PARTNERSHIP FOR RESILIENCE AND ECONOMIC GROWTH IN NORTHERN KENYA

PREG II

IMPACT EVALUATION REPORT OF RECURRENT MONITORING SURVEY 2019–2020

JULY 2022

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Tim Frankenberger, President
TANGO International

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LIST OF ACRONYMS

ASALs	arid and semi-arid lands
DRR	Disaster Risk Reduction
EA	enumeration areas
FEWS NET	Famine Early Warning Systems Network
FFW	food for work
FG	focus group
FGD	focus group discussion
FIES	Food Insecurity Experience Scale
FTF	Feed the Future
GoK	Government of Kenya
HA	humanitarian assistance
HDDS	Household Dietary Diversity Score
HH	household
KAP	knowledge, awareness, and perceptions
KI	key informant
KII	key informant interview
NGO	non-governmental organization
NRM	natural resource management
PAYE	pay as you earn
PPE	personal protective equipment
PPS	probability-proportional-to-size
PREG	Partnership for Economic Growth
REGAL	Resilience and Economic Growth in Arid Lands
RMS	recurrent monitoring survey
TANGO	Technical Assistance to Non-Governmental Organizations
TLU	tropical livestock unit
USAID	United States Agency for International Development
VAT	Value Added Tax
WFP	World Food Programme

EXECUTIVE SUMMARY

Kenya's arid and semi-arid lands (ASAL) region has been adversely impacted by a legacy of drought emergencies, human conflict, marginalization by the government, and poverty. USAID's Partnership for Resilience and Economic Growth (PREG) initiative brings together multiple humanitarian and development partners who work with the Kenya National Drought Management Authority and county governments to coordinate resilience and economic growth activities to strengthen resilience among vulnerable pastoralist communities in nine of Kenya's 23 ASAL counties. The PREG model of collaboration enables partners to minimize redundancies, promote synergies, and achieve multi-partner collaboration and coordination.

As part of the impact evaluation (IE) for the PREG II initiative, this report documents the analysis of data from the first year of the Recurrent Monitoring Survey (RMS) in nine ASAL counties. The objective of the RMS is to provide real-time data on household resilience capacity during the course of—or in the immediate aftermath of—an actual shock with the goals of understanding the nature of the shock, how households are coping with shocks, and the degree of their resilience to the effects of shocks.

Study Design / Methods

The RMS uses a mixed-methods design that includes both a quantitative and qualitative component. The RMS sample is a subset of households surveyed at baseline (i.e., a panel survey) involving a total of 838 eligible households across the nine counties. The sample size remained relatively stable over the data collection rounds, ranging from approximately 720 to 750 households, depending on the round.

RMS data was collected in four rounds over a period of approximately 10 months: September 2019, Nov/Dec 2019, March/April 2020, and June 2020. Round 4 (June 2020) took place in the context of COVID-19, and data collection shifted from face-to-face to phone-based interviews. The RMS survey instrument and qualitative tools were adapted to accommodate the phone-based modality and to incorporate questions related to COVID-19.

Based on the baseline survey design, the RMS sample was stratified into treatment (high-intensity) and control (low-intensity) groups in a two-stage selection process. The sampling frame for the treatment group comprised all sub-locations within the five high-intensity counties in which USAID-funded project activities by PREG II implementing partners were reported to have occurred (Isiolo, Marsabit, Garissa, Wajir, and Turkana counties). The sampling frame for the control group comprised the four sub-locations (Baringo, Mandera, Samburu, and Tana River Counties) where WFP and/or other USAID programming activities had taken place, particularly education, natural resource management (NRM), and health/nutrition interventions. At the time of IE design and as the program was beginning implementation, USAID considered that their programming in these low-intensity counties was not directly focused on addressing multiple dimensions of resilience.

Measuring the three dimensions of resilience capacity (absorptive, adaptive, and transformative) requires the use of factor analysis to combine multiple indicators into three resilience capacity indices and an overall index of resilience capacity.[1] The RMS survey collected information about several key resilience capacity indicators[2] over each round: asset indicators (livestock assets measured in Tropical Livestock Units (TLU) and the total number of different types of assets owned by the household), social capital (assistance received from others and assistance provided to others), and humanitarian assistance received.

The regression models used in this analysis examine the relationships of these baseline and current resilience capacities on several resilience-outcome indicators: household food insecurity levels, changes in realized resilience (round-to-round changes in household food security levels), and perceived resilience (reported ability to cope with future shocks). These models also include shock exposure and participation in resilience programming as key explanatory variables. Shock exposure is expected to increase food insecurity and reduce perceived resilience.

Key Findings

The Recurrent Monitoring System (RMS) of the PREG II Impact Evaluation provides information from a subsample of households in the baseline survey in terms of the different types of shocks they are exposed to, how they coped with those shocks, their food security outcomes, whether they perceived themselves as able to recover from future shocks, and selected key resilience capacity components. Finally, the RMS includes findings from multivariate regression analyses to estimate the contribution of participating in resilience-strengthening interventions and specific household resilience characteristics to households' resilience outcomes[3] (recovery and food security status).

Impacts of COVID-19

Overall awareness of COVID-19 is high among sampled households, although some groups have lower awareness: the elderly, children, people who migrate to remote areas, the illiterate, and people with cognitive impairments. The main sources of information about COVID-19 are family and friends and from radio and television. Although adherence to COVID-19 restrictions was generally high, youth and elderly people are perceived as less likely to comply with restrictions.

The impacts of COVID-19 were numerous and widely felt. The most commonly reported negative impacts on households from COVID-19 restrictions were: food price increases, lack of access to food and livestock markets, reduction in income, and increased transport costs. The most common coping strategies adopted were reducing food consumption, accessing food through credit, and reducing household expenses. Approximately one-third of interviewed households reported selling livestock to meet household needs.

[1] These data were collected in the baseline survey. The baseline values used in this analysis are those from August 2018, that is, 12 months before the start of RMS 2019–20.
[2] Calculation of resilience indicators are located at https://www.fsnnetwork.org/sites/default/files/Methodology_Guide_Nov2018508.pdf.
[3] Resilience is measured here as the ability of a household to maintain food security in the face of shocks.

Households report they needed continuing support to cope with COVID-19; over one-half of respondents reported needing PPE, particularly masks, soap, and wash stations. Over one-half of households also indicated they needed food assistance and one-third reported they needed access to health care.

Trends in Resilience Indicators

The overall level of shock exposure reported by households increased in the 2019/20 RMS rounds compared with the 2018 baseline. Households were exposed to a sequence of different shocks over the course of the RMS rounds:

- Variable rain/drought (September 2019)
- Excessive rains/flooding (Nov/Dec 2019)
- Crop pests (March/April 2020)
- Economic shocks associated with responses to COVID-19 (e.g., increases in the prices of food and inputs, unemployment for youth) (June 2020)

The use of coping strategies increased between the baseline and the first round of the RMS as well as over the course of the remaining RMS rounds, suggesting an increase in exposure to shocks and/or a lack of recovery or worsening conditions over time. For the most part, people relied on the same coping strategies across all rounds of data collection. However, fewer households were relying on "outside" help (e.g., receipt of emergency food aid, gifts of money/food from family and friends, migration of some family members, and sending children to stay with others) after Round 2. The dip in the use of these coping strategies coincides with an increase in the use of several negative food coping strategies, such as reducing food consumption and household expenses, as well as purchasing food on credit, all of which increased between the baseline and Round 1 and remained high or continued to increase through Round 4. Taken together, this suggests a possible weakening of informal safety nets; considering the drought and subsequent pandemic, people were essentially "tapped out" and simply had too little—or nothing—left to gift.

Focus groups (FGs) and key informants (KIs) indicated that households engaged in various kinds of collective action coping strategies, including self-help savings groups and collective management of rangeland and water resources. Focus groups also mentioned migration in search of grazing land, water, and employment opportunities.

Perhaps not surprisingly, household recovery from shocks was generally low over all RMS rounds. However, the recall period between rounds was so short (three months) that some shocks are ongoing and make a recovery unlikely. In contrast, households experiencing shocks of short duration, such as floods, are more likely to show recovery over time.

Key components of resilience capacities that increased between the baseline and the first round of the RMS as well as over the RMS period include the household assets index and utilization of social capital generally. In contrast, receipt of formal assistance declined in Rounds 3 and 4. The

overall count of different types of livestock assets increased slightly across rounds, although the number of some livestock, especially goats, decreased.

Household confidence in their ability to adapt to future shocks was low throughout the RMS period, but by Round 4, COVID-19 had negatively impacted people's confidence. FGs and KIs indicated that confidence to adapt to shocks is very dependent on community- and system-level investments in transport and water sources.

Overall, food insecurity increased substantially compared to the baseline and continued to increase over the four RMS rounds.

Resilience Programming Participation, Capacities, and Outcomes

Higher levels of household absorptive and adaptive capacities at baseline are associated with better food security at all RMS rounds, although the magnitude of this relationship is quite small. In part, the weak relationship may be explained by the long interval between the baseline and the RMS rounds (i.e., one to nearly two years, depending on the round). The use of more contemporaneous measures of resilience capacities may result in a stronger positive relationship with food security. That is, resilience capacities are expected to improve as a result of resilience programming, and measures of household resilience capacities at each RMS round may better reflect the strength of a positive relationship.

Two explanatory variables that demonstrate larger effects on food security are cumulative exposure to shocks experienced by households during the RMS period and levels of total assets. Cumulative shock exposure increases household food insecurity in each RMS round and negatively impacts their ability to reduce food insecurity across the RMS rounds. The ability of households to maintain or improve food security in the face of shocks (i.e., their resilience) is strongly and negatively affected by the number and severity of shocks to which they are exposed. Current levels of household assets are strongly associated with better food security and the ability to improve food security across RMS rounds.

Baseline resilience capacities (absorptive, adaptive, transformative, and overall) are all strongly and positively related to households' perceived ability to cope with future shocks over all RMS rounds. These results suggest that enhanced resilience capacities have a long-term positive impact on households' perceived ability to recover from shocks. However, cumulative shock exposure did not affect households' perceptions of their ability to cope with future shocks.

Despite a particularly severe set of shocks experienced by households and a corresponding downward trend in food security outcomes during the RMS period, participation in resilience programming activities enhances food security through increases in resilience capacity, in particular through an increase in assets.

