | 5% | | | 5% | | | 10% | |
| Access to informal safety nets | | 5% | 5% | | 10% | | | 10% | 10% | | 5% | 5% | | 5% | 5% | | | |
| Holdings of savings | | | | | | | | | | | | | | | | | | 10% |
| **Adaptive capacity** | | | | | | | | | | | | | | | | | 10% | |
| Bonding social capital | | 10% | | | 5% | | | 5% | | | 5% | | | 5% | | | 10% | |
| Linking social capital | | | | | | | | | | | | | | | | | | |
| Human capital | | 5% | | | 5% | | | 5% | | | 5% | | | 5% | | | 1% | 10% |
| Aspirations/confidence to adapt | | | | | | | | | | | | | | | | | | |
| Exposure to information | | | | | | | | | | | | | | | | | | |
| Livelihood diversity | | | | | | | | | | | | | | | | | | |
| Access to financial resources | | | | | 5% | | | | | | 10% | | | | | | | |
| **Transformative capacity** | | | | | | | | | | | | | | | | | | |
| Bridging social capital | | 10% | | | 10% | | | 10% | | 10% | | | 10% | | | 10% | | |
| Linking social capital | | | | | | | | | | | | | | | | | | |
| Access to ….formal safety nets | | | | | | | | | | | | | | | | 10% | | |
| ….markets | | 5% | | | | | | 10% | | | | | | 5% | | | 5% | 1% |
| ….infrastructure | | | | | | | | | | | | | | | | | 10% | |
| ….basic services | 5% | | | 5% | | | 5% | | | 10% | | | 5% | | | | 5% | |
| ….communal natural resources | | | | | 10% | | | 10% | 5% | 10% | | | | 5% | 5% | | | |
| ….livestock resources | | | | | | | | | | | | | | | | | | |

Note: Percentages in boxes are significance levels associated with each measure in the first column. Red-shaded cells indicate a positive, statistically significant coefficient at least at the 10% level. Purple-shaded cells indicate a negative coefficient at least at the 10% level.

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# Annex 7
## BRACED data

### 7.1 Food security

Table 17. Relationship between social capital, household characteristics and household food security for BRACED, Karamoja

| Indicator | Bonding social capital only | | Bridging social capital only | | Linking social capital only | | Elasticity a/ |
|---|---|---|---|---|---|---|---|
| **Social capital** | | | | | | | |
| Bonding social capital | 0.378 | *** | | | | | 0.518 |
| Bridging social capital | | | 0.387 | *** | | | 0.513 |
| Linking social capital | | | | | 0.446 | | 0.573 |
| **Household characteristics** | | | | | | | |
| Wealth (asset) index | 0.518 | *** | 0.493 | *** | 0.523 | *** | |
| Number of shocks | -0.424 | *** | -0.423 | *** | -0.391 | *** | |
| Human capital | 0.246 | *** | 0.264 | *** | 0.313 | *** | |
| HH size | -2.200 | *** | -2.070 | *** | -2.912 | *** | |
| Age of HHH | -0.168 | ** | -0.164 | ** | -0.116 | | |
| Female-headed HH | -0.035 | | -0.032 | | -0.082 | *** | |
| Number of observations | 531 | | 531 | | 531 | | |

NOTES: Stars represent statistical significance at the 0.01 (***), 0.05 (**) and 0.1 (*) levels
Community (kebele) fixed-effects regression. t-statistics are robust to heteroskedasticity.
a/ Elasticities are computed using coefficients from model D and mean values of variables. Exceptions are dummy variables (livelihood profiles and female-headed household) which are coded as 1 and 100.

