



PARTNERSHIP FOR  
RESILIENCE AND  
ECONOMIC GROWTH IN  
NORTHERN KENYA

# PREG

ENDLINE REPORT

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## LIST OF ACRONYMS

<b>ADESO</b>	African Development Solutions
<b>ASAL</b>	Arid and semi-arid lands
<b>EA</b>	Enumeration Area
<b>DID</b>	Difference in Differences
<b>FGD</b>	Focus Group Discussion
<b>FTF</b>	Feed the Future
<b>GDP</b>	Gross Domestic Product
<b>GoK</b>	Government of Kenya
<b>HA</b>	Humanitarian Assistance
<b>HHS</b>	Household Hunger Scale
<b>IE</b>	Impact Evaluation
<b>KII</b>	Key Informant Interview
<b>KSh</b>	Kenyan Shilling
<b>NDMA</b>	National Drought Management Authority
<b>NGO</b>	Non-Governmental Organization
<b>PBS</b>	Population-Based Survey
<b>PPP</b>	Purchasing Power Parity
<b>PREG</b>	Partnership for Resilience and Economic Growth
<b>REAL</b>	Resilience Evaluation, Analysis and Learning
<b>REGAL</b>	Resilience and Economic Growth in the Arid Lands
<b>TANGO</b>	Technical Assistance to Non-Governmental Organizations
<b>USAID</b>	United States Agency for International Development
<b>USD</b>	United States Dollar
<b>VSLA</b>	Village Savings and Loan Association
<b>ZOI</b>	Zone of Influence

## EXECUTIVE SUMMARY

In Kenya, 23 of 47 counties are considered arid and semi-arid lands (ASALs). Many constraints have and continue to negatively impact the resilience, food security situation and socio-economic development of the ASALs of Kenya. Counties in the ASAL region have been adversely impacted by a legacy of marginalization by the government, drought emergencies, human conflict, and poverty. USAID's Partnership for Resilience and Economic Growth (PREG) brings together multiple humanitarian and development partners that work with the Kenya National Drought Management Authority (NDMA) and county governments to coordinate resilience and economic growth activities to strengthen resilience among the vulnerable pastoralist communities in nine ASAL counties.

As a mechanism for coordinating all resilience programming in the ASALs in northern Kenya, the PREG model of collaboration is grounded in sequencing, layering, and integrating interventions, which has enabled partners to minimize overlap, promote synergies, and achieve multi-partner collaboration. By 2014, USAID-supported resilience programs implemented in the ASALs in northern Kenya were subsumed under the PREG Partnership umbrella. This included the Resilience and Economic Growth in the Arid Lands (REGAL) projects: REGAL-Improving Resilience (REGAL-IR) and REGAL-Accelerated Growth (REGAL-AG). As a result, the PREG I endline survey draws heavily from the REGAL Impact Evaluation design, but with several significant adaptations.

The main body of this report presents findings from a pre-post analysis of PREG resilience programming activities for its first five-year phase (i.e., PREG I), which ostensibly represents a transition from REGAL to PREG.

### Study Design / Methods

As mentioned above, the PREG I study was originally designed as an impact evaluation of the REGAL project (i.e., REGAL-IR and REGAL-AG) in northern Kenya, which was designed to understand the differences in outcomes between households that received high-intensity (treatment group) and low-intensity (comparison group) resilience programming. Numerous issues emerged over the course of the transition from REGAL to PREG that made clear an impact evaluation—as originally designed—would not be possible; a key limitation was that some households within the treatment group had not, in fact, directly participated in program activities (i.e., had not received any treatment). Thus, PREG I endline study findings are based on a pre-post analysis, analyzing change over time to detect differences in key outcomes between baseline and endline surveys. Note that this pre-post study does not allow for attribution of benefits to PREG households from PREG programming.

Data for the PREG I baseline (originally the REGAL impact evaluation baseline) were captured by integrating resilience modules into the population-based survey for the Feed the Future Zone of Influence. The PREG I endline utilizes a mixed-methods design that includes both quantitative and qualitative components; the baseline involved quantitative data collection only. Baseline data were collected in January/February 2013 and endline data in August/September 2018 in six of the nine



counties in which PREG I operated, including Isiolo, Marsabit, Turkana, Mandera, Samburu, and Tana River.<sup>1</sup> The timing of data collection for the baseline occurred post-harvest. In contrast, data collection for the endline occurred during the lean season for pastoral areas. The timing of data collection should ideally be conducted at the same time of year for each survey round in order to more accurately assess the effects of programming (versus effects due to seasonality, for example) on any changes in food security that might occur over time.

Both the baseline and endline survey samples were drawn independently and use cross-sectional samples of the population within the PREG area of intervention. However, the definition of the PREG area of intervention changed between baseline and endline. The baseline sample was divided into two geographic strata defined at the county level and was based on planned PREG programming with low-intensity (LI) counties receiving only humanitarian assistance through the USAID-supported PREG partnership: Baringo, Samburu, and Tana River. High-intensity (HI) counties were defined as areas receiving (or that would receive) PREG resilience-enhancing investments in addition to humanitarian assistance: Isiolo, Marsabit, and Turkana. Based on guidance for Feed the Future Zone of Influence surveys, the samples drawn from the counties in these two strata were population-based, that is, all households within the counties constituted the sampling frame from which surveyed households were drawn. However, midline survey data showed that a large number of sampled households from the HI counties (treatment group) did not directly participate in any resilience programming supported by USAID, so the sampling strategy for the endline was modified.<sup>2</sup>

The sampling strategy for the endline survey was modified from the one used at baseline in order to address this sampling limitation. Rather than identifying the HI sampling frame on the basis of county only (i.e., as in the baseline), information from project records was used to identify much smaller geographic areas (sublocations) in which PREG projects had been carried out or were currently engaged in specific interventions at the time of the PREG I endline survey. The LI endline sampling frame was also changed from county level to sublocations within the LI counties where WFP-supported humanitarian assistance (and other non-resilience-building) activities had been carried out. As a result, the PREG I endline is a subset of the baseline sample; the subset consists of overlapping sublocations.

Because households sampled in the HI areas for the PREG I endline (i.e., at sublocations) were more likely to have been exposed to resilience interventions than HI sampled households for the PREG I baseline (i.e., at county level), the two populations are not comparable. Endline sublocations (at least in HI areas) reflect project selection criteria and therefore it is possible—and likely—that there would be systematic differences between the selected sublocations and the county as a whole. To mitigate this bias, the findings for the PREG I endline are based on a pre-post comparison of data from the purposively selected endline sublocations where data were also collected at baseline. In addition, a limited difference-in-differences impact analysis was conducted comparing baseline-to-endline changes in the overlapping HI sublocations with changes in the

<sup>1</sup> Due to security issues at baseline, data were not collected in Garissa, Mandera and Wajir counties. A mid-term survey was conducted in 2015 to collect point estimates of the Feed the Future Zone of Influence indicators, that sample was not powered to statistically measure changes from the baseline survey. Therefore, the mid-term survey information is not included in this endline report.

<sup>2</sup> Based on baseline and mid-term survey data about program participation. See Section 2.1.1 for more details.

overlapping LI sublocations. Qualitative insights help explain and provide more depth to the quantitative analyses.

### Key Findings<sup>3</sup>

**Livelihoods.** Livelihood diversity was generally low and decreased slightly over time, from approximately two sources of income or food, to one. While livestock production remained the primary livelihood, qualitative focus group participants across all counties reported increased interest in diversifying into small-scale farming and vegetable gardening. In multiple communities, however, drought, lack of sufficient water resources, and flooding in some cases (e.g., Garissa), have often undermined these efforts. The quantitative data show household participation in farming, wage labor and self-employment decreased significantly over time.

**Coping Strategies.** At endline, roughly 8 percent of households relied on migration to cope with shocks/stressors, a significant increase from baseline. Reliance on selling off both large and small assets decreased significantly since the baseline; selling of large assets remained a coping strategy at endline for 30 percent of households. Neither the quantitative nor the qualitative data provide sufficient insights into whether households shifted to more negative coping strategies over time, though this often occurs in cases of recurrent shocks requiring more dire action.

#### Resilience Capacities

**Social capital.** By endline, more households had, or thought they could, seek help from others than at baseline. Although relatives are still the primary sources of support in times of need, there was a significant increase in reaching out to non-relatives in other tribes and ethnic groups ( $p < 0.05$ ). The qualitative findings suggest this may be partly due to an erosion of bonding social capital (i.e., links between families, friends and neighbors within a household's community) over time, driving greater reliance on geographically distant sources of social support, such as bridging social capital (i.e., links between family, friends and neighbors outside a household's community) and linking social capital (i.e., vertical linkages to people with access to resources, such as leaders, political figures, business owners). The qualitative data also indicate that even wealthier households were greatly affected by recent shocks and incurred debt that inhibited their traditional role of providing loans, food and other support within their communities during times of need. Shop owners were less willing or able to allow people to purchase food on credit than in the past. This is consistent with other findings that the rate of borrowing dropped at endline.

**Humanitarian assistance.** Household reliance on humanitarian assistance was very low in both survey rounds: 15 percent at baseline and 6 percent at endline; the change over the two rounds is not statistically significant. The qualitative data suggest that most communities still received (although diminished) some form of assistance during times of crises, including food aid, cash, fodder, seedlings, vaccines, malaria nets, and livestock restocking. While some communities noted that this type of assistance was insufficient to meet the needs of households within an affected area (e.g., Wajir), others indicated that emergency humanitarian assistance layered with

<sup>3</sup> Findings are based on comparisons across time and not between HI and LO groups.

development activities was critical for dealing with shocks and stresses. A female FGD in Garissa, for example, described food assistance as critical to reducing “starvation” during drought.

**Asset ownership.** Households owned fewer assets at endline compared to baseline, but the decrease was not statistically significant.

#### Well-being Outcomes

**Economic indicators.** Household expenditures significantly decreased and poverty increased, although the latter change was not statistically significant.

**Food security.** Moderate or severe household hunger increased significantly over time. Some of this increase may be because the baseline data were collected in the post-harvest season (when we would expect hunger levels to be lower) and the endline data were collected in the lean season (when we would expect hunger to increase).

**Child nutritional status.** Generally, the trend was toward improvements in all three measures of child nutrition by endline, though no changes were statistically significant.

**Ability to cope (subjective resilience).** The perceived ability to cope with future shocks is also referred to as subjective resilience. The percentage of surveyed households who report that they are able to cope with future shocks or times of stress decreased significantly. Reliance on relief assistance is lower for households with greater reported ability to cope with future shocks. Households that report inability to cope with future shocks relied most heavily on natural-resource-based livelihoods (livestock and harvesting wild products) and wage labor, although at endline the difference with salaried labor was minimal. Those that reported ability to cope with future shocks with some adjustments had the most widely diversified portfolio of livelihoods, while the households that reported ability to cope without adjustments were more likely to focus on livestock livelihoods and salary work.

**Summary.** Most results at endline do not differ significantly from those collected at baseline. The lack of statistical significance overall may be related to the relatively small sample size. Insights from the qualitative data offer a somewhat more nuanced perspective; people are struggling but have some capacity—although diminished—to cope with shocks and stressors, particularly if afforded some external assistance. Some respondents reported improvements in livelihood diversification; improved nutrition among children; increased collective action and community cohesion, particularly as regards natural resource management; increased access to services (e.g., markets, veterinary and human health services) and technologies (e.g., farming practices); and improvements in and access to infrastructure (e.g., markets, water points).

Such seemingly contradictory results may, in part, reflect differences in the nature of the data reported; the quantitative results (primarily neutral or negative) reflect the average across all sampled households while the qualitative data (somewhat more positive) reflect the opinions and perspectives of a considerably smaller sample size of diverse but purposively selected key informants and focus group participants. Additionally, participants in focus groups or key informant interviews are asked to provide their perceptions of conditions in their communities

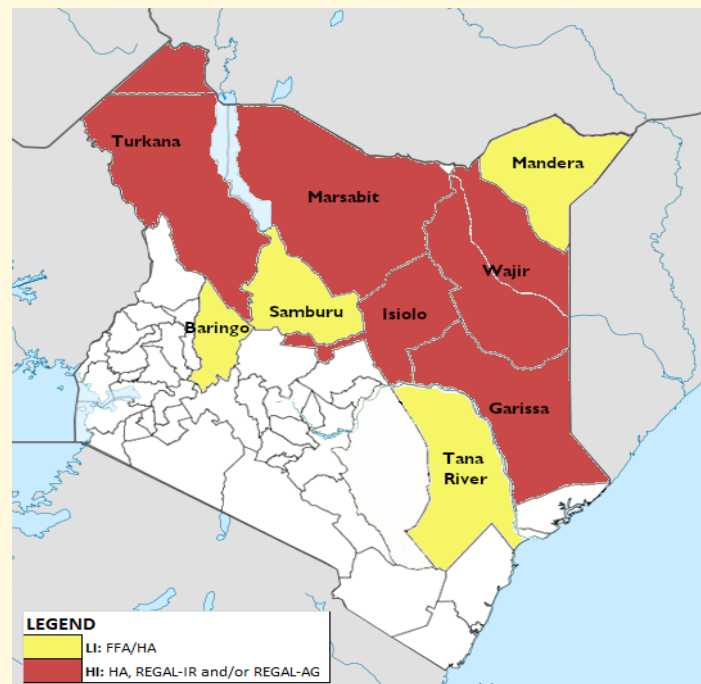
overall, whereas the information collected in quantitative surveys reflects the specific conditions of the respondents' households. The important point is that both the quantitative and qualitative results are valid even when seemingly contradictory; one must simply keep the context for each in mind when interpreting results. In particular, the qualitative results represent the opinions of the individuals who provided them and may not be broadly applicable beyond their community, in contrast to quantitative results.

# 1 INTRODUCTION

The USAID Partnership for Resilience and Economic Growth (PREG) program was formed as a collaborative and coordinated effort between the USAID Kenya and East Africa missions, and brings together humanitarian and development partners to build the resilience of vulnerable pastoralist communities in northern Kenya. The Partnership targets communities in nine of the arid and semi-arid land (ASAL) counties by layering and sequencing multiple USAID activities and implementing partners, and working with the Kenya National Drought Management Authority (NDMA) and county governments to coordinate resilience and economic growth activities.

This report presents findings from a study of the first five-year phase of PREG (PREG I) in Kenya's northern ASALs. The primary aim of the study is to document changes over the five-year period (2013–2018) in selected household resilience capacities, coping strategies, and well-being outcomes, including food security and “subjective resilience” (i.e., households' perceived ability to cope with future shocks) among households surveyed in Baringo, Isiolo, Marsabit, Turkana, Samburu, and Tana River (Figure 1).<sup>4</sup> Well-being is measured by four indicators: 1) daily per capita expenditures measured in 2010 U.S. dollars (USD) after adjusting for 2005 purchasing power parity (PPP); 2) prevalence of poverty (the percentage of households living on less than \$1.25 per day); 3) depth of poverty; 4) moderate to severe hunger (Household Hunger Scale); and 5) subjective resilience.

Figure 1: PREG I program areas in northern Kenya



Map Source: ©Nairobi123 (June 2013) / Kenya\_Updated\_location\_map.jpg / Wikimedia Commons / CC-BY-SA-3.0 / Original map has been modified.  
 FFA/HA = Food for Assets/Humanitarian Assistance  
 REGAL-IR and REGAL-AG are resilience projects brought under the PREG umbrella and on which the PREG I baseline is based.

<sup>4</sup> Due to security issues at baseline, data were not collected in Garissa, Manderu and Wajir counties. A mid-term survey was conducted in 2015 to collect point estimates of the Feed the Future Zone of Influence indicators, and was not powered to statistically measure changes from the baseline survey. Therefore, the mid-term survey information is not included in this endline report.

## 1.1 PROJECT AREA PROFILES

Prolonged and recurring drought (2008–2011, 2017, 2019), combined with localized vulnerabilities, represent key challenges affecting development progress in the northern ASALs.<sup>5</sup> In 2012, the USAID Feed the Future Resilience and Economic Growth in the Arid Lands (REGAL) program was initiated in five of the nine counties within USAID’s Zone of Influence (ZOI).

REGAL aimed to reduce poverty and hunger among vulnerable Kenyans in the northern ASALs through two five-year projects, REGAL-IR (Improved Resilience) and REGAL-AG (Accelerated Growth), implemented respectively by African Development Solutions (Adeso) and ACDI/VOCA. The REGAL-IR program sought to engage in broad investment to improve resilience of vulnerable households in Garissa, Isiolo, Marsabit, Turkana, and Wajir counties. Working with communities to build their capacity to cope with shocks, the interventions supported local structures to improve social, economic, and environmental resilience.<sup>6</sup> The REGAL-AG program provided additional investment in livestock value chains and connected pastoralists and agro-pastoralists to markets in two of the REGAL-IR counties (Isiolo and Marsabit).<sup>7</sup> Both programs were to be layered on top of humanitarian assistance programming implemented by USAID partners within the nine-county ZOI.

### USAID DEFINITION OF RESILIENCE

“THE ABILITY OF PEOPLE, HOUSEHOLDS, COMMUNITIES, COUNTRIES, AND SYSTEMS TO MITIGATE, ADAPT TO, AND RECOVER FROM SHOCKS AND STRESSES IN A MANNER THAT REDUCES CHRONIC VULNERABILITY AND FACILITATES INCLUSIVE GROWTH.”

The REGAL program, referred to as the 9-5-2 Club, initially involved USAID, World Food Programme (WFP), and REGAL (AG and IR). Its purpose was to “coordinate and harmonize USAID direct-funded resilience-building activities amongst key humanitarian and development actors in the arid and semi-arid lands in Kenya, in collaboration with the National Drought Management Authority and the devolved county government structures.”<sup>8</sup> By 2014, the original 9-5-2 Club had expanded its membership and transitioned to the Partnership for Resilience and Economic Growth (PREG), with a focus on bringing together humanitarian and development partners to “build resilience among pastoral communities in northern Kenya.” That is, REGAL was subsumed under the PREG umbrella and as such, the PREG I endline includes a final evaluation of the REGAL projects.

<sup>5</sup> USAID. 2016. USAID Partnership for Resilience and Economic Growth Learning Event. Accessed at: <https://www.africaleadftf.org/wp-content/uploads/2016/09/PREG-Learning-Event-Slide-Deck-Aug-2016.pdf>.

<sup>6</sup> See: [TOS Snapshot #xx Kenya \(usaid.gov\)](#).