Conclusions

Impacts of COVID-19

Additional questions were added to both the qualitative and quantitative components of the fourth RMS round to obtain information about households' awareness of COVID-19, the impacts of restrictions imposed to control the spread of the virus, strategies adopted by households, and the need for additional support. Although awareness of COVID-19 was generally high among most respondents, the elderly, children, illiterate people, and other isolated groups tended to have lower levels of awareness. The most common impacts of restrictions to control the spread of the virus were increased prices of food, lack of access to food and livestock markets, and loss of income. Households responded to the restrictions most commonly by reducing food consumption, getting food on credit, and reducing household expenses generally. One-third of surveyed households reported selling livestock to meet their needs during the time of the COVID-19 restrictions. Households reported ongoing need for personal protective equipment, food assistance, and better access to health care.

Trends in Resilience Indicators

During the RMS period, households were exposed to a sequence of different shocks: first, drought, then flooding, then crop pests, and finally COVID-19 in the last RMS round. In the face of ongoing exposure to these different shocks, households adopted a wide range of coping strategies, significantly more than were adopted at the baseline. Reported recovery from shocks was low over all four RMS rounds, likely due to continuing exposure to shocks, and the percentage of households reporting food insecurity increased over RMS rounds.

Resilience Programming Participation, Capacities, and Outcomes

Findings from multiple regression analyses demonstrate that resilience programming enhances food security and recovery from shocks indirectly by enhancing the resilience capacities of households, in particular household assets. Participation in resilience programming is strongly correlated with increases in household assets, which in turn is positively correlated with current household food security and the ability to recover food security levels in the face of shocks. In the face of a sequence of particularly severe shocks and stresses, participation in programming had a strong, positive effect with respect to increases in assets and, in turn, food security. In addition, the analysis indicates that more intense participation in programming, both in terms of duration and number or types of interventions, is associated with higher levels of assets and improved food security in the face of extreme and persistent shock and stress.

Better resilience outcomes are strongly associated with current resilience capacities (particularly assets) but less strongly associated with lagged levels of resilience capacities. In particular, baseline values of resilience capacities are only weakly associated with better resilience outcomes in the RMS rounds. Results from the analysis of household resilience capacities at each RMS round suggest that resilience capacities can change over time, which suggests that measures of current resilience capacity may show a stronger positive relationship with resilience outcomes. Such findings highlight the need to support transformative capacities and household strategies for

rebuilding household-level resilience capacities that may have been depleted in response to continuing or recurring exposure to shocks.

There is a positive relationship between resilience capacities (measured at baseline) and households' reported ability to recover from future shocks. This suggests that households that attain higher levels of resilience capacity have a greater sense of agency in their own futures. However, the direction of causality in this relationship is unclear—do households with more resilience capacity then have a greater sense of agency, or are households with a greater sense of agency more likely to have better resilience capacity? This is a question for further research.

Recommendations for Future PREG II Resilience Surveys

Several recommendations have emerged from this RMS analysis on how to improve future resilience surveys conducted as part of the PREG II coordination and learning platform. First, the sampling design of the mid-term and follow-up surveys of the impact evaluation study will need to be reviewed and updated. One important finding from the RMS is that project implementation of, and household participation in resilience-enhancing activities under the PREG partnership has not been clearly delineated geographically across the high- and low-intensity counties as initially defined by PREG. Using information from the RMS survey responses, project direct participants and non-participants can be distinguished, but beneficiaries of systems-level interventions such as support to local government services and value chains were not identified from questions directed to households. A revision of the sampling strategy for the PREG II mid-term survey should be undertaken to ensure that the sample adequately incorporates direct participants, indirect beneficiaries, and non-beneficiaries in order to measure adequately the impacts of all types of resilience programming interventions. This will require further consultation with PREG implementing partners to understand better the geographic scope of their systems-level interventions. The strategy used to classify beneficiaries will need to be modified to ensure that indirect beneficiaries of systems-level interventions are identified in the sample.

Second, the next round of RMS should be initiated immediately after the implementation of the mid-term survey, scheduled to take place in September 2021. This way, the resilience capacities measured in the mid-term survey, which will be a full survey akin to the baseline that captures information about the full range of resilience capacities, will be more closely aligned with the responses to shocks measured in the RMS.

We also recommend exploring in more detail the relationships between participation and socio-economic characteristics of households in later rounds of the evaluation. In particular, whether wealthier households are more likely to participate in program activities or whether participation is driving higher wealth, particularly assets, for those households that do participate. Findings from this RMS study suggest there is a strong relationship between participation and assets, and this relationship merits further exploration.

Another recommendation is to collect more detailed participation information during the second wave of the RMS following the mid-term survey in 2022. The questions designed to capture participation information should be crafted in coordination with the PREG team to capture

information regarding important interventions being implemented through the PREG II partnership that 1) household participants will be able to identify, and 2) the information should include the specific points in time the household is participating in the intervention.

Finally, the RMS survey should be designed to track changes in more resilience capacities, including access to information, access to shock preparedness and mitigation support, and changes in key transformative capacity components, i.e., access to different kinds of services. These are all critical resilience capacity components that may change within the time frame of an RMS study.

1 INTRODUCTION

As part of the impact evaluation (IE) of the Partnership for Economic Growth (PREG) II coordination and learning platform, this report documents the analysis of data from the first year of the Recurrent Monitoring Survey (RMS). The impact evaluation measures the impact of activities implemented under the PREG II partnership on household resilience and well-being outcomes in the face of shocks and stressors.

The overall objective of this impact evaluation is to provide insight into the extent to which a package of layered, sequenced, and integrated PREG II partnership activities improves key household resilience outcomes and strengthens resilience capacities of food insecure and vulnerable households in nine of the Northern Kenya arid and semi-arid lands (ASALs) counties. Resilience and resilience capacity are defined in the box below.

What are resilience and resilience capacities?

The PREG IE conceptualizes **resilience** according to the United States Agency for International Development (USAID) definition: "[Resilience is] the ability of people, households, communities, countries, and systems to mitigate, adapt to, and recover from shocks and stresses in a manner that reduces chronic vulnerability and facilitates inclusive growth." According to this definition, household resilience is the ability of a household to mitigate, adapt to, and recover from shocks and stresses.

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

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

The objective of the RMS is to provide real-time data on household resilience capacity during the course of—or in the immediate aftermath of—an actual shock with the goals of understanding the nature of the shock, how households are coping, and the degree of their resilience to it (Scantlan and Sagara 2019). Using both quantitative and qualitative data, this RMS analysis focuses on a 12-month period with varying degrees of shock exposure over time to inform the timing of early action/response by PREG partners. For the PREG IE, two RMS surveys are planned, each consisting of four rounds that will occur every three months over a 12-month period. The initiation of the first RMS (RMS-1) was timed to capture the effects of the severe drought affecting northern Kenya in 2019.

Households surveyed in the RMS were drawn from the PREG II baseline survey sample. This sample design allows for the utilization of data on baseline household characteristics, including resilience capacity measures, collected before the worsening drought conditions experienced in northern Kenya in the year before the RMS.

1.1 THE PREG II PROGRAM

Overview

Following prolonged and severe droughts in northern Kenya in 2008 and 2011, the USAID Feed the Future (FTF) initiative began to address pastoralist vulnerability and resilience in the ASALs of northern Kenya through two five-year projects under the Resilience and Economic Growth in Arid Lands (REGAL) program. In partnership with World Food Programme (WFP), and the Government of Kenya (GoK), this effort introduced the "9-5-2" strategy[4] of layering, sequencing, and integrating activities in the ASALs, and coordinating and harmonizing USAID-funded resilience-building activities of humanitarian and development stakeholders. In 2014, this partnership expanded to include over 15 partners from USAID, GoK, WFP, and other implementing partners, forming the PREG collaboration and learning platform (i.e., the Partnership).

> "Through collaborative activities and approaches in the ASAL areas of Kenya, USAID PREG partners will more effectively support the Government of Kenya to develop individuals', communities', and systems' resilience capacities resulting in sustainable reductions in humanitarian assistance needs, prevalence/depth of poverty, household hunger, and acute/chronic undernutrition."
>
> *– PREG Vision Statement*

Currently, the Partnership brings together humanitarian and development partners and the GoK at national and county levels in nine of the 23 ASAL counties to strengthen resilience and address underlying vulnerabilities in the region. The PREG model of collaboration has enabled partners to minimize redundancies, promote synergies, and achieve multi-partner collaboration and coordination.

Program Background

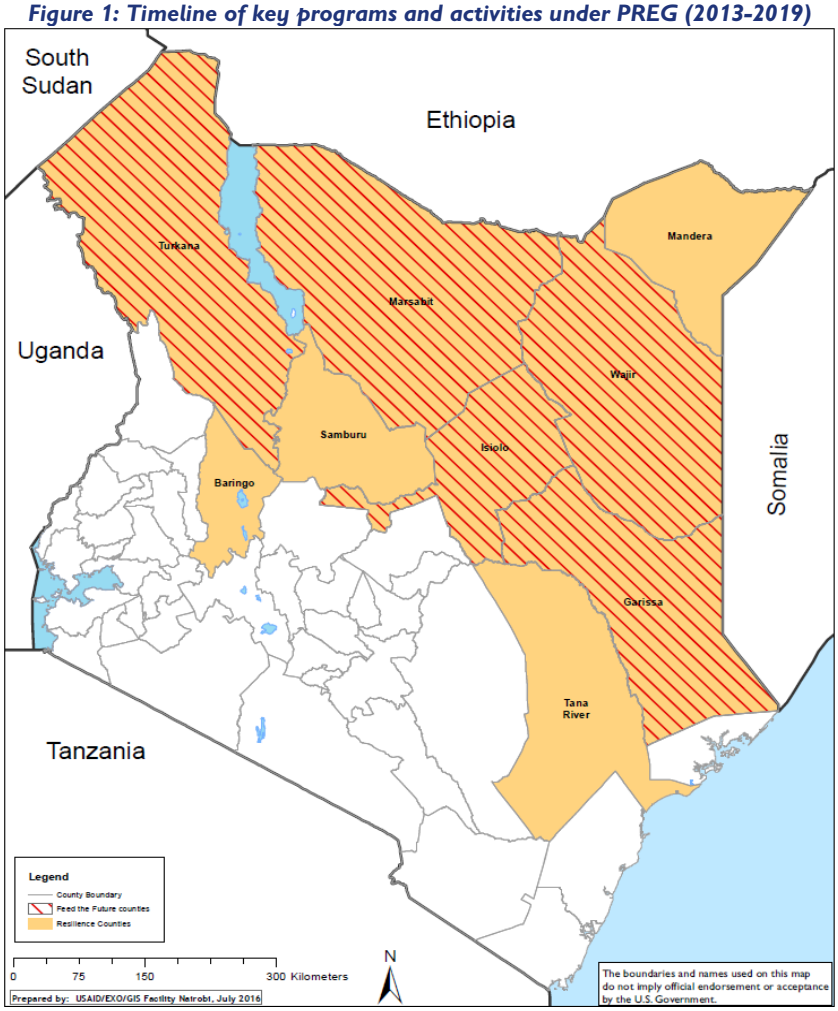
PREG II is the second 5-year phase of the USAID-funded PREG initiative in northern Kenya. It has three interrelated objectives: increasing household incomes, enhancing resilience, and bolstering adaptive capacity to climate change among vulnerable pastoral people in northern Kenya. PREG II targets nine counties in the ASALS of northern Kenya: Baringo, Garissa, Isiolo, Mandera, Marsabit, Samburu, Tana River, Turkana, and Wajir (Figure 1). Within these nine counties, PREG identifies five as "high-intensity": (Garissa, Isiolo, Marsabit, Turkana, and Wajir), where more-intensive resilience-focused development programming is targeted. The remaining four "low-intensity" counties (Baringo, Mandera, Samburu,[5] and Tana River) benefit from humanitarian assistance support and programming less directly related to strengthening household resilience

[4] "9-5-2": nine counties receiving humanitarian aid: five with resilience-building activities and two with additional market-oriented activities.
[5] Under BHA's new investment, NAWIRI, Samburu County is now classified as "high-intensity."

capacity (including environmental programming, support for health services, and support to education).