Table 18. Relationship between social capital, household characteristics and household food security for BRACED, Wajir

| Indicator | Bonding social capital only | | Bridging social capital only | | Linking social capital only | | Elasticity a/ |
|---|---|---|---|---|---|---|---|
| **Social capital** | | | | | | | |
| Bonding social capital | -0.046 | | | | | | -0.017 |
| Bridging social capital | | | -0.033 | | | | -0.010 |
| Linking social capital | | | | | -1.674 | *** | -0.807 |
| **Household characteristics** | | | | | | | |
| Wealth (asset) index | 0.513 | *** | 0.507 | *** | 0.517 | *** | |
| Number of shocks | -0.574 | *** | -0.571 | *** | -0.560 | *** | |
| Human capital | 0.291 | *** | 0.292 | *** | 0.316 | *** | |
| HH size | -1.374 | *** | -1.393 | *** | -1.472 | *** | |
| Age of HHH | -0.082 | | -0.078 | | -0.081 | | |
| Female-headed HH | -0.018 | | -0.019 | | -0.020 | | |
| Number of observations | 545 | | 545 | | 544 | | |

NOTES: Stars represent statistical significance at the 0.01 (***), 0.05 (**) and 0.1 (*) levels.
Community (kebele) fixed-effects regression. t-statistics are robust to heteroskedasticity.
a/ Elasticities are computed using coefficients from model D and mean values of variables. Exceptions are dummy variables (livelihood profiles and female-headed household) which are coded as 1 and 100.

Table 19. Relationship between social capital, resilience capacity, other aspects of food security and household food security, Karamoja

| Indicators | Only bonding social capital (A) | | Only bridging social capital (B) | | Only linking social capital (C) | | All three types of social capital, controlling for other aspects of resilience capacity (D) | | Elasticity |
|---|---|---|---|---|---|---|---|---|---|
| **Social capital** | | | | | | | | | |
| Bonding social capital | 0.554 | *** | | | | | 0.195 | * | 0.27 |
| Bridging social capital | | | 0.549 | *** | | | 0.342 | *** | 0.45 |
| Linking social capital | | | | | -0.219 | *** | -0.178 | *** | -0.23 |
| **Other aspects of resilience capacity** | | | | | | | | | |
| Informal safety nets | -0.186 | ** | -0.190 | ** | -0.046 | | -0.207 | ** | -0.22 |
| Shock preparedness and mitigation | -0.076 | | -0.071 | | -0.082 | | 0.004 | | 0.00 |
| Whether a HH currently holds savings | 0.030 | | 0.021 | | 0.049 | | 0.026 | | 0.00 |
| Access to financial resources | 0.070 | ** | 0.080 | *** | 0.087 | ** | 0.074 | ** | 0.12 |
| Aspirations index | -0.161 | *** | -0.160 | *** | -0.217 | *** | -0.172 | *** | -0.24 |
| Formal safety nets | 0.135 | ** | 0.145 | ** | 0.081 | | 0.162 | ** | 0.16 |
| Access to markets | 0.036 | | 0.041 | | -0.015 | | 0.076 | ** | 0.10 |
| Access to communal natural resources | -0.045 | | -0.086 | | -0.088 | | -0.024 | | -0.05 |
| Access to livestock services | -20.640 | ** | -22.686 | ** | -61.282 | *** | -29.329 | *** | -0.04 |
| Livelihood diversity | -0.437 | | -0.440 | | -0.038 | | -0.523 | * | -0.14 |
| **Livelihood profiles** | | | | | | | | | |
| Climate a/ | | | | | | | | | |
| Climate + economic | -0.012 | | 0.000 | | -0.021 | | 0.001 | | 0.00 |
| Climate + remittances | 0.123 | * | 0.119 | * | 0.253 | *** | 0.112 | * | 0.00 |
| Climate + economic +remittances | 0.158 | * | 0.126 | | 0.094 | | 0.125 | | 0.00 |
| Remittances + economic, no climate | 0.405 | ** | 0.400 | ** | 0.300 | | 0.380 | ** | 0.01 |
| Remittances only | -0.091 | | -0.084 | | -0.046 | | -0.116 | | 0.00 |
| Economic only | 0.161 | *** | 0.183 | *** | -0.005 | | 0.205 | *** | 0.00 |
| **Other determinants of food security** | | | | | | | | | |
| Asset Index | 0.512 | *** | 0.502 | *** | 0.633 | *** | 0.381 | *** | 0.08 |
| Shock exposure | -0.566 | *** | -0.551 | *** | -0.642 | *** | -0.809 | * | -0.54 |
| Human capital | 0.056 | | 0.113 | | 0.292 | *** | 0.064 | * | 0.01 |
| HH size | -0.553 | | -0.594 | | -1.504 | ** | -0.900 | * | -0.11 |
| Age of HHH | -0.142 | | -0.136 | | -0.049 | | -0.059 | * | -0.06 |
| Female-headed HH | 0.005 | | 0.014 | | -0.089 | *** | 0.011 | | 0.00 |
| Percent Age/Sex a/ | | | | | | | | | |
| %Male 16-30 | -0.078 | | -0.104 | | -0.195 | * | -0.097 | | -0.03 |
| %Male 30+ | -0.027 | | 0.003 | | -0.387 | *** | 0.026 | | 0.01 |
| %Female 0-16 | 0.006 | | 0.003 | | -0.102 | | -0.007 | | 0.00 |
| %Female 16-30 | 0.062 | | 0.049 | | 0.045 | | 0.088 | | 0.04 |
| %Female 30+ | -0.035 | | -0.065 | | 0.084 | | -0.084 | | -0.03 |
| Number of observations | 525 | | 427 | | 427 | | 423 | | |
| R squared | 0.570 | | 0.576 | | 0.315 | | 0.594 | | |
| Adjusted R squared | 0.539 | | 0.546 | | 0.266 | | 0.562 | | |