<sup>7</sup> See: [TOS Snapshot #xx Kenya \(usaid.gov\)](#).

<sup>8</sup> USAID. 2016. USAID Partnership for Resilience and Economic Growth Learning Event. Accessed at: <https://www.africaleadftf.org/wp-content/uploads/2016/09/PREG-Learning-Event-Slide-Deck-Aug-2016.pdf>.

### 1.1.1 REGAL Theory of Change

To generate the economic growth needed to reduce poverty and hunger, and to achieve the Government of Kenya's (GoK's) vision of a commercial and modern agricultural sector, Feed the Future in Kenya has invested in transforming livestock production through improved competitiveness of high-potential value chains (e.g., milk, meat) and the promotion of diversification into higher-return activities. As documented by the International Food Policy Research Institute for maize in Ethiopia, the development of selected value chains can have multiplier effects that, in turn, can create employment opportunities.<sup>9</sup>

Value chain investment in livestock markets with lower risk and lower entry barriers has been one way of encouraging the participation of poorer rural households in expanding economic activities. Feed the Future in Kenya believed that while these investments in economic growth are necessary to reduce poverty and hunger, by themselves they would be insufficient. Beyond growth, poverty reduction requires targeted interventions that address the needs of agro-pastoralists (the rural poor) as well as more vulnerable populations, women and youth. REGAL interventions used both “push” and “pull” strategies to engage vulnerable households in market-oriented activities and promote economic growth (Figure 2). The value chain programs of REGAL-AG aimed to “pull” rural households into income-raising activities by improving links to markets and input access, providing affordable business development skills and financial services, and promoting greater diversification—specifically tailored to the needs of agro-pastoralists, women, and youth. Activities implemented under REGAL-IR were designed to “push” individuals toward increased engagement in markets through reduced risk, better nutrition, improved access to information and resources for small business entrepreneurship, and better access to and management of the natural resources on which many small businesses depend.

Figure 2: REGAL Theory of Change



<sup>9</sup> International Food Policy Research Institute (IFPRI). 2010. Maize Value Chain Potential in Ethiopia Constraints and Opportunities for Enhancing the System.

### 1.1.2 REGAL-IR

As the “push” project, the REGAL-IR aimed to reduce hunger and poverty by strengthening social, economic, and environmental resilience in pastoral and transitioning communities in Isiolo, Garissa, Wajir, Marsabit, and Turkana. Project goals were to:

- Improve capacity of individuals and community-based enterprises to become more competitive in business and non-pastoral activities;
- Support community structures to better manage natural resources and relieve pressure on the environment;
- Support community and entrepreneur access to market information and produce markets;
- Strengthen capacity to manage conflict; and
- Improve household consumption of nutritious foods.

REGAL-IR implemented activities and sought to strengthen social, economic and environmental resilience for 558,000 people (93,000 households), out of a total population of approximately 2.6 million in these counties in 2009,<sup>10</sup> through community engagement and strengthening of local institutions. Reported key accomplishments include working with 293 self-help groups, with a total of 6,701 members, including 4,816 women (72 percent).<sup>11</sup> Communities were able to leverage USD 12.7 million from the GoK and other development actors toward implementation of community development action plan (CDAP) activities; 77 CDAP oversight committees were formed, with a total of 1002 members, 35 percent of which are women. The activity also supports Sidai Africa, Ltd. Super Service Centers (SSCs), which provide animal health products and services in northern Kenya,<sup>12</sup> including establishing at least four SSCs and 18 franchises in Marsabit, Isiolo, Wajir and Turkana.

### 1.1.3 REGAL-AG

The REGAL-AG project goal was to increase economic growth and social stability in Marsabit and Isiolo counties by expanding and strengthening competitive livestock value chains and markets. Project goals were to:

- Improve the enabling environment for livestock value chain development;
- Improve market linkages and livestock productivity;
- Expand existing and develop new livestock service and input markets; and
- Expand livestock-related economic opportunities that engage and benefit men and [women](#).

<sup>10</sup> Kenya Open Data: <https://www.opendata.go.ke/datasets/4b8b2da624ba4cdf9cd38b5f359eef3/explore>.

<sup>11</sup> Accessed at: [https://www.usaid.gov/sites/default/files/documents/1860/REGAL\\_IR.pdf](https://www.usaid.gov/sites/default/files/documents/1860/REGAL_IR.pdf).

<sup>12</sup> Accessed at: <https://www.usaid.gov/sites/default/files/documents/1860/REGAL%20IR%20%20fact%20sheet%20August%202014.pdf>.



As the “pull” component, the REGAL-AG project made upgrades to 12 livestock markets, benefiting 24,597 rural households over the five-year project lifecycle, and constructed eight additional markets, which expanded market opportunities and helped to eliminate value chain constraints.<sup>13</sup> The project supported the establishment of 36 enterprises through business development grants, and 31 microenterprises and 17 small enterprises received business support services. Grants helped to identify and build the capacity of change agents within pastoral communities who could drive further investments, upgrades, and increased economic competitiveness. Finally, over 2,600 individuals were trained in agricultural sector productivity or food security.

## 1.2 DESCRIPTION OF THE PREG PROJECT CONTEXT

Kenya’s political, structural and economic reforms over the past decades have been successful in driving economic growth and progress towards sustainability goals.<sup>14</sup> The most recent and significant political reform involved a new constitution in 2010, which included a major provision for devolution to improve governance and services at local levels. The country experienced political uncertainty related to the 2017 presidential election and re-election along with a severe drought the same year, and growth in the gross domestic product (GDP) slowed to 4.9 percent.<sup>15</sup> GDP growth rebounded to 5.7 percent in 2018 and there has been significant recovery, though not evenly across sectors, in early 2021.<sup>16</sup>

Agriculture is a backbone of the country’s economy, key to national food security and to poverty reduction. The sector continues to be supported by the GoK, USAID, and development partners through a collaborative effort to improve agricultural and pastoralist markets and value chains. While urban and peri-urban areas of Kenya are growing, 73 percent of the population still lives in rural areas.<sup>17</sup>

Development challenges remain, as “Kenya’s reliance on smallholder, rain-fed agriculture and its high poverty rates render the country particularly vulnerable to climate risks,”<sup>18</sup> particularly in the ASALs of northern Kenya. Recurring and prolonged drought (e.g., 2008–2011, 2017, and 2019) continues to be one of several factors contributing to increasing vulnerability in northern Kenya. The drought in 2017 resulted in 3.6 million acutely food insecure people in the ASALs. The drought continued into 2019, with northern Kenya classified as “stressed” per the IPC Food Insecurity Phase Classification (IPC), with 700,000 people severely food insecure.<sup>19</sup> Other factors impacting rural development include population growth, natural resource degradation, land fragmentation, human and animal disease, and tribal conflict.

<sup>13</sup> See: <https://www.acdivoca.org/projects/resilience-and-economic-growth-in-the-arid-lands-accelerated-growth-PREG I-ag/>.

<sup>14</sup> World Bank. (2018). The World Bank in Kenya. April. Accessed at: <http://www.worldbank.org/en/country/kenya/overview>.

<sup>15</sup> World Bank. (2018). Press Release: Kenya’s Economy Poised to Rebound in 2018 and Remain Robust through 2020, 10 October.

<sup>16</sup> Ibid.

<sup>17</sup> World Bank. (2019). Data: Rural population (% of total population). Estimates based on the United Nations Population Division’s World Urbanization Prospects: 2018 Revision.

<sup>18</sup> World Bank Group. (2015). Kenya Agricultural Risk Assessment. Agriculture Global Practice Note 17, October.

<sup>19</sup> OCHA. (2019). Greater Horn of Africa Region Humanitarian Snapshot (November–December 2018), 31 January.

The main livelihood in PREG intervention areas is raising livestock, which is also important for the overall economy of Kenya. Livestock production contributes 13.4 percent (USD 3.1 billion) to agricultural value added in Kenya, with cattle being the most significant.<sup>20</sup> The beef industry is the number-one contributor to agricultural GDP in Kenya, at around 35 percent, followed by dairy cattle production,<sup>21</sup> with crop production being Kenya’s largest economic sector.<sup>22</sup> The PREG program area and surrounding counties provide the vast majority (approximately 80–90 percent) of Kenya’s beef,<sup>23</sup> and much of Kenya’s meat for export as well. Besides meat, Kenya exports live animals, milk, and animal hides and skins. In terms of long-term trends, Kenya’s total cattle population in semi-arid regions has decreased by more than 26 percent in the past 30 years, according to a recent study funded by the Canada-based International Development Research Centre and the UK Department for International Development, and Turkana County is the most harshly affected.<sup>24</sup> The study attributes this sharp decrease in cattle population to rising temperatures and reduced or unpredictable rainfall.

Table 1 and Table 2 show that cattle meat and cow milk are most important in terms of production and gross marketed production value from 2008–2017. However, camel meat and milk production and goat milk production have dramatically increased over the past 15 years, using 2002 as a reference point (Table 1). For instance, 18,000 tons of camel meat were produced in 2002, increasing to 73,000 tons in 2017.

Table 1: Kenya livestock production over past ten years plus past reference year (1,000 metric tons)

	2002 (ref.)	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>Meat, cattle</b>	319	458	483	462	458	411	425	443	487	529	589
<b>Meat, goat</b>	39	45	46	47	56	56	58	68	68	50	64
<b>Meat, sheep</b>	39	39	41	42	41	40	42	30	31	38	33
<b>Meat, camel</b>	18	75	62	65	65	65	66	60	66	70	73
<b>Milk, cow</b>	2,891	3,209	3,567	3,639	3,711	3,733	3,686	3,425	3,444	4,115	3,561
<b>Milk, goat</b>	104	136	258	260	263	268	269	280	260	274	256
<b>Milk, sheep</b>	58	57	57	58	60	61	62	63	62	70	67
<b>Milk, camel</b>	225	854	877	892	890	911	871	749	812	850	876

Source: FAOSTAT. 2019 (data from January 31, 2019). Based on FAO estimates and imputation methodology.

<sup>20</sup> KNBS. (2017). Kenya Economic Survey 2016.

<sup>21</sup> FAO. (2018). Africa Sustainable Livestock 2050: Kenya Cattle and Poultry Sectors. Livestock production systems spotlight.

<sup>22</sup> IGAD. (2013).

<sup>23</sup> Farmer, E. and J. Mbwika. (2012).

<sup>24</sup> Kenya Markets Trust. (2018). “Cattle Population in Decline in Arid Areas, but there are Opportunities to Explore—Study” 17 February. Accessed at: <http://www.kenyamarkets.org/press/cattle-population-in-decline-in-asals/>.

Table 2: Gross marketed production value of livestock products at current prices (KSh million), by year

Livestock and related products	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017*
Meat, cattle	22,834	24,057	31,893	48,943	54,141	58,237	59,273	66,217	84,701	93,630
Meat, goat, sheep, lamb	4,147	3,097	5,160	9,632	10,025	7,532	9,208	4,855	5,364	6,782
Meat, pigs	626	804	754	828	1,079	1,307	1,398	1,317	1,838	2,216
Poultry and eggs	2,789	4,345	5,012	5,553	6,482	7,086	7,441	6,006	8,788	10,675
Wool	4.9	1.8	3.1	3.3	2.9	2.9	0.8	0.2	0.2	0.3
Hides and skin	1,201	1,249	1,092	1,392	1,525	1,888	1,884	1,006	1,287	1,418
Dairy products	8,369	11,497	11,346	14,548	15,416	16,777	18,785	21,205	23,020	20,878

\* Provisional data

KNBS. Statistical Abstract. Reports from 2018, 2017, 2016, 2015.

As described in Section 1.1, PREG represents an expansion of the REGAL project, both in terms of geographic coverage in the ASALs and implementing partners. Building on—and subsuming—REGAL, the PREG initiative “brings together humanitarian and development partners to build resilience among vulnerable pastoralist communities in northern Kenya”.<sup>25</sup> PREG includes USAID programs and implementing partners operating in nine ASAL counties, with WFP in all nine and additional partners in Turkana, Isiolo, Marsabit, Wajir, and Garissa.

The PREG initiative is intended to:

- Sequence, layer, and integrate programming in order to avoid duplication and maximize impact;
- Leverage and partner strategically;
- Mutually reinforce activities that are different but still coordinated;
- Measure and evaluate impact by collecting data and measuring results consistently across all partners;
- Build sustainability through all stages of the project cycle and promote ownership by engaging with governments; and
- Share on the global stage a picture of USAID Feed the Future Synergy and Complementarity through partnerships.

<sup>25</sup> USAID. 2016. USAID Partnership for Resilience and Economic Growth Learning Event. Accessed at: <https://www.africaleadftf.org/wp-content/uploads/2016/09/PREG-Learning-Event-Slide-Deck-Aug-2016.pdf>.

### 1.3 OBJECTIVE OF THE STUDY

The initial research plan designed for the REGAL—and subsequently the PREG I—project evaluation was to conduct an impact evaluation that would allow for estimating the effect of differing levels of resilience programming investments (high- and low-intensity) on household resilience capacity. However, several issues emerged during the transition from REGAL to PREG that preempted an impact evaluation approach. As a result, data were analyzed using a pre-post analysis that traces changes in outcomes over time (i.e., between baseline and endline). Details of the methodological challenges and solutions are discussed in Section 2.

Because PREG subsumed REGAL, the PREG endline utilizes research questions designed for the REGAL IE:

1. What impact do investments to enhance resilience (REGAL) have on livelihood outcome indicators (HHS, as well as stunting, wasting, underweight, poverty prevalence and income)? What impact do they have on adaptive capacity?
2. What is the additive/multiplicative value of layering resilience (REGAL-IR) and economic growth (REGAL-AG) investments in relation to the indicators noted above?
3. What is the combined impact of REGAL-IR and REGAL-AG on depth of poverty (derived from expenditure data used to determine poverty prevalence) and other well-being outcomes?
4. What are the relationships between household and community resilience (derived from the qualitative data)?
5. Have interventions strengthened risk-reduction strategies pursued by men and women to cope with shocks (agro-climatic, health, economic, and socio-political)?

Overall, several of the original research questions developed for the REGAL impact evaluation that required comparison groups (Q1–4, and Q6) are only addressed to a limited degree in the current analysis (see Annex 3). Findings that address Q5 are integrally tied to the qualitative findings throughout the report and as such, Q5 is not addressed as a separate research question.

In addition to providing a pre-post analysis of change over time in PREG programming areas, the analysis in the main body of this report answers the following research question from the baseline:

*“How does resilience capacity affect household perceived ability to cope with future shocks?”*

## 2 METHODOLOGY

### 2.1 QUANTITATIVE SURVEY

The 2013 Feed the Future baseline survey served two purposes:

- As a population-based survey (PBS) designed to measure Feed the Future performance indicators for the nine ASAL counties of the ZOI in northern Kenya, and,
- As an impact evaluation baseline survey of PREG I to measure the changes in household resilience capacities and outcomes in areas with different levels of PREG I resilience programming intensity.

Similarly, the 2018 PREG I endline survey served two purposes:

- As the impact evaluation endline survey for PREG I, and
- As the impact evaluation baseline survey of the second five-year phase of PREG (PREG II).

Note that a mid-term survey was also conducted in 2015. Although this survey collected resilience information, it was primarily designed to collect point estimates of Feed the Future ZOI indicators and was not statistically powered to measure changes from the baseline survey. The results from the mid-term survey are not included in this endline study. For a full description of the midline survey sampling, please see Annex 4.

#### 2.1.1 Sample Design

As previously noted, the sample design changed from the baseline to the endline survey rounds. The baseline sample was divided into two geographic strata defined at the county level, based on existing and planned REGAL programming intensity. The LI stratum was identified as areas where only humanitarian assistance was provided through USAID resources supporting REGAL (and subsequently PREG), and covered Baringo, Mandera, Samburu, and Tana River counties. The HI stratum was defined as areas that received other resilience-enhancing investments (initially areas covered by REGAL, but later extended to all PREG programming) in Garissa, Isiolo, Marsabit, Wajir, and Turkana counties. The baseline samples drawn from the counties in these two strata were population-based, that is, all households within the counties constituted the sampling frame from which surveyed households were drawn. Note that for reasons of insecurity, one LI county (Mandera) and two HI counties (Garissa and Wajir) were excluded from the baseline survey sample.

At the time of the analysis of the midline survey, it became clear that the definition of the LI and HI strata by counties did not align with the reality of programming on the ground: because the sample of households was drawn from the total populations of the counties in accordance with the PBS design and the initial understanding of program intentions, many of the households that were selected from the HI counties did not directly participate in (i.e., benefit from) the resilience

programming supported by USAID. While the REGAL projects did include systems-level interventions to support value chains, the geographic reach of these indirect interventions was not known. Thus, it is impossible to determine whether respondents in HI (or LI) strata were indirect beneficiaries of these systems-level interventions.

The sampling strategy for the endline sample was modified in order to address these sampling and programming limitations. Rather than identifying the HI sampling frame on the basis of county only (as in the baseline), information from project records was used to identify much smaller geographic areas (sublocations) in which PREG projects had been carried out or were currently engaged in specific interventions at the time of the PREG I endline survey. HI sublocations were identified as those with reported interventions under REGAL (or a subsequent Feed the Future Livestock Market Systems project) or at least two other PREG activities (from the PREG intervention data set maintained by USAID).

The LI sampling frame was also changed from county level to sublocations within the LI counties where WFP-supported humanitarian assistance (and other non-resilience-building) activities had been carried out.<sup>26</sup> Thus, while the HI households selected for the endline survey were much more likely to have been directly exposed to resilience interventions, at least some households in the baseline sample from the HI treatment group were much less likely to have been direct beneficiaries, since the baseline sampling frame included sublocations where no PREG direct interventions occurred.

Because of this change in sampling strategy, the baseline and endline sample populations are no longer comparable: the sampling frame for the baseline covered the entirety of each county while the sampling frame at endline only covered part of each county (i.e., sublocations). Although the initial understanding of the intended high-intensity and low-intensity programming areas, defined at the level of counties, was applied for the baseline sample design, the actual area coverage of REGAL/PREG interventions did not conform to the original sampling design. The sampling frame for the endline survey was therefore modified to include only those sublocations where REGAL/PREG interventions were reported to have occurred.

In order to be able to make the most appropriate comparisons across time, the sample was restricted to sublocations that were covered in both the baseline and endline samples. This resulted in an 81 percent decrease in the size of the baseline sample and a 60 percent decrease in the size of the endline sample available for analysis (Table 3).