The partnership seeks to generate the economic growth needed to reduce poverty and hunger and to achieve the GoK's vision of a commercial and modern agricultural sector by investing in agriculture and livestock production to improve the competitiveness of high-potential value chains and promote diversification into higher-return on- and off-farm activities in the five high-intensity counties. In the four low-intensity counties, Resilience support under the PREG II partnership umbrella is limited to humanitarian assistance in the face of shocks.

Figure 1: Timeline of key programs and activities under PREG (2013-2019)



1.2 ORGANIZATION AND RESEARCH QUESTIONS

The objectives of this report are to 1) understand the severity and evolution of the shocks households faced over the RMS period; 2) document the coping strategies they used to deal with them; 3) explore how households' resilience capacities have affected their resilience/food security outcomes to date; and 4) explore how resilience programming has affected their resilience/food security outcomes to date. To address the first and second objectives, descriptive information collected over the course of the RMS is provided for the following themes:

1. Patterns of shock exposure reported by households, by round;
2. Coping strategies adopted by households;
3. Changes in food security status and recovery from shocks of households; and
4. Changes in key resilience capacities (e.g., assets, social capital, absence of fatalism, access to humanitarian assistance

The COVID-19 pandemic hit the RMS survey area between Rounds 3 and 4. The fourth-round survey was modified to capture information about the impacts of COVID-19 on the surveyed households. Additional research questions included:

5. What knowledge do surveyed households have about COVID-19 and how did they obtain relevant information?
6. To what extent have surveyed households complied with protocols and restrictions implemented to mitigate the spread of the coronavirus?
7. What have been the impacts of COVID-19 and the associated restrictions imposed on surveyed households?

To address the third and fourth objectives of the report results from the in-depth analysis will be presented to address the following research questions:

1. How did the severity of exposure to shocks affect households' food security status and ability to recover?
2. To what degree have households' baseline capacities helped them recover from shocks they experienced over the RMS period?
3. How did key resilience capacity components (assets and social capital) change over the RMS period and how were these components associated with food security and recovery from shocks?
4. How did participation in resilience programming affect food security, recovery from past shocks (short-term realized resilience), and perceived resilience to future shocks?

1.3 ORGANIZATION OF THE REPORT

Section 2 presents the data collection and analysis methodologies employed for the RMS. Section 3 presents quantitative and qualitative descriptive findings on various themes, and Section 4 presents the findings specific to a COVID-19 module that was added in the fourth survey round. Section 5 examines the relationships between food security, resilience capacity, and participation in development program activities. The report concludes in Section 6 with a summary and high-level conclusions.

2 METHODOLOGY

2.1 QUANTITATIVE DATA COLLECTION AND ANALYSIS

Quantitative Data Collection

The RMS follows a baseline survey conducted by TANGO International and Kimetrica in September 2018 from which the RMS sample of panel households was selected. TANGO and Kimetrica collected RMS data in four rounds over a period of approximately 10 months, from September 2019 to June 2020. Round 4 (June 2020) took place in the context of COVID-19 and data collection thus shifted from face-to-face interviews to phone-based interviews.

Sampling Design

The RMS sample is a subset of households surveyed at baseline. This sampling strategy provides for the full set of information about households, including their resilience capacities from the baseline survey, to be incorporated in the analysis of the RMS sample. The RMS quantitative survey questionnaires are found in Appendix 1, including a new module added in Round 4, when questions on COVID-19 were added to quantitative and qualitative data collection tools.

Baseline

Data collection for the baseline survey was based on a quasi-experimental mixed-methods design and followed a two-stage, stratified random sampling design. In Stage One, sublocations[6] were selected using probability-proportional-to-size (PPS) technique. The Kenya National Bureau of Statistics provided TANGO with census enumeration areas (EAs) for each sublocation. From that, Kimetrica conducted a household listing exercise and sample households were randomly selected from that list. The household and community surveys are designed to generate data that allows us to examine the impacts at endline of exposure to and participation in PREG II partner interventions on resilience capacity and well-being outcomes in the face of shocks.

The baseline sampling strategy involved stratifying the sample under the assumption that there were identifiable "high" and "low" intensity strata,[7] (i.e., high and low exposure to activities conducted through the PREG II partnership). At baseline, low-intensity households were selected from sublocations in Baringo, Mandera, Samburu, and Tana River Counties where WFP and/or other USAID programming activities had taken place, particularly, education, natural resource management (NRM), and health/nutrition interventions. At the time of IE design and as the program was beginning implementation, USAID considered that their programming in these counties was not directly focused on addressing multiple dimensions of resilience.[8] Households

[6] Sublocation is an administrative boundary defined by the Kenya National Bureau of Statistics and is used as part of their census. Sublocations are smaller than locations, which roughly align with electoral wards, and are larger than villages or communities.
[7] It is possible that communities and households sampled for the PREG II IE were exposed to other non-USAID funded activities, as described in the limitations.
[8] It should be noted that the PREG I IE endline and PREG II IE baseline were conducted as a combined M&E activity (i.e., quantitative survey and qualitative fieldwork). This constrained the geographic area for the combined fieldwork for PREG II into areas consistent with the

were selected from high-intensity sublocations in Isiolo, Marsabit, Garissa, Wajir, and Turkana counties. USAID programming in the high-intensity counties is explicitly designed to strengthen multiple dimensions of resilience capacity through a comprehensive resilience programming strategy. The flagship resilience program implemented in the high-intensity counties is Livestock Market Systems.

Using the baseline dataset as a frame to draw the RMS study sample, the RMS sample was drawn in two stages. In the first stage, the number of EAs per county were selected to match the distribution of households surveyed in the baseline (Table 1) as closely as possible.[9] For the second stage, all households interviewed at baseline in the selected EAs were eligible for the RMS study. In total, 838 households across the nine counties were eligible for the RMS study and ultimately, 735 households were located using contact information collected as part of the baseline survey and surveyed in the first round (R1) of the RMS. The sample size remained relatively stable over the remaining three rounds (Table 2).

Table 1: Clusters selected in baseline and RMS, by county

	RMS		Baseline	
County	**# HH**	**% In total RMS sample**	**# HH**	**% In total baseline sample**
Baringo	29	4%	58	2%
Garissa	95	13%	341	12%
Isiolo	41	6%	188	7%
Mandera	152	21%	608	22%
Marsabit	57	8%	216	8%
Samburu	102	14%	354	13%
Tana River	97	13%	382	14%
Turkana	92	13%	364	13%
Wajir	70	10%	309	11%
TOTAL	**735**	**100%**	**2820**	**100%**

Table 2: Sample size, by survey round

	# Surveyed households*	Time of survey
Round 1	735	Sept 2019
Round 2	719	Nov/Dec 2019
Round 3	748	Mar/Apr 2020
Round 4	730	June 2020

* # households selected from baseline: 838

definition of high-intensity and low-intensity as part of the PREG I program. With the best information available at the time of survey design, the low-intensity and high-intensity areas for PREG II were expected to align with the same respective PREG I areas.

[9] EAs with particularly high non-response in the baseline (EAs with < 22 of 30 eligible households surveyed in the high-intensity group and < 25 in the low-intensity group) were excluded from the RMS sample frame for logistics purposes, representing 17 percent of total EAs sampled and 12 percent of households surveyed at baseline. There were no significant differences between means/proportions of baseline values of drought incidence, resilience capacity indexes, assets, or education of the household head between those EAs that remained in the sample and those that were excluded.

Measuring Project Participation

As indicated above, the baseline sample was stratified into treatment (high-intensity) and control (low-intensity) groups in a two-stage selection process. The sampling frame for the treatment sample comprised all sub-locations within the five high-intensity counties in which USAID-funded project activities by PREG II implementing partners were reported to have occurred. From this frame, 102 sublocations were selected randomly using PPS. Within each selected sub-location, a single enumeration area was selected and then 30 sample households were selected from a listing of all resident households within the EA. In principle, sampled households in these treatment sub-locations where interventions have taken place fall into one of three categories:

- **Direct participants:** Households that report they participated in a project group or training;
- **Indirect beneficiaries:** Households that did not report participating in a group or training, but who benefitted indirectly through others' engagement in groups or trainings OR they benefitted from systems-level interventions that "trickle down" (e.g., support to value chains, Disaster Risk Reduction (DRR) committees, or to local government or community-level organizations that provide support to community members, etc.); and
- **Non-beneficiaries:** Households that did not report participating in a group or training and there is nothing to suggest that they experienced any direct or indirect effect of others' engagement in groups or trainings (e.g., they received no early warning as part of a DRR plan). Typically, this group comprises the "control" group of households.

The RMS questionnaire provides information about households' participation in trainings or membership in groups that support resilience-building activities. This information can be used to identify the direct participant households within the treatment group. However, the survey data do not permit categorization of non-direct participants into indirect beneficiaries or non-beneficiaries. Therefore, the measure of participation we use for this study is focused on self-reported, direct participation in interventions and does not necessarily capture exposure to system-level interventions (see Limitations, p. 12).

The sampling frame for the low-intensity group included all sub-locations within the four low-intensity counties that were included in the PREG partnership database of activities (i.e., sublocations within the low-intensity counties where partnership activities were reported by the implementing partners). All sub-locations in low-intensity counties were assumed to not have any exposure to development-oriented resilience programming; instead, they might have only received humanitarian assistance, health support, education, or environment/NRM interventions.