NOTES: Stars represent statistical significance at the 0.01 (***), 0.05 (**) and 0.1 (***) levels

a/ Indicates dummy variable used for comparison within categorical data output. Comparison group for livelihood profiles is climate only.

## 7.2 Recovery

Table 20. Relationship between social capital, household characteristics and recovery for BRACED, Karamoja

| Indicator | Bonding social capital only | | Bridging social capital only | | Linking social capital only | | Elasticity a/ |
|---|---|---|---|---|---|---|---|
| **Social capital** | | | | | | | |
| Bonding social capital | 0.003 | *** | | | | | 0.112 |
| Bridging social capital | | | 0.003 | *** | | | 0.122 |
| Linking social capital | | | | | 0.038 | *** | 1.325 |
| **Household characteristics** | | | | | | | |
| Wealth (asset) index | 0.009 | *** | 0.009 | *** | 0.008 | *** | |
| Number of shocks | -0.006 | ** | -0.006 | ** | -0.004 | | |
| Human capital | 0.006 | *** | 0.006 | *** | 0.006 | ** | |
| HH size | -0.007 | | -0.005 | | -0.019 | | |
| Age of HHH | -0.003 | | -0.003 | | -0.004 | * | |
| Female-headed HH | 0.000 | | 0.000 | | -0.001 | | |
| Number of observations | 549 | | 549 | | 549 | | |

NOTES: Stars represent statistical significance at the 0.01 (***), 0.05 (**) and 0.1 (*) levels.
Community (kebele) fixed-effects regression. t-statistics are robust to heteroskedasticity.
a/ Elasticities are computed using coefficients from model D and mean values of variables. Exceptions are dummy variables (livelihood profiles and female-headed household) which are coded as 1 and 100.

Table 21. Relationship between social capital, household characteristics and recovery for BRACED, Wajir

| Indicator | Bonding social capital only | | Bridging social capital only | | Linking social capital only | | Elasticity a/ |
|---|---|---|---|---|---|---|---|
| **Social capital** | | | | | | | |
| Bonding social capital | 0.009 | ** | | | | | 0.103 |
| Bridging social capital | | | 0.003 | | | | 0.026 |
| Linking social capital | | | | | -0.045 | | -0.664 |
| **Household characteristics** | | | | | | | |
| Wealth (asset) index | 0.020 | ** | 0.021 | ** | 0.022 | *** | |
| Number of shocks | -0.038 | *** | -0.038 | *** | -0.037 | *** | |
| Human capital | 0.002 | | 0.002 | | 0.003 | | |
| HH size | -0.042 | | -0.037 | | -0.037 | | |
| Age of HHH | -0.017 | ** | -0.018 | *** | -0.019 | *** | |
| Female-headed HH | -0.001 | | -0.001 | | -0.001 | | |
| Number of observations | 547 | | 547 | | 546 | | |