In some counties, the change in sample design resulted in a larger (e.g., Samburu, Tana River) or equal (e.g., Turkana) number of households because of a change in the sizes of the sampling frames relative to the baseline. Specifically, enumeration areas (EAs) were selected at both baseline and endline using Probability Proportional to Size (PPS). However, at baseline, the sampling frame comprised all EAs in a county, whereas the endline sampling frame only included sublocations (and their EAs) where PREG activities were being implemented. As the relative proportions of households in each county are different in the sampling frames of the two rounds,

<sup>26</sup> The USAID PREG team indicated that PREG II interventions are expected to continue in the same sublocations covered under the first phase of PREG.

the number of sampled households is different in each round. In particular, the proportion of households in the total sampling frame was higher at endline than baseline for both Samburu and Tana River.

Table 3: Sample size (disaggregated by county), by survey round

County	Baseline (Jan/Feb 2013)		Endline (Aug/Sept 2018)	
	Total sample (# HHs)	# HHs in sublocations that overlap with endline	Total sample (# HHs)	# HHs in sublocations that overlap with baseline
Baringo	234	10	58	29
Samburu	158	61	354	116
Tana River	180	34	382	84
Turkana	364	96	364	152
Isiolo	191	71	188	160
Marsabit	588	43	216	89
<b>Total</b>	<b>1,715</b>	<b>315</b>	<b>1,562</b>	<b>630</b>

Because of the limitations imposed by the change in sampling strategies for the LI and HI strata between baseline and endline, rigorous impact analysis techniques are not possible. Rather, a more basic pre-post analysis of the quantitative data from baseline to endline is conducted. More insights about the impacts of resilience programming on households will be drawn from the qualitative information. A comparable descriptive analysis of key indicators across the two rounds is provided in Annex 3, where the analyzed samples include only sublocations that were included in both the baseline and endline samples.

### 2.1.2 Resilience Information Collected

The 2013 PBS baseline survey<sup>27</sup> questionnaire included information to measure resilience outcomes (food security measures, expenditures and poverty, recovery from previous drought,<sup>28</sup> ability to cope with future shocks/stresses), as well as a brief module to measure selected dimensions of resilience capacities. It is important to note that at the time of the 2013 baseline survey, USAID had not yet developed a set of tools to fully measure all dimensions of resilience capacities. Since that time, USAID has developed a more comprehensive framework for resilience measurement and has identified a wider range of sources to measure resilience capacities and outcomes.<sup>29</sup> Additionally, the baseline did not collect information about the shocks/stresses households' experience, which is important for resilience analysis. Although USAID has since developed a shock/stresses module and the Shock Exposure Index (SEI), the lack of data on

<sup>27</sup> [https://pdf.usaid.gov/pdf\\_docs/PA00KPHV.pdf](https://pdf.usaid.gov/pdf_docs/PA00KPHV.pdf)

<sup>28</sup> Although there was no drought in the year prior to the baseline, respondents were asked about recovery from the last drought, which occurred in 2011.

<sup>29</sup> USAID/TOPS. 2017. Resilience Methodological Guide: Full Model. Prepared by TANGO. 25 October.

shocks/stresses at baseline means we do not have a clear idea of the types of shocks households faced over the period of the evaluation, which is a limitation for the current analysis.

Building resilience requires an integrated approach and a long-term commitment to improving three critical capacities: *absorptive capacity*, *adaptive capacity*, and *transformative capacity*.<sup>30</sup> Each capacity is an index constructed from relevant indicators, some of which are themselves indices. Below is a list of the three resilience capacity indices and their respective components. The 2018 endline survey collected information on some—but not all—components of each index, since comparable information was not collected at baseline (i.e., this resilience measurement framework had not been fully developed at the time of the baseline). Thus, only a subset of resilience capacity dimensions from the resilience measurement framework is included in the analysis presented in this report (included components are indicated in **bold**). Further, it should be noted that some of the indices are used to calculate multiple resilience capacity indices because they are relevant to both. For example, bridging and linking social capital are both used in the calculations of adaptive and transformative capacities.<sup>31</sup>

**Absorptive capacity index.** Absorptive capacity is the ability to minimize exposure to shocks and stresses through preventative measures and appropriate coping strategies to avoid permanent, negative impacts. The eight indicators are:

- Availability of informal safety nets
- **Bonding social capital** (social networks within a respondent's community)
- **Access to cash savings**<sup>32</sup>
- Access to remittances
- **Asset ownership**
- Shock preparedness and mitigation
- Availability of/access to insurance
- **Availability of/access to humanitarian assistance**

**Adaptive capacity index.** Adaptive capacity is the ability to make proactive and informed choices about alternative livelihood strategies based on an understanding of changing conditions. The ten indicators are:

- **Bridging social capital** (social networks outside a respondent's community)
- Linking social capital

<sup>30</sup> Béné et al. 2016.

<sup>31</sup> The use of resilience capacity dimensions in more than one index does not affect calculations of the individual resilience capacity indices, as they are independent.

<sup>32</sup> Savings was not calculated for the endline analysis. Although the data were collected, we determined that the results would be potentially biased because the wording of the question was different in the baseline (retrospective) and endline (prospective) surveys.



- Social network index
- **Education/training**
- **Livelihood diversification**
- Exposure to information
- Adoption of improved practices
- **Asset ownership**
- Availability of financial services
- **Aspirations/confidence to adapt index<sup>33</sup>**

**Transformative capacity index.** Transformative capacity involves the governance mechanisms, policies/regulations, infrastructure, community networks, and formal and informal social protection mechanisms that constitute the enabling environment for systemic change. The fifteen indicators are:

- Availability of/access to formal safety nets
- Availability of markets
- Availability of/access to communal natural resources
- Availability of/access to basic services
- Availability of/access to infrastructure
- Availability of/access to agricultural services
- Availability of/access to livestock services
- **Bridging social capital**
- Linking social capital
- Collective action
- Social cohesion
- Gender equitable decision-making index
- Participation in local decision-making
- Local government responsiveness
- Gender index

**Recovery from shock and coping strategies.** Subjective reports of households' ability to recover from shocks they experience are a key source of information on the strength of their resilience.

<sup>33</sup> Agency is one of several components of the aspirations/confidence to adapt index. Information on household agency is not included in this report due to measurement error (see Section 3.3.5).

Coping strategies are household responses to shocks and may include selling off livestock and other assets, reducing food consumption, taking loans from family members, or sending one or more household members elsewhere to work.

**Baseline resilience-related information.** As mentioned above, the 2013 PBS baseline survey had a much more abbreviated set of questions that captured only a portion of all the resilience components described above. They include the following questions that measure aspects of resilience capacity, coping strategies, and subjective resilience (measured as the perceived ability to cope with future shock/stress):

- Resilience capacity components
  - Livelihood diversification
  - Adult education
  - Savings
  - Asset ownership (a count of the number of types of assets a household currently owns; range: 0 to 34)
  - Social capital (reliance on financial or in-kind food support from relatives and non-relatives within (bonding) and outside (bridging) the respondents' communities during past and future shocks)
  - Agency (perception of whether one is responsible for his/her success or failure or if this is a matter of destiny)<sup>34</sup>
- Coping strategies
  - Change income or food sources
  - Add income or food sources
  - Sell large or small assets
  - Migration of one or more household members
- Perceived ability to cope with future shocks<sup>35</sup>

For more detail on how the resilience capacity indices and each dimension of resilience capacity are measured, refer to USAID Resilience and Resilience Capacities Measurement Options guidance.<sup>36</sup>

<sup>34</sup> Information on “household agency” is not reported here, due to measurement error (see Section 3.3.5).

<sup>35</sup> The baseline survey included a question about recovery from the latest drought but it did not collect information about the degree to which households were affected by the latest drought, which is optimal in order to accurately estimate recovery. However, perceived ability to recover from future shocks is a valid alternative, subjective measure of resilience.

<sup>36</sup> <https://www.fsnnetwork.org/resource/resilience-and-resilience-capacities-measurement-options>.

### 2.1.3 Field Procedures

Training of supervisors and master trainers for the baseline survey started on December 28, 2012, and was followed immediately on January 6, 2013, by a twelve-day training of enumerators. Supervisors and enumerators traveled to Nairobi for training. Training methods were in alignment with those developed for other Feed the Future FEEDBACK countries where a PBS data collection activity had taken place.<sup>37</sup> Training covered careful review of the quantitative questionnaire (including translation into and/or discussion in local languages), use of electronic tablets, use of weighing and measuring equipment, detailed instruction on interview methods, and human subjects' protection. Based on a thorough understanding of the questionnaires during training, enumerators translated questions in the field and recorded responses in the English version of the questionnaire. Supervisors received additional training on checking data quality, uploading data to the Westat server, and making and tracking enumerator assignments. All enumerators and supervisors reviewed and signed confidentiality forms.

For the endline survey, the local data collection subcontractor, Kimetrica, led a 15-day training (including supervisors and enumerators) in August 2018 in Nakuru, Kenya, which again included a careful review of the quantitative questionnaire, use of electronic tablets, use of weighing and measuring equipment, detailed instruction on interview methods, and human subjects protection. Teams consisted of five enumerators and a quality control interviewer. Staff from TANGO attended the training to provide technical assistance as needed. Each enumerator was provided with an Android-based tablet running CSPro programmed with the survey questionnaire including the necessary skip patterns and validation rules. In addition to English, tablets were programmed with questionnaires in Kiswahili, Somali, or Turkana and enumerators selected the relevant language for the household. Team supervisors received additional training on data quality procedures (e.g., daily review of each questionnaire in the field for completeness and accuracy), uploading data to the remote server, and enumerator assignments. During data collection and upon successful review, data were transmitted via cellular network to a remote secure server where it was aggregated and reviewed daily by Kimetrica staff. Kimetrica and TANGO staff developed field check tables to provide feedback to supervisors and enumerators during data collection so that inconsistencies could be corrected quickly.

### 2.1.4 Data Analysis

The quantitative data analysis was conducted with the statistical software STATA version 15 using descriptive analysis techniques.

#### **Descriptive Analysis of Trends**

In this report, the baseline and endline survey data are used to conduct descriptive analysis of change over time in indicators describing household coping strategies, poverty and food security status, and resilience capacities. Indicator values are reported as percentages and means.

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<sup>37</sup> These methods are documented in manuals, reports and PowerPoint presentations. Copies of the training manuals can be obtained from the Development Experience Clearinghouse or by contacting the Feed the Future FEEDBACK project.

- Percentages. For values provided in nominal scales (e.g., yes/no responses), percentages are computed using the weighted number of cases that provided a given response as the numerator, and the total weighted number of cases with valid data for the indicator as the denominator.
- Means. For continuous variables (e.g., number of livelihood activities), means are computed using the weighted sum of values as the numerator and the total weighted number of cases with valid data as the denominator.

Indicators are reported by time period (baseline and endline). Tests for statistically significant differences in the indicators between baseline and endline are reported for  $p < 0.05$  or less.

## Data Management and Security

Prior to release of data from the baseline and endline surveys, any direct or indirect identifiers that could be used to identify individuals, such as geographic information at lower administrative levels, was removed and/or modified to prevent disclosure of individual identities.

### 2.1.5 Limitations of the Quantitative Surveys

**Multiple purposes of the survey.** The PREG I baseline survey was initially designed as part of the population-based Feed the Future ZOI baseline survey for northern Kenya. The ZOI survey is designed as a performance monitoring survey to track changes in Feed the Future indicators at the level of the population within the ZOI, and is not designed to be able to make any assessment of the causes of these changes. The ZOI survey is population-based, drawn from the entire population within the ZOI. The impact evaluation, on the other hand, is intended to assess the extent to which resilience programming interventions contributed to enhancing the resilience of households, and therefore requires the inclusion of a counterfactual in the survey design. Because the survey was to serve as the Feed the Future ZOI baseline, the sample had to be representative at the level of the population as a whole. This requirement, along with the fact that the PREG I projects had not identified their precise geographic areas of intervention at the time of the baseline survey in 2013, placed limitations on the ability to delineate treatment and control strata within the total population-based sample of the ZOI.

The sampling strategy of defining control areas (areas that received only humanitarian assistance) and treatment areas (areas that received resilience programming in addition to humanitarian assistance) geographically by county proved to be an inaccurate way to identify the treatment and control populations. First, the PREG I project reached only parts of the populations in the counties designated as treatment, and since the sample was selected randomly from the entire populations of the counties, many sampled households in the designated treatment stratum did not, in fact, receive the ‘treatment’ of being exposed to resilience programming. Secondly, the survey design did not control for possible underlying differences in household characteristics between the control and treatment areas (e.g., level of education, wealth). Underlying contextual differences between implementation areas weakens the ability to attribute the observed changes between the treatment and control groups over time to the ‘treatment’ of resilience interventions

and as such, does not allow for a robust impact evaluation.<sup>38</sup> Instead, this report presents findings from a more general pre-post analysis that tracks changes over time. A limited difference-in-differences impact analysis is provided in Annex 3.

**Inability to attribute changes to PREG interventions.** The study does not allow for clear attribution of resilience programming to PREG I households as this was not a targeted beneficiary survey and many agencies were providing similar programming during the same time period as PREG I.

**Sample size.** Another limitation to the current study is related to the significantly reduced sample size available for the pre-post comparative analysis (see Annex 3 for the pre-post comparative analysis using a Difference in Differences (DID) approach on the significantly smaller overlapping sample that resulted from the change in sample design).

**Timing.** Fieldwork for the baseline and endline surveys took place at different times of year, which poses a potential bias in the data. In order to detect change over time in food insecurity and nutrition outcomes, ideally, data are collected at the same time each year and typically during the most vulnerable season (e.g., the lean season). Fieldwork for the baseline occurred in January/February 2013, when harvesting had begun (see Figure 3 in Annex 4). Fieldwork for the endline survey, which was contingent on timing for the PREG II baseline survey, ran from August to September of 2018, during the lean season. The inconsistent timing of the baseline and endline surveys is important to consider when interpreting the results, particularly as they relate to food security indicators, which are highly sensitive to seasonal variation.

**Resilience measurement development.** Since 2012, TANGO has been developing and refining its conceptual model and measures of resilience. The Feed the Future PBS baseline survey offered the opportunity to include questions to try to capture preliminary thoughts on resilience measurement and as such, reflects the nascent stage of the model's development. In the baseline survey, data on households' perceived level of severity of drought (i.e., the drought two years prior) were not collected. Without this information, we are unable to measure recovery from the drought two years prior and subsequently, were not able to include recovery as an outcome indicator. Rather, households' perceived ability to cope with future shocks/stresses is considered the primary subjective resilience outcome. Lack of information on shocks/stresses (or their severity) also makes it difficult to interpret data on coping strategies or ability to recover in the future.

**Participation in project interventions other than PREG.** A possible limitation of the PREG I analysis is the presence of interventions implemented by other projects. Ideally, the baseline survey would have included questions to collect information on household participation in any resilience programming activities generally, not just those implemented by PREG. Without this crucial information, it is not possible to estimate potential bias associated with other programming.

**Security-related restrictions on access to survey areas.** At the time of the baseline survey, Garissa, Mandera and Wajir counties were considered "no-go areas" by the Kenya National

<sup>38</sup> In PREG II it should be noted that the matched sample will overcome such potential differences.

Bureau of Statistics (KNBS) due to the presence of the known terrorist group al-Shabab, and were removed from the baseline sampling frame. Thus, the sample available for comparison across survey rounds is not fully representative of all PREG programming areas.

## 2.2 QUALITATIVE STUDY

Qualitative data collection for this report took place simultaneously with the endline quantitative field work (September 13–22, 2018). No qualitative data collection was conducted for the 2013 baseline. Thus, all discussion presented in this section refers to the PREG I endline.

The primary focus of the qualitative component was to collect perceptions of change in livelihoods and well-being at the community level. Data provided by community groups and key actors form the basis for identifying signals of PREG I contributions to this change process. In these interviews and focus group discussions (FGDs), explicit attention was placed on changes affecting women and youth. Insights garnered from the qualitative data provide context for observed quantitative patterns and, in some cases, illustrate the motivations and constraints that underlie different pathways of resilience strengthening. The analysis of qualitative data also suggests areas for further quantitative inquiry. Qualitative data is explanatory and is not meant to be generalizable to a broader population, thus it is not quantified. However, qualitative responses are triangulated during analysis across focus groups, key informants, and secondary data, and atypical responses are carefully reviewed to see if they add value to the understanding of participant responses.

Qualitative data-gathering took place in the six PREG I counties to meet the needs of the PREG II impact evaluation baseline survey (Marsabit, Isiolo, Garissa, Turkana, Wajir, Tana River). A team comprised of Kimetrica and TANGO staff trained local field researchers assigned to each county targeted in the study.

### 2.2.1 Survey Sample Design

Qualitative teams for the endline consisted of four-person teams, each consisting of two gender-balanced interview teams including one not taker and one facilitator. The teams were multidisciplinary and included both international consultants and local Kenyan consultants with knowledge of the PREG I implementation areas. Qualitative teams visited 16 villages that were selected to represent PREG I program distribution across counties, program intensity levels, and the variety of programming present in each sublocation. Security considerations also impacted the selection of community sites, with final site selection based on Kimetrica's security ratings, which were informed by quantitative fieldwork experience in the study areas. The list of communities visited in each county is presented in Table 4.

The study team gathered data from separate FGDs with men and women who are recognized as engaged and active members of their community. FGDs consisted of 6–8 participants. Recruitment criteria aimed to include a breadth of perspectives by engaging representatives from different clans and ethnic groups, and across various socio-economic groups within each community. Particular emphasis during the FGDs was given to individual and household participation in livestock markets; livelihoods; main shocks and stressors in the community; changes in household

and community responses to shocks and stresses; impacts of shocks on the community; and aspirations for the future. The topical outlines used to guide the discussions are presented in Annex 1.

The research team also conducted 54 interviews with a range of key informants with special knowledge of at least one aspect of the project's topics of interest. For PREG I, the key informants included community and clan leaders, school headmasters, private livestock traders, local merchants, implementing partner staff, representatives of local financial institutions, livestock insurance representatives, livestock association managers, NDMA staff, agriculture and livestock extension workers, health and nutrition staff, youth leaders, and slaughterhouse officials. The KIIs generated in-depth information on impact and the dynamics of local change, and functioned as a form of triangulation to improve the interpretation of the FGD results and quantitative trends. The major themes explored in the KIIs were the roles and responsibilities of the informant's position, major pathways of change in the region (related to the informant's area of expertise), the factors that drive such change, and the perception of future trends. The key informants were also asked about their understanding of and participation in PREG I interventions. The KII tools are provided in Annex 2.