One important finding from the RMS is that project participation in PREG partnership resilience-enhancing activities has not been cleanly delineated geographically across the high- and low-intensity counties as defined by PREG. As can be seen in Table 3, the percentage of households who participated directly in any type of resilience-strengthening training or group ("treatment") at any time during the RMS was only slightly higher than in the "control" group. Based on these results, a comparison of findings across the geographically defined treatment and control groups (i.e., high/low

intensity of programming) will not provide clear conclusions regarding the impacts of participation in resilience programming on the outcomes of households surveyed as part of the RMS.

Table 3: Reported participation rate, by treatment (high-intensity) and control (low-intensity) groups, across all RMS rounds

	Participation in at least one group / training at any RMS round		
	% Households	n(observations)	n(households)
Control	36	1567	419
Treatment	42	1365	375
Total sample	**37**	**2932**	**794**

Given this limitation, the findings starting in Section 3 of this report are broken down into **participant and non-participant groups** based on responses regarding participation in training and membership in groups that are engaged in activities to strengthen their resilience capacities.[10] Comparisons are between self-reported direct participants and non-participants only; survey data do not allow for the identification of indirect beneficiaries of resilience programming.

Table 4 shows the percentage of sample households who reported participation in at least one group or training activity in each round of the RMS. Participation was low across rounds and declined slightly by Round 4. Mobility restrictions and slow rollout due to COVID-19 containment measures may have impacted participation in Round 4. Overall participation was driven by participation in groups, which was consistently higher compared to participation in trainings, suggesting that engagement in groups may have been a prerequisite or at least a precursor to receiving training. The average number of activities households participated in was 1.5, though it also declined slightly over survey rounds.

Table 4: Household participation, by survey round

	Sept 2019	Nov/Dec 2019	Mar/Apr 2020	June 2020
Participation (% HH)				
High Intensity (Treatment)	26	23	27	19
Low Intensity (Control)	19	19	17	13
Program participation in previous three months (% HH)				
Participated in groups	20	20	20	16
Participated in trainings	7	7	8	4
Any participation	23	22	22	17
Mean number of activities for those that participated				
Number of groups	1.4	1.2	1.1	1.1
Number of trainings	1.7	1.2	1.3	1.6
Number of groups and trainings	1.8	1.5	1.5	1.5
n (households)	735	719	748	730

[10] Includes both PREG and non-PREG resilience-strengthening trainings or groups.

COVID-19 Restrictions

Following the first confirmed case of COVID-19 in Kenya on March 13, 2020, President Kenyatta issued several directives and protocols to curb the spread of the virus.[11] These included the suspension of entry into the country; self-quarantine for individuals who entered the country recently; suspension of learning in all institutions, including schools and universities; social distancing in businesses, hospitals and markets; and a work-from-home order.

Prior to these directives, Kimetrica, in partnership with TANGO International, had conducted three survey rounds of the RMS. A fourth round was scheduled for May 2020 but was delayed in light of the pandemic. To safeguard the health and safety of data collection teams and communities, and to gain insights into the effects of COVID-19 on households, TANGO proposed to shift the fourth round of data collection from face-to-face to phone-based interviews. Following agreement of the USAID Mission in Kenya on remote data collection, TANGO and Kimetrica began to adapt the instruments and protocols.

Feasibility assessments for a phone survey and local permission were done prior to Round 4. The RMS survey instrument and key informant interview (KII) topical guide were adapted to accommodate the phone-based modality and to incorporate questions related to COVID-19. There was a very low rate of attrition (730 households (HH) / 748 HH <3%) between the third round of the RMS that was conducted using face-to-face interviewing and the fourth round that was conducted using mobile phones.

INSTRUMENT ADAPTATIONS

The following adaptations were made to the quantitative survey:

- Revised the consent statement and procedures.
- Revised the interview completion status to phone-based mode (e.g., replaced response categories with phone closed, no network, number not in use, wrong number).
- Reworded and eliminated some questions.
- Added COVID-specific responses to questions.

Quantitative Data Analysis

The quantitative data cleaning and analysis were conducted with the statistical software Stata using both descriptive and multivariate analysis techniques.

[11] See for example, the president's March 15, 2020 press briefing: link to recorded briefing.

Descriptive Analysis

Descriptive findings include univariate and bivariate measures that describe trends in households' shock exposure, coping strategies, food security, recovery, and selected resilience capacity components across the RMS rounds. Results for indicators disaggregated by households that participated in groups and/or trainings and those that did not in cases are presented where meaningful differences are observed between these two groups (i.e., cases where there was little observed difference when this might have been expected otherwise). Differences are considered statistically significant at the 0.1 level or lower. Indicator values for sample sizes less than 30 are not reported.

Multivariate Regression Analysis

The multivariate analysis estimates the contribution of specific household resilience characteristics to households' resilience outcomes (recovery and food security status). The analysis uses panel data in which each household has data for all five rounds—the first record from the baseline survey, and four additional records from successive RMS rounds. Panel data allow for measurement of change over time at the household level: researchers can test hypotheses about the effects of conditions and interventions in one time period on outcomes later on. Panel datasets are in contrast to cross-sectional datasets, where data are collected at one point in time. As panel data are collected over a series of time periods, the sample size increases from the total of all households in the initial round to the total of all households over all rounds (because data across all rounds are treated as separate observations). Larger samples improve the ability to detect small changes in outcomes; they also minimize problems like multi-collinearity.

The multivariate regression analysis addresses the following questions:

1. How do the severity and duration of exposure to the shock affect households' ability to recover from it?
2. Do higher levels of resilience capacities before the onset of the shock improve households' ability to recover and does the relationship vary by shock type?

2.2 QUALITATIVE DATA COLLECTION AND ANALYSIS

Quantitative Data Collection

Qualitative information is essential for situational awareness of the drivers of resilience and for a deeper understanding of the processes and interrelationships relevant to household and community resilience. Qualitative information is used to contextualize indicators employed in the study, provide an understanding of local concepts and definitions of resilience, and complement quantitative findings on significant changes with household perspectives of change.

Qualitative data were collected to determine how communities were coping with shocks, how social capital functioned in the face of shocks, and how community structures held up under shocks, with Round 4 more focused on the impacts of COVID-19 containment measures. Another

objective of the qualitative work was to determine gender-differentiated impacts of shocks and vulnerable populations. The fact that interviews were conducted over time provided a picture of the changing conditions that communities faced and how they tried to cope with them.

Qualitative interviewers conducted three rounds of in-person KIIs (R1, R3, and R4).[12] Thirty KIIs were conducted per round, with at least one, but as many as six KIIs conducted per county. KIs included village chiefs and assistant chiefs, elders, teachers, and other community leaders. Eight focus group discussions (FGDs) were conducted in Round 2 in selected sample villages in Isiolo and Tana River (two male FGs and two female FGs per county). FG attendance ranged from seven to 14 people. Interviews and FGs were conducted in the local language. The interviewers obtained verbal consent from all participants before proceeding and provided final notes in English. The topical outlines for KIIs and FGDs are in Appendix 2.

Quantitative Data Analysis

The qualitative information from the FGDs and KIIs was transferred into topically structured matrices. This information was then analyzed to identify patterns in responses and contextual information to help address the research questions and explain the quantitative findings.

Research questions guiding the qualitative data collection include:

1. What kinds of shocks and stresses are the community experiencing now? When did they start? How long do they last (e.g., days, months)? How many people are affected?
2. In what ways is the shock affecting the community (entire community, men/women, pastoralists, and youth)?
3. What actions are members of the community taking to support each other to respond to the shock?
4. How is the shock affecting relationships within the community? Relationships with other communities?
5. Are community leaders effective at organizing support for all members of the community? Why or why not?
6. What collective action is the community taking to protect or maintain resources important to the whole community? Which resources and why?
7. How does access to markets and infrastructure change in the period following a shock?
8. How effective has the county and/or national government response to shocks and stressors been?

[12] Due to COVID-19 travel restrictions, the FGDs planned for the final round were replaced by phone KIIs.

2.3 LIMITATIONS

Attribution of participation to the PREG partnership. An important caveat to interpreting respondent data is that respondents may not know or be able to accurately report who sponsored, provided or organized a given activity, or to distinguish those implemented through the PREG partnership from other similar programming. Because of this uncertainty, the instrument was not designed to attribute participation specifically to the PREG partnership. We thus cannot say with certainty whether self-reported data reflect PREG partnership activities, activities of another entity, or both.

Shock exposure index. The shock exposure index is computed based on a list of 23 possible shocks. The same list is used across survey rounds to allow for comparability of the index across rounds. The COVID-19 pandemic started in early 2020; the first survey round where it would potentially be noted was Round 3, in March/April 2020. The response options to the survey question about shocks did not change to include COVID-19 specifically, in the interest of preserving the consistency of the index. If a respondent named COVID-19 as an illness in the community or household, it may have been coded under shocks as "human disease outbreak" or "illness or death of breadwinners." However, as verified by the survey team and the qualitative data, few to no cases of COVID-19 were reported in the survey area in any round, so we would not expect COVID-19 to register as a shock in the human illness category. It is more likely that the survey would capture downstream effects of the pandemic, such as market closures and price increases. In order to capture information about the effects of COVID-19, the Round 4 survey added a module on COVID-19 specifically, and questions were also added to the key informant and focus group guides applied for the qualitative portion of the exercise.

Sampling and participation in PREG partnership activities. The initial sampling design of the baseline survey was based on the assumption that the geographic delineation of treatment and control areas by sub-location within a county—in particular, the assumption that no development-oriented resilience programming occurs in the low-intensity counties—has turned out to be incorrect. A large proportion of sampled households within the control counties have, in fact, participated—to some degree—in resilience programming. As a result, the initial analytical approach of comparing results between treatment and control groups to measure the impact of resilience programming as part of the PREG partnership is not viable. In light of this reality, the approach adopted for the analysis of the RMS data is to compare differences between households that self-report having directly participated in program interventions designed to strengthen resilience with those that have not participated in such programming. A limitation of this approach is that it cannot measure the effects of indirect benefits deriving from system-level interventions, such as supporting community-based organizations, strengthening government services, and supporting value chains and market systems. This limitation must be taken into consideration in interpreting the analyses of the impacts of resilience programming participation presented in this study.