NOTES: Stars represent statistical significance at the 0.01 (***), 0.05 (**) and 0.1 (*) levels.
Community (kebele) fixed-effects regression. t-statistics are robust to heteroskedasticity.
a/ Elasticities are computed using coefficients from model D and mean values of variables. Exceptions are dummy variables (livelihood profiles and female-headed household) which are coded as 1 and 100.

Table 22. Relationship between social capital, resilience capacity, other aspects of food security and household recovery for BRACED, Karamoja

| Indicators | Only bonding social capital (A) | | Only bridging social capital (B) | | Only linking social capital (C) | | All three types of social capital, controlling for other aspects of resilience capacity (D) | | Elasticity |
|---|---|---|---|---|---|---|---|---|---|
| **Social capital** | | | | | | | | | |
| Bonding social capital | 0.003 | *** | | | | | -0.002 | | -0.057 |
| Bridging social capital | | | 0.004 | *** | | | 0.005 | * | 0.190 |
| Linking social capital | | | | | -0.001 | | -0.001 | | -0.023 |
| **Livelihood profiles** | | | | | | | | | |
| Climate only a/ | | | | | | | | | |
| Remittances only | -0.454 | | -0.420 | | -0.585 | * | -0.414 | | -0.266 |
| Economic only | 0.191 | | 0.220 | | 0.089 | | 0.231 | | 0.148 |
| Climate + remittances | 1.685 | *** | 1.688 | *** | 1.781 | *** | 1.708 | *** | 1.097 |
| Climate + economic | -0.009 | | 0.004 | | -0.017 | | 0.011 | | 0.007 |
| Remittances + economic, no climate | n/a | | n/a | | n/a | | n/a | | n/a |
| Climate + economic + remittances | 0.284 | | 0.255 | | 0.235 | | 0.255 | | 0.164 |
| **Other aspects of resilience capacity** | | | | | | | | | |
| Informal safety nets | -0.004 | | -0.004 | | -0.004 | | -0.004 | | -0.108 |
| Shock preparedness and mitigation | 0.001 | | 0.001 | | 0.001 | | 0.001 | | 0.021 |
| Whether a household currently holds savings | 0.001 | | 0.000 | | 0.001 | | 0.000 | | 0.000 |
| Access to financial resources | 0.002 | ** | 0.002 | ** | 0.002 | ** | 0.002 | ** | 0.001 |
| Individual power | 0.000 | | -0.001 | | 0.001 | | -0.001 | | -0.016 |
| Formal safety nets | 0.001 | | 0.001 | | 0.001 | | 0.001 | | 0.025 |
| Access to markets | -0.001 | | -0.001 | | -0.001 | | -0.001 | | -0.037 |
| Access to communal natural resources | -0.003 | | -0.003 | | -0.003 | | -0.003 | | -0.174 |
| Livelihood diversity | -0.004 | | -0.005 | | -0.004 | | -0.005 | | -0.034 |
| Access to livestock services | -0.021 | | -0.023 | | -0.040 | | -0.030 | | -0.007 |
| **Other determinants of food security** | | | | | | | | | |
| Wealth Index | 0.009 | *** | 0.009 | *** | 0.010 | *** | 0.009 | *** | 0.049 |
| Number of shocks | -0.008 | *** | -0.008 | *** | -0.008 | *** | -0.008 | *** | -0.150 |
| Human capital | 0.005 | ** | 0.005 | ** | 0.006 | ** | 0.005 | ** | 0.031 |
| Household adult equivalent | 0.002 | | 0.002 | | -0.004 | | 0.002 | | 0.006 |
| Age of household head | 0.001 | | 0.001 | | 0.001 | | 0.001 | | 0.029 |
| Female only households | 0.000 | | 0.000 | | -0.001 | | 0.000 | | 0.000 |
| Percent Age/Sex a/ | | | | | | | | | |
| %Male 16-30 | -0.002 | | -0.002 | | -0.003 | | -0.002 | | -0.017 |
| %Male 30+ | -0.002 | | -0.001 | | -0.004 | | -0.001 | | -0.008 |
| %Female 0-16 | 0.000 | | 0.001 | | -0.001 | | 0.000 | | 0.007 |
| %Female 16-30 | 0.003 | | 0.003 | | 0.003 | | 0.003 | | 0.036 |
| %Female 30+ | -0.002 | | -0.002 | | -0.001 | | -0.002 | | -0.020 |
| Number of observations | 541 | | 541 | | 541 | | 541 | | |