*Table 4: Sites visited by qualitative team*

County	Sublocation	Setting Type
Tana River	Maroni	Rural
	Mikinduni	Urban
Garissa	Waberi	Urban
	Bour-Algi	Urban
	Iftin	Urban
	Nanighi	Rural
Turkana	Lokichar	Rural
	Lopur	Rural
	Nadapal Kakuma	Rural
	Lodwar Township	Urban
Wajir	El Nur	Rural
	Wagberi	Urban
Marsabit	Karare	Rural
	North Horr	Rural
Isiolo	Sericho	Rural
	Bula Pesa	Urban

## 2.2.2 Fieldwork

Key to the effectiveness of the qualitative component was an intensive training of the field researchers. TANGO and Kimetrica staff conducted a five-day training for qualitative researchers in Nakuru, Kenya. Participants were oriented to the overall purpose of the research, the central

research questions, a discussion of resilience concepts and the REGAL theory of change. Training also involved in-depth discussion of the topical outlines for the FGDs and KIIs, including the translation of these tools into local languages. A tool for recording and documenting the results of FGDs and KIIs was presented and analyzed at length. A practical, flexible guideline for successful fieldwork was prepared collectively, and a pilot field test was conducted outside of Nakuru. Qualitative data collection occurred over a three-day period in each site; thus, field teams were able to observe the local context and gather complementary observational information. Day One consisted of visiting the county seat and conducting KIIs, followed by separate FGDs with men and women and local-level KIIs on Day Two. Day Three allowed teams to discuss their findings and enter data into data collection matrices before moving to the next site, helping to ensure that qualitative information was reliable and representative of the project area from which it was collected. Qualitative researchers were equipped with voice recording devices and had the option to record interviews after first gaining permission from participants. Supervisors in each team coordinated logistics, FGD recruitment, and identified key informants.

### **2.2.3 Data Management and Security**

Each team entered data into analytical data matrices. Field supervision was heavily oriented toward recording rich, complete data in a consistent format. During the first round of site visits, the qualitative research team leaders provided feedback to interviewers on their qualitative data notes and worked directly with teams to refine and improve data collection and data entry. Research team leads reviewed each data matrix over a minimum of two rounds to ensure completeness before the dataset was finalized.

Data files were stored using Dropbox cloud storage and backed up on flash drives, which were submitted to Kimetrica once data collection ended. Prior to release of data, any direct or indirect identifiers that could be used to identify individuals, such as geographic information at lower administrative levels, was removed and/or modified to prevent disclosure of individual identities.

### **2.2.4 Data Analysis**

The study team entered the qualitative dataset, consisting of FGDs and KIIs, into a spreadsheet matrix organized by county, level of intensity of programming, FGD type (i.e., male or female), and designation as a rural or urban/peri-urban site. The analysts then carried out an initial content analysis to identify patterns of response by program intensity level and gender within and across counties. These patterns reflect local experiences with respect to changes in livelihood, livestock management, household and community adaptations to shocks and stresses, and reliance on external support. This report incorporates insights from the qualitative analysis in relevant sections.

### **2.2.5 Limitations of the Qualitative Component**

The team of researchers was highly competent, with good knowledge of the communities visited and many years of experience working in the survey areas. In the final assessment, the team was able to capture the processes and drivers of change necessary to inform the analysis of the



impacts of the first five years of the PREG initiative and to add richness to the interpretation of quantitative measures of resilience.

The major limitations of this component involve the restrictions of movement due to security risks. The teams only operated in locations that had been assessed and deemed a low security risk, potentially creating bias in the results. In other words, the qualitative findings are limited to reflecting the views and experiences of a subset of the project's population, at least some of whom reside in more secure communities. That said, the field teams did encounter incidences of insecurity in the study areas. TANGO staff, for reasons of security, could not visit all the communities selected in the sampling process, so the importance of the training, including team supervisor training, was critical. Where possible, regular contact through daily phone check-ins, text and email communication was used to support the progress of each team for quality assurance and to ensure adequate coverage and representativeness across KIIs. A second limitation is that the qualitative sample was drawn at the county and sublocation levels in order to meet the needs of the PREG II impact evaluation baseline survey and was not based on participation in PREG I activities at the site (i.e., community) level.

### 3 ANALYSIS OF FINDINGS

This section provides information from the PREG I baseline and endline surveys about participation in PREG interventions (from the endline survey only), livelihood activities, coping strategies, household resilience capacities, and well-being outcomes. The analysis provides insight into how livelihoods, coping strategies, resilience capacity, and well-being outcomes, including poverty, food security, and perceived ability to cope with future shocks/stresses, have changed over time in six of the nine PREG I counties (Isiolo, Marsabit, Turkana, Mandera, Samburu, and Tana River).<sup>39</sup>

#### 3.1 PARTICIPATION IN PREG INTERVENTIONS

The endline survey included information about the participation of respondents or their household members in specific resilience interventions supported by PREG programs. Table 5 describes the categories of trainings and participation in project-supported groups that were captured in the household questionnaire.

Table 5: PREG-supported trainings and groups

Trainings	Groups
Alternative livelihoods/income-generating activities	Savings and loan groups (VSLA, REAP groups, BOMA groups, etc.)
Livestock production practices/health/management	Livestock management associations (LMA, etc.)
Business/financial/accounting practices	Women groups (GIRL model, etc.)
Crop production practices	Mothers' groups
Crop or livestock marketing	Livestock producer groups
Rangeland management	Self-help groups (ADESO groups, etc.)
Nutrition training	Village committees (water management, NRM, conflict management health, school, etc.)
Savings/microfinance	Ward level committees (WARD adaptation planning committee, etc.)
WASH practices	
Conflict management	
Life skills (hygiene/family planning, etc.)	
Youth skills training (apprenticeship/internship, etc.)	

Table 6 provides information about households' reported participation in PREG development activities and trainings, and participation in project-supported groups in the endline survey. Overall participation in any activity (either trainings or groups) is quite low, and very similar across the HI and LI counties; overall participation is 15 percent in HI counties and 13 percent in LI counties. Participation in trainings is actually somewhat higher in the LI counties than the HI counties. More detailed information about participation by county is provided in Annex 5.

<sup>39</sup> Due to security issues at baseline, data were not collected in Garissa, Mandera and Wajir counties, hence the comparison is for six counties only.

Table 6: Percent of households reporting participation in project activities, HI and LI counties

	High Intensity	Low Intensity	Total Sample
Any participation (group and/or training)	15.1	13.1	14.1
Training participation	5.5	8.9*	7.2
Group participation	11.4	8.2	9.8
<i>N</i>	1,396	1,410	2,806

\* Statistically significant difference between LI and HI groups at  $p < 0.05$

### 3.2 LIVELIHOOD ACTIVITIES

Table 7 presents findings on the types of activities in which households engaged to generate sources of food and/or income over the course of the PREG I project. At endline, households remain largely dependent on livestock production and sales, with participation in farming, wage labor and self-employment decreasing significantly between baseline and endline.

Table 7: Household engagement in various livelihood activities, by survey round

	Baseline (Jan/Feb 2013)	Endline (Aug/Sept 2018)
Livelihood activities (% HH)		
Farming/crop production and sales	19.2	6.4*
Livestock production and sales	32.4	41.0
Wage labor	24.2	8.4*
Salaried work	27.3	19.7
Sale of wild/bush products (including charcoal)	13.6	26.6
Other self-employment/own business	23.2	7.4*
<i>N</i>	315	627

Traditionally, the primary livelihood system for most of northern Kenya has been based on livestock and rangeland management. Livestock herds moved between rainy-season and dry-season pastures, with entire families establishing temporary residence near the herds. In these male-dominated pastoral societies, the size of the herd carried great status, and animals played a fundamental role in marriage and in the maintenance of pastoral households. Competition for pasturelands among ethnic groups, and raiding of animals from other rangelands, was a common strategy for increasing herd size. Individual herder families were reluctant to sell their animals on a regular basis and did so only when family necessity dictated it or in times of crisis.

However, years of drought and banditry have decimated herds in the ASALs, resulting in major livelihood transformations. Many households are being “pushed out” of traditional livelihood systems, and entering into a semi-sedentary existence. Little (2016)<sup>40</sup> describes the varying processes that livelihoods are experiencing as “stepping up” where households are intensifying

<sup>40</sup> Little’s analysis draws on: Catley, A. and Y. Aklilu (2012). Moving up or moving out? Commercialization, growth and destitution in pastoralist areas. In *Pastoralism and development in Africa: Dynamic change at the margins*, ed. A. Catley, J. Lind, and I. Scoones, 85–97. Abingdon, UK: Routledge.

their livestock activities, “stepping out” where households are complementing their livestock activities with other forms of income generation (agriculture, small business, etc.), and “moving out” where households are abandoning livestock production altogether.

FGDs reveal that a combination of frequent drought since 2010, ever-more violent raiding, tension between land use for pasture and farming, modernization, and government policy has reduced the viability of traditional livestock activities and has ushered in an altered livelihood scenario. According to FGDs, the predominant pathways of change are characterized by decreasing engagement in livestock production, smaller herd sizes, herd compositions favoring more resistant breeds (e.g., goats, camels), reduced mobility and greater sedentarization, and shifting gender roles. Restocking programs initiated through the government and NGOs have helped some pastoral communities rebuild herds and re-engage in milk and meat processing activities (e.g., making dried camel steaks), particularly for women.

Findings from the quantitative survey show an upward trend of households selling wild/bush products. Data from FGDs in both urban and rural communities suggest that charcoal production, which is illegal, has become a primary source of income, particularly during the dry season and for the poorest households and communities. Despite the knowledge and risk of engaging in an illegal activity, multiple FGs expressed the perception that they “*had no other option*.” It is relevant to add that gathering firewood and making charcoal are onerous and taxing activities that require travel to remote areas with significant risks of criminal charges. It is neither a preferred livelihood strategy nor a specialized profession, but rather a type of “fallback” strategy that expands during difficult times. Further research into the specific types of wild products gathered for sale might help shed light on whether this can be considered a positive or negative shift in livelihood options.

The livelihood transformation over the last five years was evidenced across all communities and groups in the qualitative component of the survey, although it has not occurred in a uniform manner, and has different resilience outcomes for different communities. In large part, the specific context has influenced the nature of the transformation. For example, proximity to the massive Kakuma refugee camp in Turkana provides women with the opportunity to exchange washing services for food, while others sell *miraa* (khat), firewood, and charcoal in camp markets. Elsewhere in Turkana, oil was discovered some years ago, creating a “boom” economy with the inflow of outsiders searching for employment. The Tullow Oil company created opportunities for local men and women to service the growing population, but the company abandoned the region in 2017, resulting in a localized depression.

Similarly, urban and peri-urban communities across each of the six qualitative sample counties are experiencing significant livelihood changes toward modernization and away from more traditional pastoral livelihoods. In communities situated on the edge of urban areas or in close proximity to large markets and trading centers, FGD participants characterized most people now as “*business people, [who] used to only depend on livestock*.” At the same time, the quantitative findings indicate a reduction in self-employment. This apparent “discrepancy” between the quantitative and qualitative results may reflect—at least in part—the difference in perspective between respondents in the household survey and the considerably smaller qualitative sample size, as well

as individual perspectives of what constitutes a “business” person. Differences in understanding—or translating—respondent replies on the part of field teams can also contribute to perceived differences between qualitative and quantitative data.

While households still keep livestock, if possible, these are primarily one to two small livestock near the homestead and small herds (of 10–40 livestock) outside of town, where extended kinship networks, or hired herders in wealthier households manage livestock on nearby communal grazing lands. During periods of drought, households migrate further away to “greener pastures” or “hired rangeland.”

Some households keep poultry and “kitchen gardens” if water is available, and may have two to three hectares of rainfed farmland for cash-crop production of vegetable, fruit and maize production (particularly when closer to rivers/water sources) (e.g., Tana River). Vegetables, milk, textiles, handicrafts, and household goods are sold in small shops and traded at nearby markets, primarily by women. In some communities of Tana River, for example, riverbank ecology provides water resources for river-fed agricultural production, including cash-crop production of fruits and vegetables, as well as maize. Riverine resources also produce raw plant material for handicrafts.

As part of the changes perceived by FG participants, it was repeatedly stated that gender roles had shifted in ways that would suggest an improvement in women’s status and an expansion of their economic roles in the household economy. Women not only engage more fully in livestock activities, including owning and marketing livestock, they are also the key leaders in diversifying the household economy. In Tana River, for example, where agriculture has become increasingly important, women make decisions on crop choice, provide labor, and market their products in urban areas. In times of crisis, women gather fodder for animals and sell their milk to urban clients. In Turkana, women harvest palm fronds to make and sell handicraft items, such as hats. Women in refugee camps also work as laborers, and sell a variety of products (including miraa and fuelwood).

In some rural communities that retain high dependence on livestock and pastoral livelihoods (e.g., Marsabit), women have become less involved with livestock, shifting into care for children at the homestead, in “new appreciation for education and a shift away from pastoralism” characterized by the seasonal migration of family groups and herds. In most communities, both male and female FG participants described women as adapting to the “modern lifestyle”. In an eroded livestock-based livelihood, women have accepted more of the household income-generating burden, thus increasing their control, their mobility, and their status. In Isiolo, one women’s FG reflected on these shifting gender relations, noting that women have more of a voice, with greater engagement in the market and more opportunities for education.

Qualitative insights from FGDs and KIIs suggest a process of adaptation to drought and other shocks/stresses, with livelihood diversification considered a key factor. Most households and communities are seeking alternatives to the livestock economy. For some households, this process appears to be driven by exposure to information or education, or linkages with external actors. For most, however, the qualitative data indicate a low level of resilience capacity, despite a general desire to diversify livelihoods and seek greater access to education, training, and financial

services. The poorest households may be moving out, abandoning herding altogether and switching to low-paying labor markets, such as working in refugee camps or selling charcoal. According to FGDs and KIs, some relatively better-off households—for example, those with more animals and access to markets and infrastructure—are complementing their livestock activity with small-scale farming oriented toward the market, even as farming has decreased generally between baseline and endline across the PREG I project areas. While communities often described experience with or intentions to diversify into farming, in some areas this effort at both the household and community levels has been compromised by insufficient access to water (e.g., Marsabit, Isiolo), and in other areas to pests, flooding or conflict over crop land (e.g., Turkana, Garissa). Others are diversifying into small business enterprise, according to some FGD participants, including some handicraft production. Some herders, considered wealthier, are choosing to sell most of their herd to invest in an urban-based dwelling and open a shop.

Although insights from the qualitative data appear to contradict quantitative findings presented in Table 7, it should be noted that the qualitative insights are from a small sample size of people selected to participate in FGDs or KIs from a small sample of sublocations across the PREG I implementation area and are not necessarily generally representative of the average PREG I beneficiary population, which is represented by the quantitative results. However, even as the quantitative data show certain trends or directional changes over time, insights from FGDs and KIs can still provide relevant—though more localized—insights regarding household responses and behaviors, at least for some households.

### 3.2.1 Livelihood Diversification and Education

FGD participants tended to closely link the ability of a household to diversify their livelihood strategies with education, training and access to financial capital. FGD participants generally perceived a great deal of household interest in education, increased enrollment, and a widespread desire for greater educational and training opportunities for youth in general and girls in particular. In one Garissa community, for example, women FGD participants emphasized the importance of education, adding that they “*don’t want [our] girls to have the same fate [we] had.*” Education is viewed as the pathway to livelihood diversification and adaptation to “modern life,” moving away from pastoralism and toward education. Diversification into farming, small business, and the establishment of savings groups is also often attributed to skills training. However, migration or dislocation of the household as a response to shock disrupts educational enrollment, as well as the more persistent lack of access to schools and teachers in the most rural, isolated, or insecure areas.

According to qualitative findings, young people and their families rely more on education as a pathway to a non-herding career than in the past. Even the most traditionally pastoral communities appear to favor a “modern” pathway of education and employment. Across FGDs, participants expressed a vision for the future that focused on access to primary and high school, even higher education for some.

The aspiration to educate children for sustained employment is, however, tempered by the local economic reality. Especially in urban sublocations, FGD participants lamented a rise in social

dysfunction. Many high school graduates do not find suitable employment and people complain of high rates of petty crime, particularly theft and prostitution. In one urban sublocation in Isiolo, female focus group participants talked of the social problem of “single mothers” (understood as sex workers who become pregnant) and increased rates of HIV infection. Thus, qualitative discussions suggest that some of those who benefitted from the pathway of education may have lacked opportunities to benefit from some of the advantages it affords.

### 3.3 COPING STRATEGIES

Coping strategies are actions households adopt to reduce the negative impact of shocks and stressors. The number of households that relied on at least one coping strategy in the face of shocks or stressors decreased between baseline and endline, but was not statistically significant (Table 8). At endline, fewer households than at baseline changed their source of income or food, or sold assets, both large and small. In contrast, more households at endline than baseline reported that one or more household member migrated as a way of coping with a shock or stressor. It should be noted that this is a partial list of coping strategies (thus percentages may not sum to 100 percent), multiple responses are possible (percentages may sum to more than 100 percent), and some households “did nothing.”

Table 8: Household coping strategies and asset recovery, by survey round

	Baseline (Jan/Feb 2013)	Endline (Aug/Sept 2018)
Households who adopted at least one coping strategy (%)	48.4	42.0
<i>N</i>	314	627
Types of adaptations (% HH)*		
Changed income or food sources	36.1	1.4*
Added income or food sources	12.0	6.8
Migration of one or more household members	5.4	19.3*
Sold large asset	48.5	29.9*
Able to recoup some or all large asset(s) sold	0.3	0.3
Sold small asset	55.7	0.3*
Able to recoup some or all small asset(s) sold	0.2	0.0
<i>HHs who adopted at least one coping strategy</i>	152	269

<sup>i</sup> Partial list of all possible coping strategies; full list includes “did nothing.” The sum of strategies may exceed 100% because this was a multiple-response question and households could identify more than one strategy.