3 DESCRIPTIVE FINDINGS: COVID-19

Effects of COVID-19 were beginning to be evident as early as Round 3. Thus, a COVID-19 survey module specifically designed to capture information about how the pandemic and protocols implemented to contain it were affecting households was added to the Round 4 survey (June 2020). Questions were also added to the qualitative instruments. This section integrates the findings from both quantitative and qualitative sources collected in Round 4.

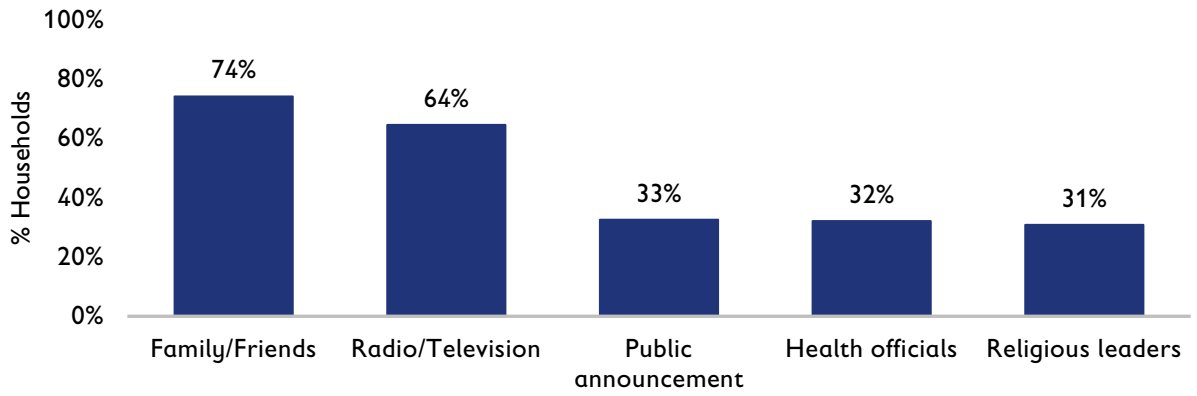
3.1 AWARENESS AND KNOWLEDGE OF COVID-19

The qualitative data indicate widespread awareness of COVID-19 symptoms and prevention measures across all counties, though certain groups were considered as less likely to be aware:

- The elderly, who tend to remain indoors or have less exposure to media (TV, radio) and social media (Facebook, WhatsApp), where information is largely disseminated;
- Young children, who cannot fully understand the virus or comply with mitigation measures;
- People migrating with livestock or residing in remote areas where the road infrastructure is poor and there is no communication network coverage; and
- People with disabilities that entail cognitive impairment and those who are non-literate and do not understand the causes and impact of the virus.

The household survey asked how households learned about COVID-19 and allowed multiple responses to capture all sources of information. As shown in Figure 2, family/friends and radio/television were by far the most common sources of information. Other important sources were public announcements, health officials, and religious leaders. These information channels are important to keep in mind in designing information campaigns around public health issues such as COVID-19. The survey data indicate that only 5 percent of households heard about COVID-19 through non-governmental organization (NGO) workers (data not graphed).

Figure 2: Sources of information about COVID-19, Round 4 (multiple response)



3.2 ADHERENCE TO PANDEMIC PROTOCOLS

KIs reported widespread adherence to COVID-19 guidance such as washing hands and social distancing. Some reported reduced attendance at social functions, such as weddings and funerals (e.g., in Isiolo) in adherence to Ministry of Health guidelines.

> "Some old men are denying the existence of coronavirus saying that it's a lie; the same group is not happy with the closure of mosques, madrassas, churches and schools...saying this disease is only for the white people."
>
> *– R4; Wajir*

Youth and the elderly were commonly identified as less likely to comply with COVID-19 protocols. Reasons for non-compliance among the elderly include low awareness and lack of masks and sanitizer. Others simply refuse to believe it is a problem, saying, *"corona is just like any other disease-like flu."* In Garissa, some do not believe it can exist in hot environments or have not seen anyone who has died from the virus. Religious leaders and people's desire to practice their faith also contribute to the resistance, as it was reported in Wajir that some religious leaders are still performing congregation prayers.

Young people were sometimes described as feeling insusceptible to the virus or simply refused—or choose not—to comply. For example, KIs in Turkana and Wajir indicated some youths ignored government directives or in the case of Wajir, played soccer without masks. In other cases, they feel an obligation to continue certain cultural practices: *"[Youths] sing and eat together in the village due to Samburu culture. Each Moran (youth) has to observe the culture so as to be deemed to be a man."*

> "Many youth, especially cowboys [who engage in herding activities] believe that the virus is for people living in towns and not them. This is because they believe that if they can stay for long periods of time with hunger, walk long distances and sometimes become ill and get healed without medication, then they have stronger immune systems than people living in towns."
>
> *– R4; Wajir*

Other reasons for non-compliance include the need to work to support one's family and lack of information, especially for people in remote areas. In particular, pastoralists are often occupied with their livestock in more remote areas, away from towns, and may not be well informed about the virus.

Enforcement by authorities has aided compliance. Police or other authorities enforce compliance with wearing facemasks in public areas (e.g., shopping centers) or when people come into town. Some people blame a lack of money to buy facemasks; others may be unaware of the mandate. In Turkana, offenders are apprehended and taken to quarantine by force, according to a KI there. In Tana River and Marsabit, *Nyumba Kumi* (peace committees), who assist local chiefs in security and community policing matters, also ensure that the rules and guidelines are adhered to.

3.3 GOVERNMENT AND COMMUNITY RESPONSE

This section summarizes national and local level measures to stop the spread of COVID-19 and their associated actors as reflected in the qualitative data.

Awareness-raising

Public awareness campaigns have taken place using public address systems (e.g., vehicle-mounted), television, radio, and social media (e.g., Facebook). The main implementers are national government, county government (e.g., county public health department), provincial administrators, the Kenya Red Cross Society, and a few local and international NGOs. Community health volunteers, village chiefs, and health center staff conduct door-to-door awareness campaigns to educate community members about COVID-19, its symptoms and signs, and measures to mitigate contracting and spreading the virus. According to one KI in Samburu, *"No public awareness activities have taken place except the spread of information about coronavirus through radio stations and what we hear from our neighbors and friends."*

Village elders and religious leaders were also named as playing a role in educating the community about the virus and government directives, such as by visiting door-to-door (e.g., in Baringo, Isiolo, Turkana, Wajir, Garissa, Samburu), and reporting suspected cases to the police. People also rely on neighbors and friends.

Personal Protective Equipment, Water/Handwashing Facilities, and Other Equipment

Across counties, the government, county health department, local political leaders, the Kenya Red Cross, and some NGOs (e.g., Girl Child Network, Turkana Basin Institute [TUBAI]) were credited with distributing various provisions for handwashing and personal protection to business owners (including *bodaboda* drivers) and community residents, including handwashing containers, jerry cans, sanitizer, soap, masks, and gloves. Handwashing stations were installed at businesses, *matatu* stages (bus stations), and markets. Some KIs reported an urban bias in the distribution of supplies, attributed in part to higher congestion in towns and cities. Others remarked that there were not enough masks for everyone (e.g., in Isiolo, Wajir, Samburu, and Mandera) or that free masks were not provided (e.g., in Tana River). Several KIs noted that vulnerable households cannot afford to purchase masks, soap, and sanitizers or that masks are not always available at local shops.

Food and Cash Assistance

Distribution of food assistance connected to the pandemic varied by county and even by village within a county. Many village KIs indicated there was no additional assistance due to the pandemic. Those providing pandemic-related food included government, NGOs, and in some cases, the private sector (e.g., Radio Ekeyokon in Turkana). Assistance was usually reserved for the most vulnerable households and in Marsabit, at least, was reported as a one-time-only distribution of a relatively small amount of food (e.g., 2 kg rice, 1 kg sugar, 2 kg maize, 3 liters oil). In Turkana, a preexisting Food for Work (FFW) program through World Food Programme/World Vision was noted as helpful but only to registered participants.

No pandemic-related cash assistance was reported by any KI, though a need for this was expressed by several KIs across counties.

HEALTH SERVICES

Several measures to improve health services in relation to the pandemic were described by KIs in Turkana and Isiolo:

- Distribution of personal protective equipment to health workers;
- Intensive cleaning of general hospital through fumigation with chlorine and "sprinkling of sanitizer everywhere within the hospital";
- Water tank installation; and
- Provision of health services by health extension workers or health professionals.

Tax and Value Added Tax Reductions

KIs in Baringo, Wajir, Mandera, Samburu, and Garissa indicated changes in the tax code were instated in response to COVID-19 hardships: the personal income tax rate was decreased from 30 to 25 percent, and people earning less than KSh 24,000 are now exempt from paying taxes, which has freed up some of their income for other purposes. A county tax exemption in Baringo was also granted to business owners and *bodaboda* drivers. However, in other counties (Isiolo, Turkana, Marsabit, and Tana River) or villages, KIs were not aware of such measures or said they did not exist. There was mention in Turkana of a possible benefit to government employees due to a reduction in Pay-as-You-Earn. KIs in Turkana and Wajir also noted a reduction in Value Added Tax (VAT) from 16 to 14 percent, though the benefit was not universally felt because food prices were still increasing.

In the private sector, Safaricom, Kenya's leading telecommunication company, eliminated fees on M-Pesa mobile banking transactions for any amount less than KSh 1,000. This was helpful in light of the promotion of cashless buying, because minimizing the use of cash can also help to reduce viral transmission.

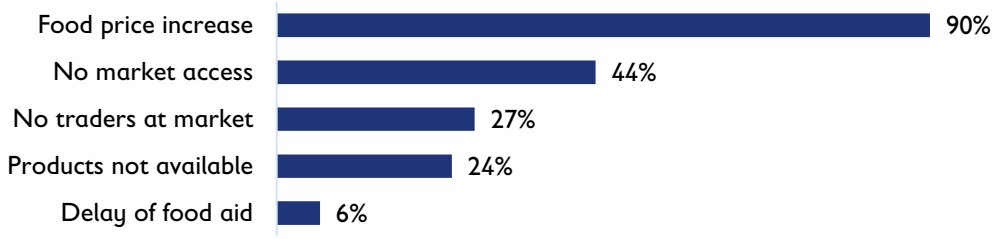
3.4 EFFECTS ON LIVELIHOODS AND FOOD ACCESS

When asked, "*Has Coronavirus affected your livelihood and/or access to food?*" 81 percent said their livelihoods were affected, and 82 percent said their access to food was affected. Food price increases affected both livelihoods (Figure 3a) and access to food for a majority of households (Figure 3b). People were also affected by a lack of access to markets, particularly livestock markets, a decrease in income, and a lack of traders and products in markets, among other effects.