NOTES: Stars represent statistical significance at the 0.01 (***), 0.05 (**) and 0.1 (*) levels.
a/ Indicates dummy variable used for comparison within categorical data output.

Table 23. Relationship between social capital, resilience capacity, other aspects of food security and household recovery for BRACED, Wajir

| Indicators | Only bonding social capital (A) | | Only bridging social capital (B) | | Only linking social capital (C) | | All three types of social capital, controlling for other aspects of resilience capacity (D) | | Elasticity |
|---|---|---|---|---|---|---|---|---|---|
| **Social capital** | | | | | | | | | |
| Bonding social capital | 0.007 | | | | | | 0.018 | ** | 0.213 |
| Bridging social capital | | | 0.000 | | | | -0.014 | * | -0.123 |
| Linking social capital | | | | | 0.027 | *** | 0.027 | *** | 0.487 |
| **Livelihood profiles** | | | | | | | | | |
| Climate only a/ | | | | | | | | | |
| Remittances only | -0.436 | | -0.533 | | -0.435 | | -0.294 | | -0.135 |
| Economic only | 0.164 | | 0.190 | | 0.267 | | 0.291 | | 0.134 |
| Climate + remittances | 1.000 | | 1.012 | | 1.384 | ** | 1.473 | ** | 0.680 |
| Climate + economic | -0.744 | * | -0.786 | * | -0.705 | | -0.684 | | -0.316 |
| Remittances + economic, no climate | 2.359 | ** | 2.568 | ** | 2.279 | ** | 2.074 | * | 0.957 |
| Climate + economic + remittances | 0.262 | | 0.294 | | 0.440 | | 0.457 | | 0.211 |
| **Other aspects of resilience capacity** | | | | | | | | | |
| Informal safety nets | 0.005 | | 0.005 | | -0.004 | | -0.005 | | -0.170 |
| Shock preparedness and mitigation | 0.024 | * | 0.030 | ** | 0.039 | *** | 0.029 | ** | 0.097 |
| Whether a household currently holds savings | 0.393 | | 0.426 | | -0.101 | | -0.103 | | -0.047 |
| Access to financial resources | 0.002 | | 0.002 | | -0.007 | | -0.006 | | -0.003 |
| Individual power | -0.021 | | -0.012 | | -0.014 | | -0.019 | | -0.184 |
| Formal safety nets | 0.030 | *** | 0.030 | *** | 0.021 | *** | 0.020 | *** | 0.441 |
| Access to markets | -0.007 | * | -0.006 | * | -0.014 | *** | -0.015 | *** | -0.472 |
| Access to communal natural resources | 0.095 | *** | 0.095 | *** | 0.117 | *** | 0.117 | *** | 4.874 |
| Livelihood diversity | 0.037 | | 0.042 | | 0.027 | | 0.026 | | 0.091 |
| Access to livestock services | n/a | | n/a | | n/a | | n/a | | n/a |
| **Other determinants of food security** | | | | | | | | | |
| Wealth Index | 0.025 | *** | 0.027 | *** | 0.023 | ** | 0.021 | ** | 0.130 |
| Number of shocks | -0.035 | *** | -0.035 | *** | -0.036 | *** | -0.035 | *** | -0.459 |
| Human capital | 0.004 | | 0.005 | | 0.007 | | 0.007 | | 0.028 |
| Household adult equivalent | -0.051 | | -0.053 | | -0.048 | | -0.048 | | -0.155 |
| Age of household head | -0.017 | ** | -0.017 | ** | -0.019 | ** | -0.018 | ** | -0.412 |
| Female only households | 0.000 | | 0.000 | | -0.001 | | -0.001 | | 0.000 |
| Percent Age/Sex a/ | | | | | | | | | |
| %Male 16-30 | -0.005 | | -0.007 | | -0.006 | | -0.005 | | -0.024 |
| %Male 30+ | -0.003 | | -0.005 | | -0.003 | | 0.000 | | -0.003 |
| %Female 0-16 | 0.006 | | 0.006 | | 0.005 | | 0.005 | | 0.057 |
| %Female 16-30 | 0.000 | | -0.001 | | -0.003 | | -0.003 | | -0.020 |
| %Female 30+ | -0.001 | | -0.002 | | -0.002 | | -0.001 | | -0.004 |
| Number of observations | 532 | | 532 | | 532 | | 532 | | |