\* Statistically significant difference at  $p < 0.05$

As noted above, sales of large assets dropped significantly at endline, and there was no change between baseline and endline in households’ ability to recoup those assets once sold: at both baseline and endline, very few households reported they were able to recoup their assets—large or small—after selling them. The ability of a household to recoup an asset (e.g., livestock) after selling it as a way to deal with a shock or stressor implies some degree of “recovery” but is not a sufficiently robust measure of recovery for resilience analysis and is not used as such here.

More dramatically, the practice of selling small household items plunged to nearly zero at endline. This may be a result of households no longer having assets to sell, having divested of assets in response to shocks over time or having lost assets due to shocks. In some qualitative FGDs, participants described severe loss of livestock, in particular, as a result of drought, as well as shelter and productive assets (e.g., water pumps, farm implements) due to flooding (Marsabit, Wajir, Tana River, Garissa).

The relationship between asset sales and the ability to recoup those assets is quite complex in light of the ongoing transformations occurring in northern Kenya. The qualitative research found that some communities (e.g., Wajir, Garissa, Isiolo) indicated they have taken up destocking as a strategy to acquire cash for savings or purchase food and fodder and “save remaining livestock” during a drought. While not widespread, FGD participants described this strategy as distinct from and more effective than government destocking programs (e.g., Isiolo) or distress sales. More commonly, however, the divestiture of a major asset, such as part of the livestock herd, represents a coping response to a shock, such as drought. In several communities across all counties, FGDs reported selling livestock to meet “urgent” needs—specifically school fees and medical expenses, which in turn has led to decreased herd sizes. Some indicated that selling livestock to meet basic needs is a more recent practice, most common among those with smaller herd sizes (i.e., the less well-off).

The qualitative findings also suggest that, in some cases, livestock asset sales may represent the process of transforming to another livelihood configuration: livestock sales could have other—or multiple—drivers beyond shocks. In contrast to the findings presented in Table 7 on livelihood practices at baseline and endline, several FGDs note that some households with livestock sell animals, sometimes the entire herd, to invest in a less risky activity such as a small business. Again, differences between quantitative results and insights from qualitative FGDs and KIs may simply reflect dramatically different samples—one a very small subset of the other; qualitative findings are considerably more local than quantitative averages across the entire project sample.

Those households in a more precarious economic situation may similarly divest themselves of productive assets not only as a response to a shock, but also as part of a wider strategy of diversification. The FGDs also revealed a strategy of more advantaged households in which part or all of the herd is sold at time of crisis, and the resources are set aside to purchase of a new herd once the stressors have diminished.

Multiple FGDs described the widespread and devastating loss of herds in recent droughts (i.e., 2017, 2019), as well as reductions in herd size due to conflict, banditry and disease. Among those with the means to retain herd sizes, low prices (e.g., Garissa) are a disincentive to sell livestock.



## 3.4 RESILIENCE CAPACITIES

This section provides information on a subset of household resilience capacities. Households with strong resilience capacity often diversify their livelihoods and adapt their farming and pastoral systems to future uncertainty or variable conditions, such as climate change.<sup>41</sup>

### 3.4.1 Assets and Savings

The average number of assets owned decreased from 5.9 to 4.5 over the survey rounds, though the change is not statistically significant. From this finding, we can infer that the decrease in sales of large and small assets as a coping strategy (Sec. 3.3, Table 8) was not necessarily due to lack of assets to sell.

### 3.4.2 Livelihood Diversity

Livelihood diversification provides flexibility, resources, and skills, all of which contribute to household capacity to deal with shocks/stressors. Between the baseline and endline, households reported engaging in slightly fewer different livelihood activities, dropping from 1.5 to 1.2 ( $p < 0.05$ ). Engaging in fewer livelihood strategies may limit households' ability to adapt to changing conditions—even if they were highly motivated or confident to do so.

### 3.4.3 Reliance on Relief

Households were asked if they relied on relief or assistance (e.g., cash, food aid, cash/food for work, asset transfer, etc.) as a source of income or food. Reliance on relief decreased from 14.8 percent to 6.5 percent, though the change is not statistically significant. Qualitative findings suggest that most communities received some form of relief (e.g., food aid, cash, fodder, seedlings, vaccines, security, malaria nets) during times of crisis over the previous five years, if not during the last 12 months. In some cases, FGDs credited school feeding with minimizing “starvation,” and government and NGO disaster response was described as a “great help” in the face of drought. In Marsabit, for example, FGDs credited relief in response to drought and floods, layered with development activities (e.g., investments in water infrastructure and education, provision of health care and veterinary services, savings groups, and livelihood diversification such as farming—as critical to their overall capacity to cope with shocks and stresses. Other communities in the PREG I area, however, reported that while they perceive a need for relief, there has been little to no aid of any kind available and where provided, that it was often too slow, too limited in duration, and insufficient relative to need. Food aid is often described as helpful but insufficient, particularly for the poorest households who depend almost entirely on outside assistance.

### 3.4.4 Social Capital

Social capital refers to the bonds between community members and across communities. It involves principles and norms such as trust, reciprocity, and cooperation, and is often drawn on in

<sup>41</sup> Béné et al. 2012.

the disaster context, when survivors work closely to help each other to cope and recover.<sup>42</sup> In the baseline survey, respondents were asked if their household relied on others for food support (financial or in-kind) during the last drought (which occurred in the year prior to the baseline), and if so, who were the sources of support. We refer to this as “use of social capital”. A second indicator of social capital includes a measure of whether respondents indicate they think they *could* rely on others in the future during times of stress; it differs from the first indicator in that it measures the respondent’s perceived potential for using social capital. For both questions, a positive response prompts them to indicate the sources of support, including:

- Relatives in my village/community;
- Relatives outside my village/community;
- Non-relatives in my village/community;
- Non-relatives outside my village/community; and
- Non-relatives outside my tribe/ethnic group.

Table 9 (next page) shows the percentage of households that report relying on others in the past (use of social capital) and the percentage that believe they can rely on others in the future (perceived availability of social capital), and of those households responding positively to each question, the types of social networks they rely on. The table also reports the average number of sources of support.

About thirty percent of households at baseline and forty percent of households at endline report they had been able to rely on someone else for financial or in-kind support when needed. While relying on relatives within a household’s own village or community was the most commonly used form of support at both the baseline and endline, there was a significant shift in households relying on those outside one’s tribe or ethnic group. Correspondingly, the number of sources of social support that households relied on increased by 0.5.

The statistically significant, and substantial, increase in the percentage of households reporting they sought support from non-relatives outside of their tribe or ethnic group, from 6.7 percent at baseline to 31.2 percent at endline, may reflect people needing to “cast their nets” wider than their immediate family. This explanation is consistent with other studies showing that households’ ability to share food, livestock, etc. during times of stress can diminish over time if the shock/stress (e.g., drought) is prolonged;<sup>43</sup> available resources simply run low, or run out completely. Numerous FGDs (e.g., Isiolo, Marsabit, and Turkana) reported that households were, in general, not less reliant on relief efforts and external actors—rather, for many, it was not enough and households sought additional support through their social networks to cover gaps. It is also possible that households have more sources of support from which to draw at the endline than

<sup>42</sup> Frankenberger, T., Mueller, M., Spangler, T., and Alexander S. (2013). Community Resilience: Conceptual Framework and Measurement Feed the Future Learning Agenda. Rockville, MD: Westat. <https://www.fsnnetwork.org/community-resilience-conceptual-framework-and-measurement-feed-future-learning-agenda>.

<sup>43</sup> Frankenberger T and L Smith. 2015. Ethiopia Pastoralist Areas Resilience Improvement and Market Expansion (PRIME) Project Impact Evaluation: Report of the Interim Monitoring Survey 2014–2015. November 2015.

they did at the baseline, for example through engagement in markets, livelihoods activities, or collective action, all of which can expand households' social networks and build social cohesion.

There was a statistically significant increase between baseline and endline in people's perceptions of being able to rely on support from others if they needed it in the future (perceived availability of social capital), in almost all types of sources of social support. Of those who reported they could rely on others to help them deal with a future shock or stress, "relatives in my village/community" was again the most commonly reported source of perceived future support, at both baseline and endline. Moreover, the number of different types of social support households perceived they could rely on in the future increased from 1.7 to 2.8, a statistically significant increase. This suggests that people are fairly "optimistic" about where they think they can seek support when they need it; it is possible that this is due to the expanded social networks resulting from participation in PREG activities.

Table 9: Use and availability of social capital, by survey round

	Baseline (Jan/Feb 2013)	Endline (Aug/Sept 2018)
% of households that relied on others (use of social capital)	31.5	40.3
<i>N</i>	315	627
Types of social networks (%)		
Relatives in my village/community	69.6	67.1
Relatives outside my village/community	39.5	51.1
Non-relative in my village/community	30.2	42.1
Non-relatives outside my village/community	19.7	21.1
Non-relatives outside of my tribe or ethnic group	6.7	34.2*
Average # of sources on which household relied (max range: 0–5)	1.7	2.2*
<i>HHs that relied on others</i>	130	280
% of households that can rely on others in future shocks (availability of social capital)	57.0	88.5*
<i>N</i>	315	625
Types of social networks (%)		
Relatives in my village/community	77.1	82.3
Relatives outside my village/community	45.0	70.9*
Non-relative in my village/community	29.2	46.6*
Non-relatives outside my village/community	12.9	46.0*
Non-relatives outside of my tribe or ethnic group	6.3	35.6*
Average # sources on which household can rely in future (max range: 0–5)	1.7	2.8*
<i>HHs that can rely on others in future shocks</i>	197	558

\* Statistically significant difference at  $p < 0.05$

The qualitative data indicate that the strength and nature of social capital and collective action vary across communities over time and in relation to other sources of external support. Multiple communities, both urban and rural, reported numerous examples of collective action and coping and adaptation strategies that they rely on and that are, in many cases, embedded in intra-community traditions of resource sharing within family and community groups. *“The community depends on each other as families, close clan members and good neighbors”* (Marsabit). For example, communities support each other by providing food, clothing, fodder, water sharing, loans of livestock for milk, and housing materials. In some areas, community leaders mobilize food sharing and fundraising efforts, and organize wage labor activities for the poorest families. Savings groups, namely VSLAs, were cited as a common way for “savings sharing.”

In some cases, however, social networks have deteriorated over time. The qualitative findings suggest that for some communities, critical bonding social capital (e.g., relatives within the respondents’ community) that represents a first line of defense in times of crisis may have become overtaxed due to recurrent climatic shocks, conflict over increasingly scarce natural resources, and the loss of productive household assets. This may underlie—at least to some degree—the quantitative findings presented in Table 7, which indicate that: i) more households sought help from non-relatives outside of their tribe or ethnic group, and ii) more households think they will need to use support sources beyond their immediate relatives, both within and outside of their own community, to help them deal with shocks/stresses in the future. As stated in one Turkana FGD:

*“When we had livestock, we used to help each other; but now since we are in the same economic level, this is no longer possible.”*

Inter-ethnic conflict and insecurity, theft, and assault also contribute to the breakdown of social bonds. Participants in some communities reported increasing levels of “mistrust,” “crime,” “prostitution” and “single mothers” as warning signs of social dysfunction. Multiple FGDs, both rural and urban, reported that distrust within the community is heightened when natural resources are stressed.

In some areas, collective action centers on community initiatives to manage natural resources such as water catchment points and enclosures, manage communal pasture to buffer against drought, as protect forests. However, only three of 16 communities (Turkana, Garissa, and Wajir) stated that they conduct annual disaster risk reduction meetings and develop planning and response plans. According to FGDs, a number of areas engage in “collective problem solving” and maintain clearly delineated mechanisms to address intra-community and intertribal conflict. Community-based engagement with government officials and NGOs to advocate for services or a role in local development planning was reported in some FGDs (e.g., Tana River, Isiolo). In some areas (e.g., urban areas), local peace committees and security teams, comprised primarily of local youth and community leaders, address issues of insecurity and assault through patrols and dispute mediation.

FGDs also indicate that while people continue to borrow from family members and others within their communities—namely from better-off households and shop-owners on credit—these sources of support have been drawn down, as one FGD in Tana River summarized:

*“There are limits on sharing resources because every household feels the stress, they do receive food aid during the crisis .... In the past, it was easy to solicit help from neighbors, but not so today, and loans only make the situation worse. People do not share as they once did, except in time of death.”*

In Turkana, for example, FGDs noted that in some cases better-off households affected by recent shocks were less able to fulfill their traditional role of providing loans, food and other support for community members during times of need. In some sites, FGDs reported growing mistrust within the community around borrowing and debt, with shopkeepers less willing or able to allow people to purchase food and basic goods on credit during times of stress, described as common practice in the past. In a number of study sites, opportunities to borrow within the community during periods of droughts or floods have been constrained by stress on lenders (both cash and in-kind commodities and foodstuffs).

The extent to which these proximal sources of social capital have waned over time may have triggered the need to access sources of social support outside of one’s family, community, or ethnic group, as indicated in the quantitative findings. However, there is also some indication that investments in market systems may have contributed to broader social networks, at least for some households. Although there is no clear evidence of such an expansion of social networks in the community-level FGD data, some KIIs and market visits (Isiolo, Marsabit) suggest that new markets and market linkages provide an opportunity for increased interaction and networking among previously more disparate groups. Though plausible, current data (quantitative and qualitative) do not capture whether this translates into people feeling comfortable enough, or willing, to rely on what may be newly established networks for helping them deal with a future shock.

### 3.4.5 Agency

Information on household agency was measured at baseline and endline. Agency is measured by views related to the perception that one has little control over one’s future. It was organically measured because perceiving that one has little control over one’s future has been highly correlated with negative outcomes in the face of recurrent droughts in other studies in the Horn of Africa.<sup>44</sup> Results are not included in this report due to measurement error potentially related to differences in translation of the survey questions in the baseline and endline.

<sup>44</sup> Frankenberger et al. 2013.

### 3.5 HOUSEHOLD WELL-BEING OUTCOMES

Table 10 presents the results for four measures of well-being: expenditures, poverty level, moderate/severe hunger, and perceived ability to cope with future shocks. At the end of the first five-year PREG initiative, households had less money to spend, their hunger status (HHS) had significantly increased, and fewer households indicated being able to cope without difficulty in facing future shocks. More households were in poverty at endline, but this was not a statistically significant change.

Table 10: Household well-being outcomes, by survey round

	Baseline (Jan/Feb 2013)	Endline (Aug/Sept 2018)
Expenditures (USD mean)	2.07	1.28*
	<i>N</i> 315	627
Poverty (% HH below 1.25USD)	59.9	74.9
	<i>N</i> 315	627
Moderate or severe hunger (HHS, % HH) <sup>45</sup>	43.2	70.3*
	<i>N</i> 277	615
Perceived ability to cope with future shocks (% HH)		
Unable to cope	30.4	46.5
Able to cope, with adjustments	36.9	43.1
Able to cope, without adjustments	32.7	10.5*
	<i>N</i> 315	614

\* Statistically significant difference at  $p < 0.05$

The qualitative data show that the frequent, persistent and compounding nature of the shock context has, in many cases, undermined efforts of households and communities to effectively recover: shocks and stresses are a constant feature of their lives, rather than a single-event episode. While there appears to be a great deal of variability in the experience of shocks across households, a number of communities reported experiencing intense flooding, drought and livestock disease during 2017, among other shocks, compounded by the erosion of assets and resources (e.g., homes, livestock, productive technologies, grazing land) that have collectively reduced their capacity to recover. Across the qualitative sample, for example, livestock disease was widely reported and indicated as a driver, along with climatic shocks, of reduced herd size or a shift out of pastoralism. Most communities indicated lack of veterinary services as a major challenge, with services described as “inconsistent” and typically provided only in response to disease outbreaks (e.g., rift valley fever, foot and mouth disease)—a response often described as inadequate or too late to prevent livestock death or support timely recovery.

<sup>45</sup> The Household Hunger Scale (HHS) is a perception-based food deprivation scale that measures the prevalence of households with moderate or severe hunger. Answers to three of nine frequency-of-occurrence questions pertaining to the most severe forms of food insecurity are used to construct a score on a scale of 0 to 6. The prevalence of hunger is then calculated as the percentage of households whose scale value is greater than or equal to two, which represents “moderate to severe hunger.”

### 3.5.1 Relationship between Household Characteristics and Subjective Resilience

Table 11 shows the values of various resilience capacity components for households with different perceived abilities for coping with future shocks (i.e., subjective resilience) at baseline and endline. For each component, levels of perceived ability to cope with future shocks are categorized according to participants’ responses as “unable,” “able, with adjustment” or “able, without adjustment.” Tests of statistical significance were conducted relative to the “unable” category for each survey round, i.e., comparing i) “unable” and “able, with adjustment” values at baseline and ii) “unable” and “able, with adjustment,” values at baseline; the same tests were performed for endline values. The asterisks represent significant results for those comparisons. In addition, the baseline and endline values for each level of ability were tested for statistical significance, e.g., “unable” values at baseline are compared to “unable” values at endline. Significant differences for the latter comparison are indicated with a superscript “a.”

The trends in these data align with our hypothesis that higher levels of resilience capacity correspond to greater subjective resilience. At baseline, households with greater subjective resilience (able to cope without making adjustments) had more types of assets and higher human capital (as indicated by the percentage of households with at least one adult with at least a primary education) and tended not to rely on emergency relief (e.g., food aid, cash, fodder, seedlings, vaccines, malaria nets, etc., but were less likely to report they could ask others for support in times of need compared to households who reported being unable to cope with future shocks. It is notable that considerably fewer households at endline reported being able to cope with shocks/stressors without making any adjustments, compared to baseline. The results suggest that by endline, households generally perceived themselves as being less able to deal with future shocks/stressors but also felt more strongly that they could rely on others for help. As previously noted, the qualitative data indicate that even those households indicating they are able to cope with future shocks without adjustments were affected by recent shocks and incurred debt that interfered with their traditional role of providing loans, food and other support within their communities during times of need.

Table 11: Resilience capacity components for three categories of subjective resilience, by survey round

Resilience capacity components	Ability to cope with future shocks Baseline			Ability to cope with future shocks Endline		
	Unable	Able, with adjustment	Able, without adjustment	Unable	Able, with adjustment	Able, without adjustment
Perceived ability to cope with future shocks (% HH)	30.4	36.9	32.7	46.5	43.1	10.5 <sup>a</sup>
Able to rely on others in future (% HH)	65.6	67.1	37.3*	83.5	92.6**	96.4***
Livelihood diversity (avg. # livelihoods)	1.4	1.8**	1.3	1.1	1.2	1.2

Resilience capacity components	Ability to cope with future shocks Baseline			Ability to cope with future shocks Endline		
	Unable	Able, with adjustment	Able, without adjustment	Unable	Able, with adjustment	Able, without adjustment
Asset index (avg. # asset types)	3.4	5.8**	8.4***	3.2	5.4***	6.3***
Adult education (% HH with at least one adult with at least primary education)	37.1	63.7*	73.1***	41.0	67.6*	77.7**
Relied on relief as a source of income or food in the past 12 months (% HH)	21.3	16.6	6.7***	9.1	3.7	6.4
<i>N</i>	123	118	74	234	307	71

<sup>a</sup> Statistically significant difference ( $p < 0.05$ ) between baseline and endline.