Figure 3: Effects of COVID-19 on livelihoods and access to food, Round 4 (% households) (multiple response)

a) Livelihoods

b) Access to food



Markets and Employment

KIs in most counties describe a significant curtailment of market activity due to full or partial market closures, regulations on how many people may enter the marketspace, and curfews cutting regular hours of business. Some markets closed certain sections, freeing up space for social distancing. In Baringo, sales of second-hand clothing were suspended while fresh produce and honey vendors were allowed to fill those spaces. In Turkana, a KI reported significant losses for charcoal vendors due to government-mandated closure to prevent the spread of the virus. Charcoal vendors rely heavily on the charcoal market in the refugee camp as a substantial income source. Under stay-at-home orders, customers did not venture out to buy charcoal.

KIs in Baringo and Wajir spoke of the impact of business closures, such as hotels, bars, and *matatu* (minibuses). In addition, curfews are especially hard on traditional nighttime businesses and vendors such as tea vendors, *miraa* [khat] traders, *bodaboda* (motorbike) drivers, and small hotels, as well as the transport sector.

> *"Generally, all people are affected in one way or the other especially those people who were working in the hotel industry because currently they have no jobs. The government directed all hotels and bars to remain closed and only operate for minimal hours if they will comply with the set COVID-19 regulations. They are looking for some other daily casual works that can help them to pay their bills."*
>
> *– R4; Turkana*

Those who rely on casual labor are also affected because those opportunities are greatly reduced, such as masonry work, washing clothes, and work as tea vendors. The chair of a women's group in Isiolo commented, *"….most of the villagers are casual laborers, that is they work hand to mouth and with the onset of restrictions and curfew most of my fellow villagers have lost their source of income."*

Pastoralist households and others that depend heavily on livestock products and sales are strongly affected by COVID-19 measures. With cities on lockdown, city-based buyers that traders depend on can no longer come to the market or auctions and the steep rise in transport costs means livestock owners cannot afford to move their livestock to distant markets like Nairobi. In addition to livestock market closures and restrictions in Kenya, livestock trade has been heavily affected by closure of the border with Somalia.

The effects on construction work varied by county and by villages within a county. Some construction works have slowed or ceased completely due to virus mitigation measures, workers' fear of contracting the virus, and an economy crippled by the pandemic. Where work is continuing, social distancing and mask protocols were noted, at least in some cases.

Passenger Transport

Government-mandated reductions of passenger loads to ensure social distancing in public transport vehicles have led to a rise in costs to passengers; this was widely reported in Baringo, Isiolo, Samburu, and Mandera. The increase is substantial, ranging from 100 to 200 percent. The financial burden has increased dramatically on people who need to travel for medical treatment and businesses (e.g., in Tana River and Marsabit) have had to terminate their activities due to the high cost of transporting goods.

Access to Agricultural Inputs

KIs in some villages reported little to no change in access to seed and other agricultural inputs. Cargo transport was considered an essential service in some areas and thus not subject to certain pandemic-related regulations, allowing local farmers continued access to inputs from suppliers. However, some KIs in Isiolo, Mandera and Samburu specifically indicated access to inputs had decreased because of the increased costs of transport or because of pandemic-related restrictions on movement. In Turkana, it was noted that even if seed availability has not changed, farmers still cannot afford them due to less-than-normal cash flow and cash-on-hand due to the pandemic.

In Baringo, the government policy against increasing the cost of seeds and other agricultural inputs was described as very effective, with no change in prices since the pandemic. In contrast, the price of seeds, fertilizer, other agricultural inputs, and veterinary drugs was noted to have increased in Isiolo, Turkana, Wajir, Garissa, Mandera, and Samburu.

In Turkana, some farmers plant edible, rather than certified, seeds of crops such as sorghum, which is readily available in the local market with no price increase. Also in Turkana, farmers have received seeds and hoes from the World Food Programme/World Vision FFW activity.

Food Access

KIs across counties indicated that staple foods such as maize, beans, rice, pasta, and wheat flour generally remain available in markets by Round 4, but prices have increased because of higher transport costs and mobility restrictions. However, villages dependent on goods from Uganda and Somalia (e.g., in Turkana, Wajir, and Mandera) were especially affected because of border closures and in other areas food shops closed as they were unable to maintain their stocks due to the increased cost to transport foodstuffs. Of the four KIs in Turkana villages, two reported a low market supply of staples such as maize/maize flour, wheat flour, rice, and beans. According to KIs, there are no pandemic-related restrictions on cargo trucks transporting food, though lockdowns and curfews contributed to shortages of fresh fruits, vegetables, and sugar in some areas (e.g., Isiolo, Turkana, and Wajir).

> 'Currently, all [staple foods] are in the market but earlier in the month of May, beans were not available in the market because of delays caused by transport delivery issues. Some consignment came from Uganda and currently the Uganda-Kenya border is closed due to coronavirus. However, the truck drivers and their helpers have to get tested for coronavirus at the border before being allowed to proceed into the country. This process takes long and thus delays the delivery of food."
>
> *– R4; Turkana*

Cash, Food and Other Assistance

Mobility restrictions due to COVID-19 mandates have led to difficulties accessing food and cash assistance and the delay or suspension of assistance in some communities. School closures have ended access to school feeding programs. Some NGOs have downscaled their operations or closed due to COVID protocols. For example, World Vision closed their offices in some areas but plans to resume cash transfers.

There were mixed reports of delays or interruptions of government assistance. For example, KIs in Turkana stated that only seven of 152 households participating in the Hunger Safety Net Program received cash, while another village in the same county experienced no interruption. Delays in cash transfers for orphans and vulnerable households were also reported in Wajir.

Health Care Access

Although a few KIs reported no changes in health care access, access was generally described as more challenging in the COVID-19 context. Fear of contracting COVID-19 at a health care facility or hospital has deterred some people from seeking care. Congestion and long waits at public hospitals were described by several KIs as being problems before the pandemic, and the new protocols have exacerbated these challenges. For example, in Mandera, KIs reported that social distancing requirements have created long wait times for medical access. One effect has been more use of

> 'Many locals fear visiting hospital because they do not want to contract coronavirus from other patients. The locals assume that there is a probability that the hospital patients, especially those admitted, might have corona, thus hospital visits have decreased."
>
> – R4; Wajir

private health care providers, who may exploit the increased demand by increasing their consultation fees and costs of drugs.

As in other sectors, mobility restrictions and the increased cost of transportation have had a negative impact on health care access as well. Increased health care costs were described by some KIs in Isiolo, Turkana and Wajir as downstream effects of COVID-19 restrictions. As one KI stated, *"Most of the chemists and private clinics get their supplies from other towns, hence the increased transportation costs have led to an increase in the cost of services."* Certain services or medications formerly provided for free in government hospitals were now on a fee basis in some places, and the cost of laboratory tests has gone up due to short supply.

In Samburu and Garissa, KIs noted that a lack of facemasks is preventing medical access and treatment. In Dadaab, health centers require patients to get a COVID-19 test in order to be treated, further reducing access to health care for those who cannot afford to pay for tests.

> 'People have to adhere to the set guidelines requiring them to wear masks and wash hands with soap before entering the hospitals. There are many people that cannot get the masks hence are not allowed into the facility. As a result, they go back home without being treated."
>
> – R4; Samburu

In Garissa, Tana River, Mandera, and Samburu, KIs stated that most people were adhering to COVID-19 prevention guidelines and that there were no known cases in many communities. According to some, adherence to COVID-19 guidelines has led to a higher standard of hygiene and less illness. While the economic impacts of COVID-19 prevention measures have been severe, the health impact appears to have been positive, in that few cases were reported in the counties surveyed.

Mobility

The main restriction described as affecting mobility within villages was a countrywide curfew (7 p.m. to 5 a.m.) mentioned specifically by KIs in Isiolo, Turkana, Wajir, Garissa, Mandera, Samburu, and Marsabit. Others noted that people were permitted to move freely if wearing masks and observing social distancing guidelines. Still, other KIs described restrictions on entering (or re-entering) a county from a county with COVID-19 cases, such as those who had traveled to Nairobi or other cities/towns to trade, make purchases, or access services.

Travel restrictions varied from none to very strict across and within counties. In Baringo, a KI stated that those people *"…were required by the government "to self-quarantine for 14 days in their homes under supervision of chiefs who work with local village elders to monitor them."* In Marsabit, *Nyumba Kumi* committees monitor people moving in and out of villages and community members avoid interaction with visitors or people who travel frequently and ensure that they self-quarantine. In some areas, it was reported that, *"people are afraid to travel for medical assistance to urban towns."* A KI in one Turkana village indicated community members were not returning to

their village from towns and other communities after the announcement of a government stay-at-home order.

As noted earlier, the international border with Somalia was closed affecting communities in Wajir and in Turkana. Movement in and out of the refugee camp was restricted.

> "...people coming into the village must first report to the area chief and provide a letter of travel authorization indicating that they have been tested and found free of corona virus. Those found to have illegally sneaked into the village are reported to relevant authorities such as the police post or chief. They are arrested and quarantined for two weeks."
>
> – R4; Tana River

3.5 SOCIAL IMPACTS

Figure 4 shows the effects of COVID-19 on social relationships. Approximately one-third of households felt their social relationships with family, friends, and neighbors had gotten worse because of the pandemic, while an equal amount felt it had no impact. Very few reported that these relations had improved. Violence emerged as a theme at a fairly low but increased level. However, 5 percent of households reported that community and household violence had each decreased (data not shown).

Figure 4: Effects of COVID-19 on social relations, Round 4 (% households) (multiple response)

Return of Community Members

In the context of COVID-19 protocols around mobility, protection measures, and business and school closures, many people returned to their villages, including students at boarding schools (primary and high school levels), college and university students, and workers who lost their jobs. As previously described, this caused certain challenges both for the students and workers as well as for their families. For students, they are unable to continue their education. Workers are unemployed, and rather than providing remittances for their families are not an additional "burden." For households, food needs are greater, straining household financial resources due to the greater demand for food. Additionally, school closures and return of young people to their villages have created new challenges arising from "idle time." including sexual relationships (in some cases between children and adults) and early pregnancies.

> "The return of students and those workers who lost their jobs has affected the community.... Parents were not prepared to receive their children..."
>
> – R4; Baringo

Fear of Stigma and Quarantine

With exceptions in a few villages, qualitative data paint an overall picture of reluctance to show or report flu-like or other COVID-19 symptoms due to fear and anxiety over stigma, avoidance by their families if they test positive, isolation, and quarantine. There is additional anxiety regarding the financial costs believed to be associated with quarantine and the effects on the entire family and other contacts who would be forced to isolate. As a result, people are afraid to be tested for the virus. One community in Turkana believes that if tested and found to be positive, you are quarantined and, once recovered, will be forced to pay for medications, estimated by them to be approximately KSh 50,000, which few can afford. Others also noted the costs of quarantining and feeding family members as beyond their capacity. Finally, one of the more drastic effects of stigma associated with COVID-19 is that people avoid seeking medical care for other conditions.