NOTES: Stars represent statistical significance at the 0.01 (***), 0.05 (**) and 0.1 (*) levels.
a/ Indicates dummy variable used for comparison within categorical data output.

Table 24. Mean values of bonding, bridging and linking social capital indices for households receiving/giving of money or food assistance, Karamoja

| Indicator | Wealth terciles | | | | | | |
|---|---|---|---|---|---|---|---|
| | Poor a/ | *n* | Middle | | *n* | Non-poor | *n* |
| **Receiving money or food assistance** | | | | | | | |
| Bonding social capital | 61.7 | 158 | 63.4 | | 158 | 67.9 * | 158 |
| Bridging social capital | 60.0 | 161 | 62.1 | | 161 | 64.8 | 161 |
| Linking social capital | 52.4 | 165 | 51.5 | | 165 | 56.2 | 165 |
| **Giving money or food assistance** | | | | | | | |
| Bonding social capital | 32.3 | 132 | 30.8 | | 132 | 31.1 | 132 |
| Bridging social capital | 69.5 | 150 | 65.5 | | 150 | 63.9 * | 150 |
| Linking social capital | 51.09 | 168 | 51.7 | | 168 | 56.7 | 168 |

NOTES: Stars represent statistical significance at the 0.01 (***), 0.05 (**) and 0.1 (*) levels.
a/ indicates dummy variable

Table 25. Mean values of bonding, bridging and linking social capital indices for households receiving/giving of money or food assistance, Wajir

| Indicator | Wealth terciles | | | | | | |
|---|---|---|---|---|---|---|---|
| | Poor a/ | *n* | Middle | | *n* | Non-poor | *n* |
| **Receiving money or food assistance** | | | | | | | |
| Bonding social capital | 25.2 | 126 | 34.7 | *** | 126 | 41.2 *** | 126.0 |
| Bridging social capital | 19.8 | 131 | 27.0 | ** | 131 | 32.9 *** | 130.0 |
| Linking social capital | 41.0 | 129 | 25.8 | *** | 129 | 38.0 | 129.0 |
| **Giving money or food assistance** | | | | | | | |
| Bonding social capital | 41.9 | 42 | 51.5 | ** | 42 | 46.0 | 42.0 |
| Bridging social capital | 28.6 | 71 | 40.3 | ** | 71 | 35.2 | 71.0 |
| Linking social capital | 49.9 | 106 | 26.6 | ** | 106 | 41.8 | 106.0 |

NOTES: Stars represent statistical significance at the 0.01 (***), 0.05 (**) and 0.1 (*) levels.
a/ indicates dummy variable

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