\*, \*\*, and \*\*\* represent statistically significant differences at  $p < 0.05$ ,  $p < 0.01$ , and  $p < 0.001$ , respectively, compared to the “unable” reference category within each survey round.

Given that promotion of livelihood diversity is a prominent element of PREG, in Table 12 we present a more in-depth look into how subjective resilience is associated with the types of livelihoods in which households are engaged. As in Table 11, levels of perceived ability to cope with future shocks are categorized according to participants’ responses as “unable,” “able, with adjustment” or “able, without adjustment.” Tests of statistical significance were conducted relative to the “unable” category for each survey round, i.e., comparing i) “unable” and “able, with adjustment” values at baseline and ii) “unable” and “able, with adjustment,” values at baseline; the same tests were performed for endline values. The asterisks represent significant results for those comparisons. In addition, the baseline and endline values for each level of ability were tested for statistical significance, e.g., “unable” values at baseline are compared to “unable” values at endline. Significant differences for the latter comparison are indicated with a superscript “a.”

At both baseline and endline, households that perceive themselves as unable to cope with future shocks were predominantly engaged in livestock production/sales and sales of bush products. This perception was also relatively common among wage laborers at baseline.

Comparing households that are unable to cope with those that are able to cope with or without adjustments, the former tend to rely on selling bush products, a high-risk labor-intensive livelihood activity. This is true at both baseline and endline. Conversely, a much smaller proportion of households that are unable to cope are engaged in salaried work, self-employment, or crop production and sales.<sup>46</sup>

<sup>46</sup> At endline, few households are engaged in crop production and sales, irrespective of their perceived ability to cope with future shocks.



Table 12: Household engagement in livelihoods activities by subjective resilience category, by survey round (% households)

Livelihood activity	Ability to cope with future shocks Baseline			Ability to cope with future shocks Endline		
	Unable	Able, with adjustment	Able, without adjustment	Unable	Able, with adjustment	Able, without adjustment
Livestock production & sales	39.5	36.5	21.7*	33.7	48.4	36.7
Crop production & sales	10.8	33.3*	11.6	4.0	8.0	9.6
Wage labor	25.6	34.8	11.3*	9.3	8.8	0.4*
Self-employment	13.4	33.0*	21.4	2.6	12.0*	8.1
Salary work	7.7	20.9*	51.8*	8.8	23.2**	56.1*
Sales of bush products	26.8	11.4*	4.0*	48.1	9.8*	4.0*
<i>N</i>	123	117	74	234	309	71

Note: Significance tests were performed on baseline and endline values but there were no significant differences.

\*, \*\*, and \*\*\* represent statistically significant differences at  $p < 0.05$ ,  $p < 0.01$ , and  $p < 0.001$ , respectively, compared to the “unable” reference category within each survey round.

### 3.6 CHILD NUTRITION STATUS

This section reviews three anthropometric measures of undernutrition in children under age five in the study area: stunting, wasting), and underweight. Child undernourishment can have serious short-term and long-term consequences, including higher mortality risk.

**Stunting** is an indicator of linear growth retardation, most often due to a prolonged inadequate diet and poor health. Reducing the prevalence of stunting among children, particularly age 0–23 months, is important because linear growth deficits accrued early in life are associated with cognitive impairments, poor educational performance, and decreased work productivity as adults. Stunting is a height-for-age measurement that reflects chronic undernutrition. **Wasting** is an indicator of acute malnutrition; children who are wasted (i.e., low weight-for-height measurement) are too thin for their height and have a much greater risk of dying than children who are not wasted. **Underweight** is a weight-for-age measurement and reflects acute and/or chronic undernutrition.

Table 13 shows no statistically significant differences between baseline and endline for any of the anthropometric indicators.

Table 13: Prevalence of stunting, underweight and wasting across survey rounds for children under 5 years of age

	Baseline (Jan/Feb 2013)	Endline (Aug/Sept 2018)
<b>Stunting</b>		
Moderate-to-severe stunting, <-2SD (%)	28.8	22.9
Severe stunting, <-3SD (%)	12.0	6.5
<b>Underweight</b>		
Moderate-to-severe underweight, <-2SD (%)	20.5	18.7
Severe underweight, <-3SD (%)	4.5	2.0
<b>Wasting</b>		
Moderate-to-severe wasting, <-2SD (%)	12.3	11.3
Severe wasting, <-3SD (%)	4.3	1.3
<i>HHs with children under 5</i>	212	262

\* Statistically significant difference at  $p < 0.05$

## 4 OBSERVATIONS AND CONCLUSIONS

This report presents findings from the PREG I northern Kenya baseline and endline surveys. The pre-post analysis compares endline values to those estimated in the sample of households in the six county sublocations surveyed at baseline. The report provides estimates of household resilience measures and uses qualitative data for context and to help explain the quantitative findings. It also provides results from analysis using a DID approach to compare differences between survey rounds for LI households to differences between survey rounds for HI households (see Annex 3 for more details).

### 4.1 KEY FINDINGS RELATED TO RESILIENCE ANALYSIS

#### 4.1.1 Livelihood Activities

Livestock production and sales was the most common livelihood activity of all households in both surveys. At endline, fewer households cited farming, wage labor and self-employment as a livelihood activity. Qualitative focus groups indicated widespread desire to diversify into small-scale farming; for many, however, recent investments in small-scale agriculture have been undermined by droughts and floods. Of note was a slight but significant increase in reliance on wild harvested products at endline and qualitative findings also indicate some reliance on wild foods. Harvesting wood for charcoal production has become a primary activity across study sites, despite its illegality and advocacy against charcoal production.

The quantitative data suggest a shift in livelihood strategies among households in the programming areas. In particular, households are “stepping out” and “moving out” of livestock activities; either complementing them with additional sources of income or abandoning livestock as a source of income altogether. This finding is supported by qualitative data, which suggest that frequent drought, violent raiding, tension between land use for pasture and farming, modernization, and government policy have combined to reduce the viability of the traditional pastoral livelihood and to usher in an altered livelihood scenario.

Findings from the DID analysis showed that the decrease from baseline to endline in households engaging in wage labor was significantly greater for HI households than for LI households (Table 14; Annex 3). Otherwise, differences between survey rounds for HI households were not significantly different than those for LI households for any other livelihood activity.

#### 4.1.2 Coping Strategies

A common household strategy for dealing with shocks/stresses involves selling assets. Sales of large assets are considered “distress sales” and exclude routine livestock sales. Households relied less on selling large assets at endline, although almost 30 percent of households continued to engage in this practice. Given the large-scale loss of livestock over the life of the activity, however, this is not necessarily surprising, as households may simply have had fewer livestock to sell at endline. According to some focus groups, their communities still had not recovered from the 2010 drought in which entire communities lost nearly all their livestock. Households were

significantly less likely to sell small assets at endline compared to baseline, and significantly more likely to rely on migration (although the prevalence of migration was lower than that of selling off large assets). The DID analysis indicated that the difference between survey rounds for HI households was not significantly different than that for LI households (Table 15; Annex 3).

### 4.1.3 Resilience Capacities

**Livelihood diversification.** Overall, livelihood diversification was very low in the six PREG counties. At baseline, households relied on approximately 1.5 sources of income and/or food; this decreased to 1.2 at endline. There was no significant difference in how livelihood diversification between survey rounds changed for HI and LI households (Table 16, Annex 3).

**Assets.** Asset ownership decreased over time, but the change is not statistically significant. DID analysis showed no significant difference in the change in asset ownership for HI and LI households over time (Table 16, Annex 3).

**Social capital.** When asked whether households could rely on others for financial or in-kind support during the drought prior to each survey round, about 30 percent during the baseline and 40 percent during the endline indicated they could. Households reported that they could rely on approximately two different sources of support at endline, a significant increase from the first survey round. The most commonly cited source of support was relatives within a household's village/community. Though relatives outside of a household's village/community were a fairly common source, there was a noticeable increase in reaching out to non-relatives and to people outside of a household's immediate circle, including individuals in other tribes or ethnic groups. Qualitative findings suggest this may be due in part to an erosion of bonding social capital, driving greater reliance on more-distant sources of social support, including new markets and market linkages. The qualitative data also indicate that households that were able to cope with future shocks without adjustments were greatly affected by recent shocks and incurred debt that inhibited their traditional role of providing loans, food and other support within their communities during times of need. Shop owners were less willing or able than in the past to allow people to purchase food on credit. This is consistent with other findings that the rate of borrowing dropped drastically at endline.

Between baseline and endline, the increase in reliance on others was significantly more for LI households compared to HI households, specifically among non-relatives both within and outside of one's community (Table 17, Annex 3). The number of sources on which a household relied during the last drought increased more for LI households compared to HI households. Although there was no significant difference between the change from baseline to endline in whether a household would be able to rely on others in the future among HI and LI households, LI households were more likely than HI households to report they could rely on relatives outside of their village or community and on non-relatives within their village or community.

**Humanitarian assistance.** Reliance on humanitarian assistance was very low in both survey rounds (15 percent at baseline and 6 percent at endline), although the changes between survey rounds for HI and for LI households were not statistically different (Table 16, Annex 3).

Qualitative data suggest that—although diminished—most communities still received some form of assistance during times of crises, including food aid, cash, fodder, seedlings, vaccines, malaria nets, etc. The qualitative data suggest that although often too slow, too limited in duration, and insufficient overall, emergency humanitarian assistance layered with development activities was critical for dealing with shocks and stresses.

#### 4.1.4 Well-Being Outcomes

**Economic indicators.** The number of households living at or below the poverty line of USD 1.25 per day was higher at endline, though the difference from the baseline was not significant. Per capita daily expenditures (i.e., a proxy for income) declined significantly.

**Food security.** Moderate or severe household hunger increased significantly from baseline to endline.

**Child nutritional status.** Generally, the trend was toward improvements in all three measures of child nutrition (stunting, wasting and underweight) by endline, though none of the changes were statistically significant.

**Household ability to cope with future shocks or times of stress.** When asked about the household's ability to cope with future droughts and other stresses, households felt more confident at endline than at baseline in their ability to cope with shocks to their sources of income or food. At endline, households are more likely to believe in their ability to cope if they are able to rely on others, and own more assets.

Table 18 and Table 19 (Annex 3) show that the differences in well-being outcomes between survey rounds for HI and LI households were not statistically different for any of the four measures of well-being (expenditures, poverty level, moderate/severe hunger, and perceived ability to cope with future shocks).

## 4.2 PROGRAM IMPLICATIONS

Across the PREG I program area, there were large increases in reliance on people outside of one's own village, community, and/or ethnic group for financial and in-kind support during the latest drought. This pattern could reflect the impact of PREG I initiatives linking communities to markets, services, and support institutions. It could also signal that bonding social capital has weakened in that everyone's capacity for sharing (e.g., low food stocks, fodder, etc.) has been exhausted and people need to reach further out than their immediate—and more traditional—circles for support.

The insights from the qualitative indicate that the process of development envisioned in the theory of change has been experienced in different ways by different communities, but not necessarily influenced by PREG I activities. The qualitative sample included some communities that seemed more engaged in transformative changes, as captured by the level of local governance and collective action, the intensity of presence of local county agencies, and the range of activities

offered by NGOs and other actors. In these seemingly more-resilient communities, study participants described improvements in livelihood diversification leading to improved child nutrition; increased collective action and community cohesion; increased access to services (e.g., veterinary and human health care, insurance), technologies (e.g., mobile phones, refrigeration, farming practices), and education; and improvements in infrastructure (e.g., markets, roads, water points).

In more resilient communities, as described in the previous paragraph, FGDs reported a strong role of county government and a range of external actors providing support over the previous five to ten years, layered with emergency humanitarian assistance (e.g., Wajir, Marsabit). In one site in Wajir, for example, study participants described the role of county government to improve community infrastructure and technical assistance, including training, along with consistent support from NGOs, coupled with support from government and NGOs during droughts over the previous five years as resulting in a positive change in their response capacity. This external support leverages community-based pasture and natural resource management, annual disaster risk reduction planning meetings (at least in some communities), intra-community support systems (e.g., contributions for home construction), and informal safety nets such as local-level cash-for-work initiatives to support the neediest members of the community. These communities show a commitment to collective action and an ability to form effective partnerships with external resource providers, and project a vision of the future. It is not possible to determine at this point why one community holds this perspective, while others do not. The FGDs, however, do suggest that location close to a more urban area favors access to resources and project interventions. Although such insights may suggest that proximity to an urban area means a community might be more resilient, additional analysis with quantitative data would be needed to verify or refute such a possibility.

The goal of PREG I to enable the development of a flourishing livestock industry consistent with the vision of the Kenyan government is a difficult one to achieve. If PREG I meant to target the most vulnerable groups in northern Kenya, its intervention strategies, particularly the livestock value chains, were only realistically available to a limited number of households. The challenge facing the development community is to also accommodate those who are shifting into more diverse portfolios of livelihood activities, such as farming and small business. Many communities expressed a desire to educate their children, to expand training opportunities that could support livelihood diversification, and to support investments in technologies and infrastructure to support these aspirations (e.g., roads, electrification, market access, drought-tolerant seeds and livestock, health care facilities, access to water / irrigation). While many community FGDs articulated the capacity and desire to address problems and constraints through collective action, the data show a general need and desire for external support to facilitate a process of transforming livelihoods and managing shocks and stresses.

## 5 RECOMMENDATIONS

The section highlights key observations and associated recommendations relevant to future resilience programming in the ASALs of northern Kenya.

- In the ASALs of northern Kenya, the frequency of droughts, inter-ethnic conflict over a diminishing resource base, and devolution of government responsibilities have all accelerated a major transformation of the traditional pastoral livelihood. Thus, potential program activities that focus on income generation and diversification should be prioritized.
- Devolution has increased the presence of government across the ASALs, including increased investment in infrastructure such as livestock markets, services, and safety nets. The county development planning system and other NGO and development actors in the area should be leveraged for more effective PREG coordination and implementation, particularly around strengthening community-level disaster planning and response mechanisms (e.g., early warning systems, DRR strategies).
- Where PREG employs “system-level” interventions to strengthen transformative capacity, such as improving market infrastructure and training public service providers, strategies of inclusion should be prominent so that a broader range of households and communities are able to participate and perceive these interventions as transformative. This is particularly important with educational opportunities provided through the program, as there is widespread interest in education—particularly of children—and in training in business practices and farming as a means of acquiring sustained employment and income.

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## ANNEX 1: FOCUS GROUP TOPICAL OUTLINE

### Livelihoods (How do People Make a Living)

1. Characteristics of current livelihoods.
  - Diversity of activities (primary and secondary activities)
  - Resources used to do these activities (e.g., land, water, rangeland, assets)
  - How people use these resources
2. Access to and the use of financial resources, such as micro-credit and savings.
3. Changes in these livelihoods over the last 5–10 years.
4. Extent of linkages to external actors and external investment changes over the last 5–10 years. Focus on impacts. Probes can include:
  - GoK actions in the region (i.e. available government services)
  - NGO/UN/project activities in the region
  - Investments schools and health care
  - Investment in communication technology, rural infrastructure

### Participation in Livestock Markets

5. Describe common livestock practices in this region. Probes include:
  - Herd and pasture management
  - Variability in herd size across household
  - Veterinary practices
  - Fodder and purchased inputs
  - Principal livestock products
  - Normal patterns of selling animals/animal products
6. Changes in livestock and livestock product markets over the last 5–10 years? Possible probes include:
  - More or less market activity
  - More or less infrastructure investment (slaughterhouses, holding pens, dip tanks, milk collection centers, dairy processing plants)
  - Investment by government/private sector/NGOs
  - Technical assistance and training (e.g., milk quality preservation/sanitation practices, meat slaughtering/processing, poultry production)

7. Availability and use of livestock and/or crop insurance. Who are the principal users?
8. Constraints to participation of households in these livestock markets. Possible probes include:
  - Prices, traders, market information
  - Poor infrastructure/transport
  - Animal disease, lack of community animal health workers, professional veterinary products and services
  - Lack of necessary feed inputs
  - Lack of training in business skills and management
  - Government of Kenya regulations and controls
9. Changes in the role of women in livestock production and processing.

### Shocks and Stressors

10. Describe the main shocks this community has experienced over the last 5–10 years.
11. With reference to the last major shock, please describe the main effects on households and the community? Probes might include:
  - Crop and livestock losses
  - Loss of household assets
  - Increase in prices
  - Health problems
12. Different impacts of shock among community groups: among men and women, youths, elderly, wealthier and poorer, etc.

### Household Responses to Shocks, Stresses, Challenges

13. Types of responses by households. Probes might include:
  - Reduced food consumption: Less/ate lower quality food
  - Sought casual wage labor
  - Sold/slaughtered livestock
  - Borrowed money/used savings
  - Sought help from family/friends: local and abroad, remittances
  - Migration—temporary for work; temporary for pasture; permanent
  - Received outside assistance from GoK/NGO/UN agency

14. Differences in responses for different households in the community: which households and why?
15. Changes in household responses over the last 5–10 years.