> 'Of late people are dying at home, for example asthmatic patients, because they fear going to hospitals because they might become stigmatized and when found to have coronavirus they will be taken to quarantine and isolation facilities."
>
> – R4; Baringo

Perceptions toward Outsiders

Qualitative data provide detailed insights regarding how perceptions toward outsiders have changed since the advent of the pandemic. In the villages where KIIs took place, no positive COVID-19 cases were known. However, there was notable mistrust, apprehension or anxiety about people who came to the villages from cities and towns, especially those considered hard hit by the disease such as Nairobi, Mombasa, and Nakuru. As a KI from Mandera noted, *"Though the community is in a lockdown state, we always have fears of any persons who have had a recent history of travel in our community."* All three KIs in Wajir County described fear of all outsiders, noting especially people who travel to Somalia for business, as some had tested positive at border checkpoints upon their return to Kenya. KIs frequently described quarantines of people entering the village, including villagers/neighbors reporting those arriving to local authorities to enforce a quarantine or taking their temperature before entering the community. They also stated that households placed jerry cans of water—and soap, if they could afford it—at their entryways and required handwashing before anyone entered the home or mingled there.

> "The coronavirus has partially affected the ability of households to support each other here because people are fearing the uncertainty of when the lockdown will be over, and that has forced people to reduce sharing whatever small they have with others who don't have. Instead, they are trying to safeguard this little they have for the future since it is unknown when the virus will end and things will return back to normal as before."
>
> – R4; Wajir

Intra-Household Support

As previously discussed in Section 3.5 (Utilization of Social Capital) and widely reported by KIs in all counties, households were less able to help each other in ways they traditionally would, due to their own worsening economic situation from the pandemic and implementation of social distancing, stay-at-home orders, and curfews. Fear of contracting the virus also deters some

households from reaching out. Households were described as not being in a position to support others as they once had, thus stopping or reducing what they share with their neighbors and those in need. Some were using their savings to get by and several were reluctant to share given the uncertainty of the future.

Youth

KIs acknowledged the high toll the pandemic has taken on youth, particularly with respect to lack of employment opportunities, education, and security, driven by lack of mobility imposed by the need to adhere to COVID-19 protocols. More youth are in their communities without their usual activities, and it can be challenging to find opportunities to engage youth. A chief in Isiolo observed that youth are *"…being engaged in various programs so as to make them busy not to endanger themselves. Youths are being engaged in football clubs so as not to involve themselves in drugs."*

> "The elderly and orphans who rely on youths were affected when the youths lost their jobs."
>
> – R4; Baringo

Curfews were suggested to have a negative impact on youth employment in particular, since many youth work at night. At the same time, curfews were praised for containing virus spread by young people: *"I believe they [youth] are the biggest culprit of coronavirus spreading. Hence the night curfew reduces their movements, which reduces chances of contact or gatherings and eventually reduces spread of the disease."*

Special Populations

Negative livelihood impacts related to the virus trickle down to people who are dependent on others for income, particularly the elderly, pregnant and lactating women, orphans and the disabled. Access to food by the elderly is additionally complicated because of stay-at-home orders. In Wajir, a psychological effect was noted among the elderly because of information circulating that the virus kills the elderly very quickly.

Widows and pregnant and lactating women were considered more impacted than the general population *"because they depend on the effort of their relatives and neighbors to support them."* People with disabilities often rely on the efforts of relatives and friends, and on direct contact for assistance with daily living. However, COVID-19 guidelines discourage close contact. Some disabled make a living partly by begging, which has also been affected by the pandemic. The homeless and street children have suffered, in particular from hotel and restaurant closures. According to a KI in Isiolo, the national and county government have tried to relocate the homeless and have given them temporary shelters.

Safety and Security

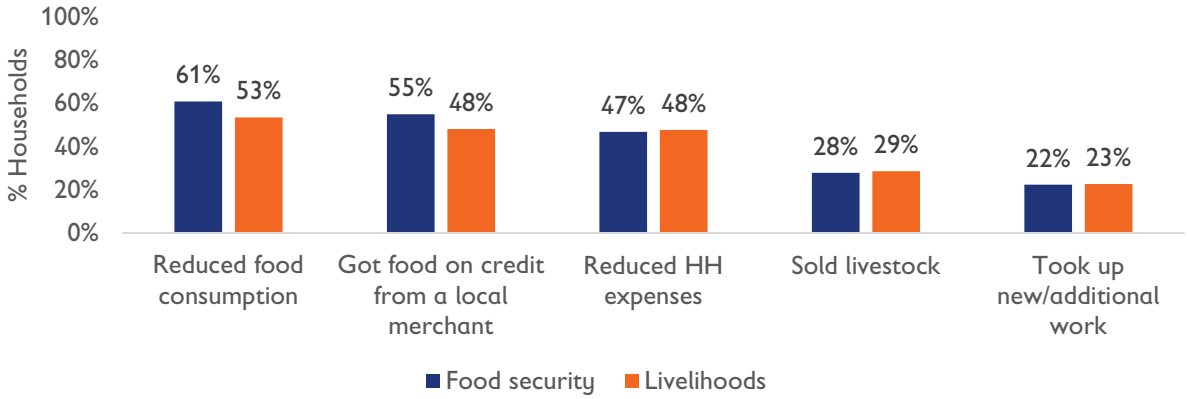
Reports of changes in safety and security were mixed in the qualitative data, with KIs in many villages stating the situation had not changed. However, crime was perceived to have increased in some places due to the worsening economic situation and increased unemployment and idleness of young people. Examples include increased livestock theft, home break-ins, shop break-ins (especially at night, when people cannot watch their shops due to the curfew), and other types of

theft. KIs in Wajir and Mandera stated that insecurity due to the threat of Al Shabaab continues, unrelated to COVID-19.

3.6 COVID-19 COPING STRATEGIES

Specific questions were asked about how households were coping with the impacts of COVID-19 on their livelihoods and access to food. Given one's ability to practice a livelihood is closely linked with their ability to access food, it is difficult to differentiate the strategies used to cope with the impacts on one versus the other. The most common strategies used by households to cope with the effects of COVID-19 on either their livelihoods or food security were reducing the amount of food consumed, purchasing food on credit, and reducing household expenses (Figure 5). Other ways of coping included selling livestock and taking up additional work.

Figure 5: Strategies for coping with the impacts of COVID-19 on livelihoods and access to food, Round 4 (multiple response)



Qualitative data also indicate that households look to reduce the number of daily meals and depend more on wild fruits and other foods. KIs suggested that people look for side work, such as house cleaning, plaiting hair, washing clothes, or small construction jobs (e.g., building bamboo fences). Household expenses might be reduced on things like toys, and purchasing staples (e.g., maize grain, beans, sugar, tea, salt, maize flour) from village shops, where they may be able to buy on credit.

3.7 CONFIDENCE TO COPE WITH EFFECTS OF COVID-19

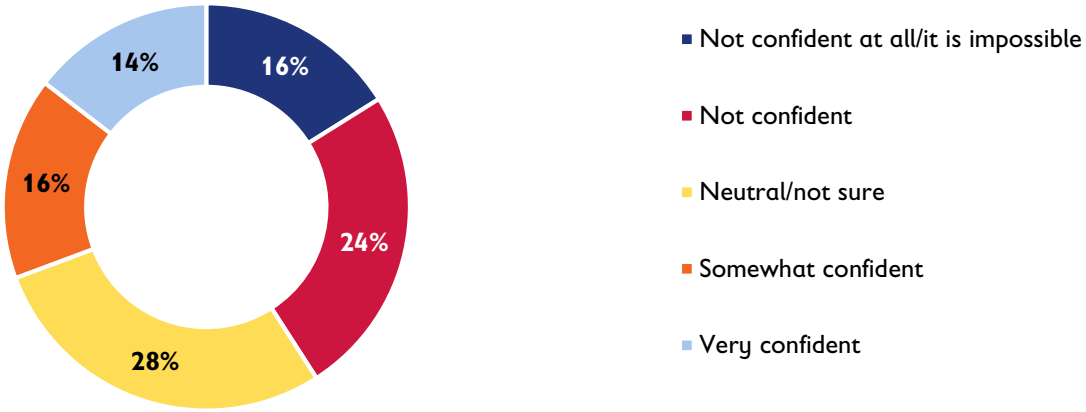
Figure 6 shows household responses to the question, *How confident are you that your household can cope with the challenges associated with coronavirus?* Respondents selected from five response options: *not confident at all/it is impossible; not confident; neutral/not sure; somewhat confident; and very confident,* as well as *not applicable* (not facing any challenge). Responses for *not confident at all/it is impossible* and *not confident* are combined,

> "If this pandemic will continue this way for the next few months, people will die of hunger. Most people in this community earn a living on a daily basis that is hand to mouth. What they get is what they will eat that day. With this situation at hand I cannot see them recovering from it."
>
> – R4; Turkana

as are those for *somewhat confident* and *very confident*. The six households that responded *not applicable* were excluded from the computation.

The majority of households expressed uncertainty or lack of confidence in their ability to cope with issues related to COVID-19. Only one-third of households expressed confidence.

Figure 6: Confidence to cope with effects of COVID-19, Round 4 (% households)



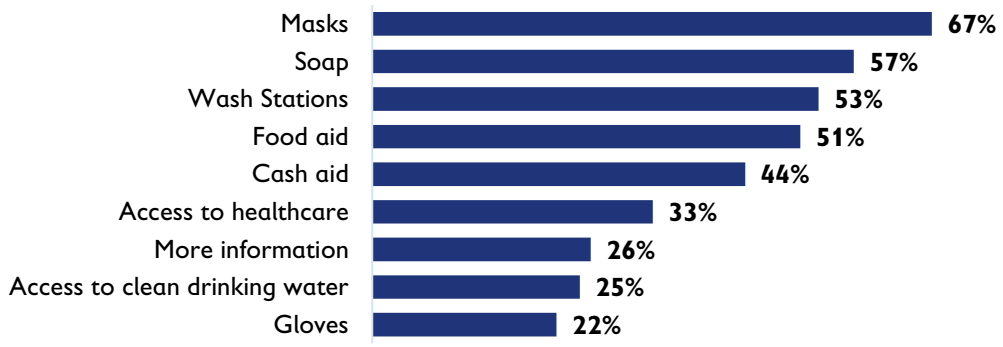
KIs noted that recovery was first contingent on containing the virus, which would then allow for reopening businesses, but that it would take time. In addition, many KIs felt that food and cash assistance were needed to hasten recovery. According to them, many people are highly food insecure, a state that has deteriorated due to the loss of income related to the pandemic.