### Community Responses to Shocks / Impacts of Shocks on Community

16. With reference to the most recent shock, kinds of community responses:
  - Sharing of resources among families, collective labor to support household losses
  - Collective action to build or improve community infrastructure (e.g., roads, markets, schools, water, health care facilities, etc.)
  - Collective management of natural resources (e.g., rangelands protection, water and soil conservation)
  - Cooperative actions with other communities to reduce/respond to shocks that affect multiple communities
17. Roles of community leaders in organizing collective action. Differences between men and women, youth and elderly, etc. in terms of who participates in which types of collective action.
18. Changes in community responses over the last 5–10 years.
19. Ways shocks have affected community solidarity. (*Do these shocks have an impact on community solidarity and social capital? On the ability of the community to collaborate and work together and help each other?*) Possible areas to probe:
  - Changes in trust within community among households and with community leadership
  - Changes in community cooperation and mutual help (formal and informal)
  - Changes in conflict/security inside and outside the community
20. Outside responses to shocks (e.g. GoK, NGO) and changes over the last 5–10 years? Possible probes include:
  - Type of response (e.g., food, cash, fodder, seeds)
  - Effectiveness of response to help the community
21. Community suggestions to improve response capacity. (*How can the community become better prepared?*)
  - More collective action
  - More outside support

## Aspirations / Planning for the Future

22. Anticipated changes over the next 10 years. (*What do community members think will change over these 10 years?*)
23. Community plans or projects over the next 10 years (*Does the community have any projects planned for the future? What is the community discussing or doing now to prepare for future changes?*) Possible prompts include:
  - Community disaster preparedness and response plans
  - Investments in infrastructure, irrigation, health, education
  - Natural resource management
  - Collective action projects
24. Changes through time in the roles of youth and women/girls (*Does the community think that its youth and women/girls will have a different future?*) Probe might include:
  - The role of education for youths/girls
  - The role of youths in pastoralist culture and society
25. Perception of the community's ability to achieve the vision for the future (*Does the community think that it has the ability to make changes and better prepare for the future? What is needed to solve problems into the future?*) Probe might include:
  - Actions that the community can take to move forward
  - The role of outsiders (GoK, NGOs, etc.)

**Final Comments:** Do you have any questions for the team, or anything else you would like us to document?

**Asante Sana!**

## ANNEX 2: KEY INFORMANT INTERVIEW TOPICAL OUTLINE

### Recruitment Criteria: KIIs (Village, Sublocation, Contry)

1. Community leader, clan chiefs, imam/religious leader (VILLAGE)
2. Headmaster/mistress/ principal, head teacher (VILLAGE)
3. Youth leaders, Age grade leader (VILLAGE)
4. Health worker (VILLAGE, SUBLOCATION)
5. Local merchants (inputs, livestock products, etc.) (SUBLOCATION)
6. Livestock trader (SUBLOCATION)
7. Local implementing partner staff (NGOs, WFP Staff Member) (SUBLOCATION/COUNTY)
8. Local financial institutions (SUBLOCATION, COUNTY)
9. Insurance representatives (SUBLOCATION, COUNTY)
10. NDMA staff (COUNTY)
11. Agriculture/livestock extension agents/staff (SUBLOCATION, COUNTY)
12. Slaughterhouse manager (SUBLOCATION COUNTY)

### Generic Key Informant Interview Topical Guide—Tailored to Each KI

**Instructions:** *The team supervisor will inquire in the region and decide on which KIIs are available and feasible to meet. Some are available in the village (local leader), some at the sublocation (merchants), and some at the county level (NDMA staff). The supervisor will then decide the distribution of KIIs among the team members, then adapt the knowledge categories below to fit the particular key informant. For each key informant, write out topics to be covered in the interview, and attach to the interview report.*

1. What do you do? What are your roles/responsibilities?
2. Who do you work with? Please describe the population(s) you work with.
3. How have your activities and responsibilities changed in the last 5–10 years?
4. How has the region changed in the last 5–10 years (how and why)?
5. What was the cause or reason for that change?
6. Describe what changes you see you in the future
7. Are you familiar with REGAL/PREG projects? (If appropriate. OR What projects do you work with?)

## ANNEX 3: FINDINGS FROM NORTHERN KENYA BASELINE AND ENDLINE SURVEYS: OVERLAPPING HIGH INTENSITY AND LOW INTENSITY SUBLOCATIONS

This annex presents results of analyses using DID methods to compare differences between survey rounds for low-intensity (LI) households to differences between survey rounds for high-intensity (HI) households. HI counties (REGAL-AG and REGAL-IR) at baseline are Marsabit, Isiolo, and Turkana. Two counties (Garissa and Wajir) were omitted from the baseline due to security issues in those areas. The LI counties (FFA/HA) at baseline are Tana River, Samburu, Mandera and Baringo. As described above in Section 2.1.1 of the main report, the sample design was modified for the endline to better capture program participation. In particular, the sampling frame used for the endline was defined into HI and LI categories based on information about project interventions at the level of sublocations within the PREG counties. In order to maintain a consistent sampling frame across the two survey rounds, the DID analysis presented in this annex is conducted only on the sample of sublocations that were identified by PREG as being in HI or LI categories that were included in both baseline and endline surveys.

Tables in this annex show percentages or means for LI and HI in baseline and endline survey rounds. The DID values in the tables are the estimated effect of high-intensity program participation on HI households compared to low-intensity program participation on LI households. Tests of statistical significance show whether the effect is significantly different from zero (no effect). Mathematically,  $DID = (HI_{endline} - HI_{baseline}) - (LI_{endline} - LI_{baseline})$ .

In order to incorporate survey weights, DID estimation used multivariate regression equations of the following form:

$$Y = \alpha + \beta_1 Intensity + \beta_2 Round + \beta_3 (intensity * round) + \varepsilon$$

where

Y is the outcome of interest

Intensity is programming intensity (LI or HI),

Round is survey round (baseline or endline), and

Intensity \* round is the interaction of the two terms.

The Logit regression estimator was used to estimate nominal (0–1) outcomes, Ordinary Least Squares (OLS) was used to estimate interval outcomes, and Generalized Linear Model (GLM) was used to estimate the logarithm of expenditures.



## Limitations

The application of the DID analysis on the restricted sample of households that fall in the HI and LI sublocations as defined by the reported locations of PREG interventions is intended to improve the comparability of the sampled households across the two rounds, as the samples from the two rounds are drawn from the same sampling frame. However, this restriction of the sample does not completely remove the possibility of selection bias of sampled households across the two groups. It is still possible that there may be non-random differences in household characteristics between households in the LI and HI sublocations, perhaps due to targeting strategies of PREG interventions.

One implication of applying DID analysis to this restricted sample is that the sample sizes included in the analysis for both rounds is much smaller than the full sample. This reduction of the sample sizes reduces the accuracy of the sample estimates, and correspondingly reduces the ability to statistically detect difference in differences across the two survey rounds.

## Findings

Table 14 shows the percentage of LI and HI households engaged in various livelihood activities at baseline and endline. The table includes activities reported by at least 5 percent of households in either round. The decrease in wage labor was significantly greater for HI households than LI households i.e., HI households reported a larger drop in wage labor than did LI households.

Table 14. Household engagement in select livelihood activities

	Low intensity		High intensity		DID	sig
	Baseline	Endline	Baseline	Endline		
Livelihood activities (%) <sup>1</sup>						
Farming/crop production and sales	36.3	30.8	10.4	0.7	-4.2	ns
Livestock production and sales	35.0	52.0	31.1	38.4	-9.7	ns
Wage labor	24.3	22.4	24.1	5.1	-17.2	*
Salaried work	35.9	20.6	22.8	19.5	12.0	ns
Sale of wild/bush products	3.5	5.0	18.9	31.6	11.2	ns
Other self-employment/own business	23.5	16.6	23.1	5.2	-11.0	ns
<i>n</i>	105	226	210	401		

\* Statistically significant difference at  $p < 0.05$ ; ns denotes no statistically significant difference.

<sup>1</sup> Includes activities reported by at least 5% of households in either round.

<sup>†</sup> Sublocations common to both survey rounds.

Table 15 shows the percentage of households engaging in various coping strategies in the face of shocks and/or stresses, comparing LI at baseline and endline to HI at baseline and endline. There were no statistically significant differences. Changes in the use of coping strategies were not significantly different for HI compared to LI households.

Table 15. Household use of coping strategies

	Low intensity		High intensity		DID	sig
	Baseline	Endline	Baseline	Endline		
Households reporting at least one coping strategy (%)	37.1	40.6	40.3	42.3	-1.5	ns
<i>n</i> <sup>†</sup>	105	226	209	401		
Types of adaptations (%)						
Changed income or food sources	37.1	0.3	35.7	1.6	2.7	ns
Added income or food sources	19.5	21.7	8.4	3.5	-7.1	ns
Migration of one or more HH members	3.9	10.2	6.1	21.4	8.9	ns
Sold large assets	48.7	25.3	48.3	30.9	6.0	ns
Sold small assets	57.1	0.0	55.1	0.4	2.4	ns
<i>HHs using at least one coping strategy</i>	52	95	100	174		

ns denotes no statistically significant difference.

<sup>†</sup> Sublocations common to both survey rounds.

Table 16 shows the results of DID analysis comparing baseline-to-endline changes in assets, livelihood diversification and use of humanitarian assistance for LI households to HI households. The table presents the mean number of assets and livelihood activities and the percentage of households reporting the use of relief as a source for food. There were no statistically significant differences. Changes between rounds were not significantly different for HI compared to LI households.

Table 16. Assets, livelihood diversification, relief

	Low intensity		High intensity		DID	sig
	Baseline	Endline	Baseline	Endline		
Assets index (mean, 0–34)	6.5	6.5	5.6	4.0	-1.5	ns
Number of livelihood activities (mean, 0–12)	1.6	1.5	1.4	1.1	-0.2	ns
Relief as a source of cash or food (%)	9.0	3.7	17.8	7.2	-5.3	ns
<i>n</i> <sup>†</sup>	105	226	210	401		

ns denotes no statistically significant difference.

<sup>†</sup> Sublocations common to both survey rounds.

Table 17 shows the results of DID analysis of social capital. The first row of the table shows the percentage of households reporting that they relied on others. The increase for HI households was lower than for LI households, a difference of 25.5 percent. Of the types of social networks, the increase in reliance on non-relatives in the community was 36.3 percent lower for HI households than LI households. The increase in reliance on non-relatives outside the community was 19.8 percent lower for HI than LI households. HI households also reported less of an increase in the number of sources on which they relied during the last drought. When asked about

potential sources of support in the future, the increase in HI households reporting that they could rely on relatives outside of their community was 28.6 percent lower than for LI households. The increase in the percentage of HI households reporting that they could rely on non-relatives within the community was 26.0 percent less than for LI households.

Table 17. Use and availability of social capital

	Low intensity		High intensity		DID	sig
	Baseline	Endline	Baseline	Endline		
Households that relied on others	22.6	50.0	36.1	38.0	-25.5	+
<i>n</i>	105	226	210	401		
Types of social networks (% HHs)						
Relatives in my community	69.9	76.3	69.6	64.4	-11.6	ns
Relatives outside community	31.4	55.5	42.2	49.8	-16.5	ns
Non-relatives in my community	10.4	49.9	36.6	39.7	-36.3	**
Non-relatives outside community	3.2	19.5	25.1	21.6	-19.8	*
Non-relatives outside of tribe/ethnic group	0.0	16.9	8.9	39.5	13.7	ns
Count of sources on which household relied during last drought	1.1	2.2	1.8	2.1	-0.7	*
<i>HHs that relied on others</i>	31	118	99	162		
Households reporting that they will be able to rely on others in the future	46.6	93.5	62.3	87.3	-21.9	ns
<i>n</i>	105	225	210	400		
Relatives in my village/community	35.3	81.2	48.3	70.9	-7.6	ns
Relatives outside my village/community	15.6	75.8	30.8	59.8	-28.6	*
Non-relatives in my village/community	7.2	48.7	21.5	39.5	-26.0	*
Non-relatives outside village/community	5.2	37.0	8.4	41.6	5.5	ns
Non-relatives outside of tribe/ethnic group	1.4	27.2	4.7	32.5	3.6	ns
<i>HHs that can rely on others in the future</i>	57	208	140	350		

<sup>†</sup> Sublocations common to both survey rounds.

Statistically significant difference at \* $p < 0.05$  and \*\* $p < 0.01$ ; ns denotes no statistically significant difference.

Table 18 shows changes in well-being indicators for LI and HI households between survey rounds. There were no statistically significant differences.

Table 18. Well-being indicators

	Low intensity		High intensity		DID	sig
	Baseline	Endline	Baseline	Endline		
Households reporting moderate or severe hunger (%)	33.4	42.2	48.4	76.9	19.7	ns
<i>n</i>	93	225	184	390		
Expenditures and poverty						
PCD consumption expenditure in USD in 2010 prices at 2005 PPP	3.86	2.61	3.34	2.05	-0.1	ns
PCD consumption expenditure in USD in 2010 prices at 2011 PPP	2.27	1.54	1.97	1.21	-0.1	ns
% HH living below \$1.25 poverty line at 2005 PPP	51.7	64.8	64.1	77.5	0.3	ns
% HH living below \$1.90 poverty line at 2011 PPP	37.9	50.3	53.9	68.5	2.1	ns
Households' ability to cope with future shocks (%)						
Unable to cope	20.2	27.8	35.7	50.9	7.5	ns
Able to cope at significant cost to well-being	39.4	60.5	35.5	39.0	-17.7	ns
Able to cope without significant cost	40.4	11.7	28.7	10.2	10.1	ns
<i>n</i>	105	223	210	391		

<sup>†</sup> Sublocations common to both survey rounds.  
ns denotes no statistically significant difference.

Table 19 shows changes in children's anthropometric indicators between survey rounds, comparing LI to HI households. There were no statistically significant differences.

Table 19. Children's anthropometric indicators

	Low intensity		High intensity		DID	sig
	Baseline	Endline	Baseline	Endline		
Stunting						
Moderate to severe stunting (Z<-2SD)	31.1	25.7	31.1	20.6	-5.0	ns
Severe stunting (Z<-3SD)	15.9	12.4	13.1	5.4	-4.1	ns
Underweight						
Moderate to severe underweight (Z-2SD)	14.6	17.7	21.5	18.2	-6.3	ns
Severe underweight (Z-3SD)	10.4	1.9	4.1	1.7	6.2	ns
Wasting						
Moderate to severe wasting (Z<-2SD)	14.6	8.5	15.0	12.3	3.3	ns
Severe wasting (Z<=-3SD)	5.9	0.9	4.3	1.7	2.4	ns

	Low intensity		High intensity		DID	sig
	Baseline	Endline	Baseline	Endline		
<i>n</i>	61	145	151	262		

<sup>†</sup> Sublocations common to both survey rounds.

ns denotes no statistically significant difference.

## Summary

The DID analysis compares changes in outcomes between baseline and endline for HI (treatment group) and LI (control group) households. Overall, there were few statistically significant results; changes in most outcomes between baseline and endline for HI households were not significantly different than those for LI households. A notable exception involves social capital, where LI households show a much higher degree of reliance on an expanded circle of relatives and non-relatives for help in dealing with a shock or stressor than HI households. The lack of significant difference between changes experienced by HI and by LI households over time may, in part, be influenced by the small sample sizes available for this analysis, which restricted the baseline sample to those sublocations that overlapped with the endline sample.

With few exceptions, the direction of change between baseline and endline was the same for HI and LI households. In many cases, outcomes in both groups got worse over time. The only statistically significant exception was LI households relying more heavily on non-relatives outside of their community at endline than baseline; in contrast, HI households reported a small decrease in reliance on this source of social capital across survey rounds.

## ANNEX 4: SAMPLE DESIGN FOR THE 2013, 2015 AND 2018 SURVEYS

### 4.1 PURPOSE OF THE SURVEYS, AND ZOI AND PROGRAMMING INTENSITY AREA DEFINITIONS

#### 4.1.1. 2013 Survey

The 2013 survey served two purposes:

1. As a population-based survey (PBS) designed to measure baseline values for Feed the Future performance indicators for the area covered by nine ASAL counties of the Feed the Future ZOI in northern Kenya; and
2. As a baseline for a resilience impact evaluation designed to measure the changes in household resilience capacities and outcomes in areas with different levels of planned resilience programming intensity.<sup>47</sup>

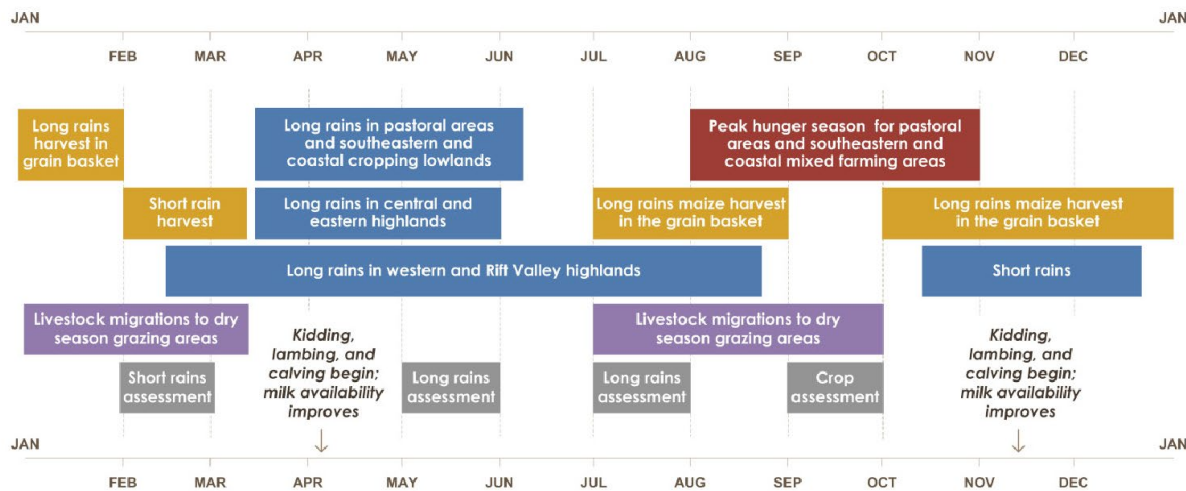
The nine counties identified in the northern Kenya ZOI in 2013 were Baringo, Garissa, Isiolo, Mandera, Marsabit, Samburu, Tana River, Turkana, and Wajir.

The levels of planned resilience programming intensity were as follows: The Low-Intensity (LI) area was where only USAID-funded World Food Programme humanitarian assistance would be/was provided and included Baringo, Mandera, Samburu and Tana River counties. The Medium-Intensity (MI) stratum area would receive humanitarian assistance and USAID-funded Resilience and Economic Growth in the Arid Lands Improving Resilience (REGAL-IR) support and included Isiolo, Turkana and Wajir counties. The High Intensity (HI) area would receive HA, REGAL-IR, and REGAL Accelerating Growth (REGAL-AG) investments and included Garissa and Marsabit counties. Table 20 shows the distribution of counties into program intensity categories as defined prior to 2013 data collection and the population in each county provided in the 2013 baseline report.

The 2013 survey data were collected then January–February 2013, before the long rains in the pastoral areas when livestock are migrating to dry-season grazing areas (Figure 3).

<sup>47</sup> Resilience programming initially referred to that of the Resilience and Economic Growth in the Arid Lands (REGAL) project, then was expanded to include all resilience programming under the USAID-Kenya Partnership for Resilience and Economic Growth (PREG) I project.

Figure 3: 2013 Seasonal calendar



Source: Famine Early Warning System (FEWS Net). Food Security Brief. December 2013, in Feed the Future Northern Kenya 2015 Zone of Influence Interim Assessment Report, page 15

#### 4.1.2. 2015 Survey

The 2015 survey served two purposes:

1. As a midline population-based survey (PBS) designed to provide point estimates for Feed the Future performance indicators for the five ASAL counties now defined as comprising the ZOI in northern Kenya; and
2. As a midline for the PREG I impact evaluation to compare indicator values between HI and LI areas, HI and LI intensity areas, and MI and LI areas, covering the original nine-county area.

The Feed the Future ZOI was redefined in the 2015 survey to encompass only five counties: Garissa, Isiolo, Marsabit, Turkana, and Wajir. The five counties were all in the MI or HI programming areas. Garissa, Turkana, and Wajir in MI areas; and Isiolo and Marsabit in HI areas. The remaining four counties, Baringo, Mandera, Samburu, and Tana River, were in the LI program area, which was no longer considered part of the Feed the Future ZOI. The LI counties were included in the survey because they are considered the control group for the PREG I IE.

The 2015 survey data were collected in May–June 2015, during the long rains in pastoral areas.

### 4.1.3. 2018 Survey

The 2018 survey served two purposes:

1. As the endline survey for the initial (PREG I) impact evaluation; and
2. As the baseline survey for an impact evaluation of the new round of PREG resilience programming (PREG II).

Given that the purposes of the 2018 survey were exclusively related to impact evaluation needs, it did not collect data at the Feed the Future ZOI-level.

The programming intensity strata were reduced to two in the 2018 survey: The LI (humanitarian assistance only) stratum included sublocations in Baringo, Mandera, Samburu, and Tana River counties. MI and HI were collapsed into a single HI stratum, defined as sublocations that received humanitarian assistance plus other resilience-enhancing interventions within Garissa, Isiolo, Marsabit, Turkana and Wajir counties. Sublocations in these five counties that only received humanitarian assistance were not included in the LI stratum and thus were excluded entirely from the 2018 survey.

The 2018 survey data were collected in September 2018, in the lean season.

## 4.2 SAMPLE DESIGN

### 4.2.1. 2013 Survey

Due to security issues near the Somali border at the time of the 2013 survey, Garissa, Mandera and Wajir counties were excluded from the sampling frame. Thus, the PBS and the PREG I impact evaluation baseline sample only covered six of the nine ASAL counties of the ZOI in northern Kenya: Baringo, Isiolo, Marsabit, Samburu, Tana River and Turkana. The six HI counties in the sample were divided into three programming intensity strata defined at the county level, based on the programming intensity area described in Section 4.1.1. The LI stratum included Baringo, Samburu and Tana River counties. The MI stratum included Isiolo and Turkana counties. The HI stratum included Marsabit County.

Each stratum was stratified by county and within county, by urban and rural. The overall sample of 2,136 households in 140 clusters was allocated among the three strata (LI–724 households, 46 clusters; MI–705 households, 47 clusters; HI–705 households, 47 clusters), then EAs within each stratum were selected using probability-proportional-to-size methodology (see Table 20). The samples drawn in each of the three strata were population-based, that is, all households within the counties constituted the sampling frame from which surveyed households were drawn. In order to maximize the number of clusters while at the same time conforming to time constraints and logistics requirements, KNBS used existing listings and protocols to select between 14 and 18 households per cluster, resulting in a total projected sample of 2,136 households over 140 clusters.

Table 20 presents the distribution of the 2013 survey sample.



Table 20: 2013 survey sample

Strata/program	County	Population			Sample							
		People	Households	Distribution of households % within stratum or among strata	Clusters			Households				
					Rural	Urban	Total	Rural	Urban	Total	Distribution of total sample households % within stratum or among strata	
LI: HA only	Baringo	555,561	110,649	54%	12	5	17	216	90	306	42%	
	Samburu	223,947	47,354	23%	11	3	14	165	45	210	29%	
	Tana River	240,075	47,414	23%	13	2	15	182	28	210	29%	
LI sub-total		1,019,583	205,417	49%	36	10	46	563	163	726	34%	
MI: HA+REGAL IR	Isiolo	143,294	31,326	20%	9	7	16	135	105	240	34%	
	Turkana	855,399	123,191	80%	22	9	31	330	135	465	66%	
MI sub-total		998,693	154,517	37%	31	16	47	465	240	705	33%	
HI: HA+REGAL-IR+REGAL-EG	Marsabit	291,166	56,941	100%	37	10	47	555	150	705	100%	
HI sub-total		291,166	56,941	14%	37	10	47	555	150	705	33%	
TOTAL		2,309,442	416,875		104	36	140	1,583	553	2,136		

Field teams were unable to access five clusters (78 households). Three of these clusters were excluded because they were inaccessible due to flooding, and two were excluded due to long travel times (five-day journey to one cluster). Two of the clusters were in Turkana, and one each were in Baringo, Isiolo and Marsabit.

Of the remaining 2,058 households, field teams were unable to locate 158 households. Enumerators contacted 1,900 households, of which 1,760 consented to be interviewed, for an overall non-response rate of 17.6 percent. No information is provided in the baseline report on the distribution of non-response by stratum.

The 2018 survey draft report includes a table that provides the 2013 realized sample size, which is less than the 1,760 documented in the 2013 report (Table 21). However, based on the data provided, it does not appear that there is any large bias among the counties in terms of non-response.

Table 21: Initial and realized 2013 survey sample

County	Initial Sample	Realized Sample	Realized sample / Initial sample
Baringo	306	234	76%
Samburu	210	158	75%
Tana River	210	180	86%
Turkana	465	364	78%
Isiolo	240	191	80%
Marsabit	705	588	83%
<b>Total</b>	<b>2,136</b>	<b>1,715</b>	<b>80%</b>

#### 4.2.2. 2015 Survey

The 2015 survey collected data over the full nine-county area: Baringo, Garissa, Isiolo, Mandera, Marsabit, Samburu, Tana River, Turkana, and Wajir. The sample was designed to be large enough to measure differences among intensity levels of REGAL and humanitarian assistance programming for the impact evaluation, and provide point estimates for Feed the Future indicators at the new five-county ZOI level.

The three counties excluded at baseline due to security concerns in 2013, Garissa, Mandera and Wajir, were included in the 2015 sampling frame and sample. There had also been shifts in where REGAL-AG was programming after 2013 data were collected, which led to Garissa being redefined as MI (although no data were collected from Garissa in 2013), and Isiolo moved from MI to HI.

The nine counties in the sample were thus divided into three slightly modified programming intensity strata defined at the county level. The LI HA-only stratum included Baringo, Mandera, Samburu, and Tana River. The MI HA+REGAL-IR stratum included Garissa, Turkana, and Wajir. The HI HA+REGAL-IR+REGAL-EG program area included Isiolo and Marsabit.

Each stratum was stratified by county and within county, by urban and rural. The overall target sample of 2,100 households in 132 clusters was allocated equally among the three strata with 44 EAs per stratum. Then EAs within stratum were selected using PPS. In the LI and MI areas, KNBS selected EAs from the 2009 Population and Housing Census of Kenya. In the HI area, Feed the Future FEEDBACK drew a subsample of the Kenya DHS EAs. Two different frames were the source for EAs in the three areas. Initially, the sample design distributed the 2,100-household sample over the three intensity areas with the number of EAs in each intensity level proportional to population. Accordingly, KNBS selected EAs in March 2015. Listing took place in April, several weeks before survey fieldwork, so that Westat analysts could select the sample and include household identification information in ODK prior to fieldwork in May. However, PPS sampling across the intensity areas meant that the LI areas had the most EAs and the HI area had the least EAs (17). In late April, it was determined that the sample in the HI area was insufficient for analysis. KNBS was concerned about re-sampling to supplement the 17 EAs. In May, it was decided to not use the 17 EAs and to select 44 EAs from the recently completed Demographic and Health Survey. Kimetrica conducted fieldwork for that survey and had access to the sample information.

In the second stage, 16 households within each selected EA were selected randomly from a list of eligible households in the MI and LI areas, while 18 households were selected in the HI area due to potentially higher non-response.

Table 22 presents the distribution of the 2015 survey sample.

Table 22: 2015 survey sample

Strata/program	County	Population			Sample							
					Clusters			Households				
		People	Households	Distribution of HHs % within stratum or among strata	Rural	Urban	Total	Rural	Urban	Total	Distribution of total sample households % within stratum or among strata	
LI - HA only	Baringo	555,561	110,649	33%	11	2	13	176	32	208	30%	
	Mandera	1,025,756	125,497	38%	12	3	15	192	48	240	34%	
	Samburu	223,947	47,354	14%	6	2	8	96	32	128	18%	
	Tana River	240,075	47,414	14%	6	2	8	96	32	128	18%	
LI sub-total		2,045,339	330,914	50%	35	9	44	560	144	704	33%	
MI - HA+REGAL IR	Garissa	143,294	31,326	13%	9	4	13	144	64	208	30%	
	Turkana	855,399	123,191	51%	13	4	17	208	64	272	38%	
	Wajir	661,941	88,574	36%	11	3	14	176	48	224	32%	
MI sub-total		1,660,634	243,091	37%	33	11	44	528	176	704	33%	
HI - HA+REGAL-IR+REGAL-EG	Isiolo	143,294	31,326	35%	11	10	21	198	180	378	51%	
	Marsabit	291,166	56,941	65%	16	4	20	287	72	359	49%	
HI sub-total		434,460	88,267	13%	27	14	41	415	252	737	34%	
TOTAL		4,140,433	662,272		95	34	129	1503	572	2154		

### 4.2.3. 2018 Survey

The LI stratum sampling frame included all households in the sublocations within the four counties (Baringo, Mandera, Samburu, and Tana River). The new HI stratum sampling frame only included households in purposively selected sublocations within the five counties (Garissa, Isiolo, Marsabit, Turkana and Wajir). The HI stratum was further categorized into Low, Medium, and High strata to indicate intensity of resilience programming based on information provided by USAID/Kenya. The sublocations selected were those in which the PREG project was or is carrying out resilience programming. Of all the activities that had taken place over the five years of PREG I, some were completed by the time of the 2018 survey, and some were still on-going and anticipated to continue under PREG II. The sublocations are all at the KNBS-defined Admin 5 level (Admin 1 = County, Admin 2 = District, Admin 3 = Division, Admin 4 = Location, Admin 5 = Sublocation).

The overall sample of 3,116 households in 107 clusters was allocated to the LI strata (1,520 households) and HI strata (1,596 households), and the three resilience programming intensity strata: Low–541 households, 19 clusters; Medium–505 households, 19 clusters; High–550 households, 19 clusters). EAs within each HI and LI stratum were selected using PPS.

Table 23 presents the distribution of the 2018 survey sample.

Table 23: 2018 survey sample

Strata/ program	County	Population			Sample							
		People	Households	Distribution of HHs % within stratum or among strata	Clusters			Households				
					Rural	Urban	Total	Rural	Urban	Total	Distribution of total sample households % within stratum or among strata	
LI: HA only	Baringo PREG sublocations	6,635	1,301	1%	2	0	2	60	0	60	4%	
	Mandera PREG sublocations	304,751	59,755	47%	19	3	21	547	90	637	42%	
	Samburu PREG sublocations	163,690	32,096	25%	9	4	13	270	119	389	26%	
	Tana River PREG sublocations	175,644	34,440	27%	12	3	15	344	90	434	29%	
LI sub-total		650,719	127,592	42%	42	10	51	1221	299	1520	49%	
HI: HA + other resilience interventions	Garissa PREG sublocations	267,541	52,459	30%	5	9	14	147	242	389	24%	
	Isiolo PREG sublocations	106,238	20,831	12%	4	3	7	120	90	210	13%	
	Marsabit PREG sublocations	83,992	16,469	9%	8	1	9	235	27	262	16%	

Strata/ program	County	Population			Sample							
		People	Households	Distribution of HHs % within stratum or among strata	Clusters			Households				
					Rural	Urban	Total	Rural	Urban	Total	Distribution of total sample households % within stratum or among strata	
	Turkana PREG sublocations	215,801	42,314	24%	12	3	15	319	90	409	26%	
	Wajir PREG sublocations	230,127	45,123	26%	10	1	11	296	30	326	20%	
HI sub-total		903,699	177,196	58%	39	17	56	1117	479	1596	51%	
TOTAL		1,554,41	304,788		81	27	108	2338	778	3116		

*Table 24: Initial and realized PREG II baseline sample*

County	Initial Sample	Realized Sample	Realized sample / Initial sample
Baringo	60	58	97%
Mandera	637	608	95%
Samburu	389	354	91%
Tana River	434	382	88%
Garissa	389	341	88%
Isiolo	210	188	90%
Marsabit	262	216	82%
Turkana	409	364	89%
Wajir	326	309	95%
<b>Total</b>	<b>3,116</b>	<b>2,820</b>	<b>91%</b>



## ANNEX 5: PARTICIPATION IN PREG INTERVENTIONS BY COUNTY

Table 25: Participation in PREG-supported trainings

Project Participation Category	Low Intensity Counties					High Intensity Counties						Total Sample
	All	Baringo	Mandera	Samburu	Tana River	All	Turkana	Wajir	Garissa	Isiolo	Marsabit	
<b>Trainings</b>												
Alternative livelihoods/income-generating activities	5.2	25.0	7.1	2.3	6.3	13.5	9.5	3.7	23.8	17.6	15.0	10.3
Livestock production practices/health/management	10.4	0.0	14.3	14.0	0.0	9.5	14.3	11.1	4.8	0.0	12.5	9.9
Crop production practices	9.1	75.0	0.0	9.3	0.0	2.4	0.0	3.7	9.5	0.0	0.0	4.9
Crop or livestock marketing	2.6	0.0	7.1	2.3	0.0	3.2	0.0	0.0	4.8	0.0	7.5	3.0
Business/financial/accounting practices	18.2	50.0	14.3	23.3	0.0	7.9	4.8	3.7	19.0	5.9	7.5	11.8
Rangeland management	2.6	0.0	0.0	4.7	0.0	4.8	4.8	0.0	4.8	5.9	7.5	3.9
Nutrition training	16.9	0.0	28.6	20.9	0.0	29.4	14.3	37.0	38.1	5.9	37.5	24.6
Savings/microfinance	3.9	25.0	0.0	2.3	6.3	5.6	0.0	7.4	0.0	5.9	10.0	4.9
WASH practices	33.8	25.0	7.1	37.2	50.0	30.2	33.3	25.9	14.3	29.4	40.0	31.5
Conflict management	6.5	0.0	7.1	4.7	12.5	10.3	0.0	7.4	19.0	17.6	10.0	8.9
Life skills (hygiene/family planning, etc.)	32.5	25.0	28.6	34.9	31.3	27.8	28.6	29.6	23.8	11.8	35.0	29.6
Youth skills training (apprenticeship/internship, etc.)	2.6	0.0	0.0	4.7	0.0	6.3	4.8	3.7	19.0	5.9	2.5	4.9
Other (specify)	11.7	0.0	21.4	4.7	25.0	20.6	28.6	29.6	9.5	35.3	10.0	17.2

Project Participation Category	Low Intensity Counties					High Intensity Counties						Total Sample
	All	Baringo	Mandera	Samburu	Tana River	All	Turkana	Wajir	Garissa	Isiolo	Marsabit	
<i>Percent of households</i>												
<b>N (number of cases reporting any training)</b>	77	4	14	43	16	126	21	27	21	17	40	203

Table 26: Participation in PREG-supported groups

Project Participation Category	Low Intensity Counties					High Intensity Counties						Total Sample
	All	Baringo	Mandera	Samburu	Tana River	All	Turkana	Wajir	Garissa	Isiolo	Marsabit	
<i>Percent of households</i>												
<b>Groups</b>												
Savings and loan groups (VSLA, REAP groups, BOMA groups, etc.)	45.6	58.6	0.0	40.6	52.6	24.8	38.5	3.8	38.9	25.0	34.8	36.8
Livestock management associations (LMA, etc.)	1.3	0.0	10.0	1.6	0.0	4.3	0.0	7.7	25.0	0.0	0.0	2.5
Livestock producer groups	2.5	0.0	10.0	3.1	1.8	2.6	0.0	3.8	8.3	0.0	2.2	2.5
Self-help groups (ADESO groups, etc.)	23.1	34.5	10.0	25.0	17.5	23.1	38.5	7.7	41.7	25.0	21.7	23.1
Women groups (GIRL model, etc.)	18.1	17.2	30.0	25.0	8.8	33.3	46.2	34.6	41.7	20.0	32.6	24.5
Mothers' groups	9.4	0.0	20.0	10.9	10.5	14.5	30.8	19.2	16.7	15.0	6.5	11.6
Village committees (water management, NRM, conflict management health, school, e	5.6	10.3	0.0	4.7	5.3	5.1	7.7	7.7	8.3	5.0	2.2	5.4

Project Participation Category	Low Intensity Counties					High Intensity Counties						Total Sample
	All	Baringo	Mandera	Samburu	Tana River	All	Turkana	Wajir	Garissa	Isiolo	Marsabit	
<i>Percent of households</i>												
Ward level committees (WARD adaptation planning committee, etc.)	1.3	0.0	10.0	1.6	0.0	1.7	7.7	0.0	0.0	5.0	0.0	1.4
Other (specify)	13.1	6.9	20.0	7.8	21.1	21.4	23.1	26.9	8.3	15.0	23.9	16.6
N (number of cases reporting group membership)	160	29	10	64	57	117	13	26	12	20	46	277
Any participation (group and/or training)	15.1	51.7	3.5	26.1	17.6	13.1	7.4	13.7	7.7	15.5	27.6	14.1
Any training participation	5.5	6.9	2.3	11.9	4.2	8.9	5.8	8.8	6.2	9.1	17.8	7.2
Any group participation	11.4	50.0	1.7	18.2	15.0	8.2	3.6	8.2	3.5	10.7	21.5	9.8
n	1,396	58	605	352	381	1,410	364	306	339	187	214	2,806

## ABOUT THE REAL AWARD

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