Recovery was widely expected to be more difficult for the more vulnerable populations such as the elderly, orphans, people with disabilities, the homeless, and the extremely poor, given their higher dependence on help from others. The elderly were noted to face additional challenges given low immune systems and poor diet and nutrition.

3.8 WHAT CAN HELP HOUSEHOLDS COPE WITH THE EFFECTS OF COVID-19

Figure 7 shows what provisions and activities households identified to help them cope with the effects of COVID-19. Masks, soap, and wash stations were perceived as the most needed by a majority of households. As noted in the previous section, households also felt they would benefit from food or cash aid. Social distancing—such as refraining from handshaking and social gatherings—was also mentioned (data not shown).

Figure 7: What would help to cope with effects of COVID-19, Round 4 (% households) (multiple response)



Qualitative data support these findings and provide additional insights. For example, KIs suggested more education about COVID-19 is needed in rural areas where access to information is low and that it—and awareness-raising efforts generally—should be tailored to low levels of literacy. Daily updates from the Ministry of Health should be followed by more specific instructions through available media outlets and there should be social support to prevent stigma for those who have been infected by COVID-19. KIIs echoed the need for food (rations, stipends) and cash assistance (e.g., through SIM cards); expanded distribution of masks, gloves, and soap to make sure there are masks for everyone; and more and improved health facilities. There were also numerous recommendations to continue and expand traditional humanitarian and development assistance, especially in highly vulnerable populations.

KEY TAKEAWAYS: COVID-19 FINDINGS

Overall awareness of COVID-19 is high, but some groups have lower awareness: elderly, children, people who migrate to remote areas, illiterate, people with cognitive impairments.

The main sources of information about COVID-19 are from family and friends, and from radio and television.

Generally, adherence to COVID-19 restrictions is high, although youth and elderly are reported less likely to comply with restrictions.

The most commonly reported negative impacts on households associated with COVID-19 restrictions were: food price increases, lack access to food markets and livestock markets, reduction in income, and increased transport costs.

The most common coping strategies adopted were reducing food consumption, getting access to food on credit, and reducing household expenses. Approximately one-third of interviewed households reported selling livestock to meet household needs.

Households reported continuing needs for support to cope with COVID-19. Over one-half of respondents reported need for PPE: masks soap and wash stations. Over half also reported need for food assistance. One-third reported need for access to health care.

4 DESCRIPTIVE FINDINGS: RESILIENCE INDICATORS

This section describes households' exposure to various shocks, recovery from shocks, coping strategies, and key resilience capacity variables, such as livelihoods, asset ownership, social capital, and participation in training and development activities. The results are descriptive and presented by round, disaggregated in some instances by participation status (see Annex 6, for indicator results disaggregated by participation). The narrative focuses on findings that are statistically significant. Qualitative study findings are integrated to provide context and detail to better understand observed patterns.

4.1 SHOCK EXPOSURE

At each survey round, respondents were asked about the types of shocks their household experienced in the three months prior to that round. From a list of 23 possible shocks, results are presented only for shocks experienced by 10 percent or more of sampled households in at least one survey round.

An overall shock exposure index that takes into account the total number of shocks households experienced and their perceived severity is also presented. Perceived severity is measured using answers to two questions: "*How severe was the impact on your household's income?"* and "*How severe was the impact on your household's food consumption?"* The five possible responses range from *no impact* to *worst ever happened.* The index is calculated as a weighted average of the incidence of each shock and its perceived severity as measured on the five-point scale.

Generally, household shock exposure was relatively low at baseline (Sept 2018), peaked in Round 1 (Sept 2019), and progressively decreased through Round 4 (Table 5). However, the shock exposure index does not provide insights into the specific shocks experienced by households at different times over the course of the RMS Rounds. That is, some shocks may have downstream effects on households, which are often perceived as shocks themselves. For example, climate shocks (e.g., drought, flooding) often result in downstream shocks such as crops pests or livestock diseases.

By Round 1(Sept 2019), most households reported experiencing variable rain/drought and food price increases. However, by Round 4 only one-fourth of households were experiencing drought, while the number of households reporting food price increases had actually increased further, to more than 90 percent. The number of households reporting some shocks increased between the baseline (Sept 2018) and Round 1 and then either stabilized or remained higher than at baseline through Round 4, including for livestock disease, crop pests, unemployment for youth, and agricultural input prices.

As noted in the limitations section, the impact of COVID-19 on households is not specifically captured in the household questionnaire. However, findings from the COVID-specific module and

additional qualitative research questions added in Round 4 point to COVID-19 as a stressor—though less as an illness experienced than as a contributor to downstream shocks (see Section 4). In fact, communities in Garissa, Marsabit, Tana River, and Samburu reported no cases of COVID-19 but experienced loss of income and price increases as a result of government preventative measures for stemming transmission of COVID-19. The closure of livestock markets in some counties (e.g., Baringo, Marsabit, Samburu, Tana River, and Wajir) has reduced income and food security for households whose main livelihood depends on livestock. As a KI in Samburu noted, *"Those who do business of buying and selling of livestock are not doing the business, which their families depend on for food, and those who depend entirely on livestock are now not getting enough."*

Government measures to control the pandemic reportedly had numerous effects on people's livelihoods. Restrictions on the number of passengers that vehicles can carry have led owners to double the cost of transportation, making access to markets and medical care more difficult or unaffordable for some. Small businesses have lost income, and some have lost their casual labor and other employment due to the pandemic, making it difficult for families to access good foods in the face of food price increases.

Table 5: Shock exposure in the months prior to a survey, by survey round

% HH reporting, by type of shock	Sept 2018	Sept 2019	Nov/Dec 2019	Mar/Apr 2020	June 2020
Climate and Biological Shocks					
Variable rainfall/drought	34 (5.5)	83 (5.4)	65 (4.9)	29 (3.8)	25 (4.2)
Excessive rainfall/flooding	40 (4.7)	11 (5)	66 (4.1)	53 (4.3)	31 (4.7)
Livestock disease	26 (5.1)	48 (5.2)	40 (4.7)	42 (4.5)	36 (4.7)
Crop pests	6 (5.5)	9 (5.2)	10 (4.4)	34 (4.4)	23 (4.8)
Economic and Human Disease Shocks					
Food price increase	50 (5.2)	81 (5.3)	69 (4.9)	66 (4.9)	93 (5)
Input price increase	4 (4.6)	22 (5.2)	21 (4.5)	13 (4.2)	27 (4.2)
Ag output price decrease	4 (4.6)	20 (5.7)	18 (4.1)	10 (4.4)	8 (4.3)
Unemployment for youth	9 (5.7)	22 (5.3)	23 (5.2)	25 (5.1)	31 (4.9)
Human disease outbreak	3 (4.7)	27 (4.5)	18 (4.5)	13 (4.4)	13 (4.4)
Delay in Humanitarian Assistance (HA)	3 (5.2)	17 (5.3)	17 (5)	14 (4.9)	4 (4.7)
Shock Exposure Index	10.1	20.6	18.4	15.6	14.9

Note: Numbers in parentheses are the average shock severity value for the respective shock/round, where severity ranges between 2–8 with 8 being the most severe.

Quantitative findings on shocks were generally consistent with information from key informants and focus groups. The qualitative data provided additional detail, for example, about the nature of livestock diseases and crop pests, which were usually closely associated with drought and flood effects. Commonly reported livestock diseases included foot and mouth disease, lungworm/parasitic bronchitis, anthrax, diarrhea, and gastrointestinal sicknesses such as coccidiosis and nematodes, and some mentions of Rift Valley fever. In Tana River County, coccidiosis also killed large numbers of poultry, an important source of income for households. Wild animals (e.g.,

elephants, rhinos, lions) that are under the protection of the Kenya Wildlife Service repeatedly invade farms and eat or destroy crops.

> "As local residents we won't allow the government to spray the locusts because spraying them will kill the bees we rely on for honey production."
>
> – R3; Baringo

KIs in a number of areas reported locust infestations that destroyed crops and vegetation used for livestock fodder, particularly beginning in Round 3 and continuing to Round 4. While some used insecticide spray, traditional methods to scare off the locusts were common, such as noisemaking (e.g., revving motorbikes and cars) and physically chasing away insects. The latter methods may be more common because farmers want to protect their agricultural assets from chemicals.

Economic shocks also were evident in the qualitative findings, such as food price increases and especially a poor market for livestock in later rounds, as animals were thin or sickened after prolonged drought and disease; knowing these conditions, demand was low and prices were low.

FGD participants and KIs also describe some economic changes that had broad effects, such as a nationwide increase in petrol prices (Round 2) and a government regulation of charcoal production.[13] Economic shocks contributed to a range of stresses experienced by households, including reduced quality and quantity of food and the inability to afford medicine or to pay school fees in order to keep children in school.

> "This problem started when the government banned the burning of charcoal because it caused deforestation. Initially…. charcoal sellers were able to sell all their charcoal at once to traders at least every two weeks. But currently, only one bag of charcoal can be sold in one week."
>
> – R3; Turkana

Conflict was not among the top shocks of the sample overall, but it was a persistent issue for certain counties and villages. Cattle rustling was reported in some areas of Baringo and Marsabit, *"especially between May and December when the area has plenty of pasture."* Theft of smaller livestock such as sheep, goats and even chickens was reported in Isiolo and Turkana.

Clashes between neighboring communities over access to land, water, and pasture is a recurring stress in Garissa and Marsabit especially during drought and can lead to loss of human and animal lives. Similarly, in Mandera, respondents report "normal" inter-clan land disputes between nomads and that drought conditions can lead to increased conflict between communities protecting water sources. However, in Samburu, respondents reported improved security in the county as communities are working together to address drought conditions and water scarcity.

[13] The KI did not specify when this regulation came into effect.

Persistently high levels of insecurity and fear due to the threat of attacks by Al Shabaab from neighboring Somalia were described by KIs in Wajir at all rounds of data collection, though no specific incidents were reported.[14] In contrast, KIs from all rounds in Mandera report instances of terrorist attacks from Al-Shabaab within the region, especially in Rounds 3 and 4. Specifically, there is concern over their continued attacks on the local transportation system and roads in the region. In Round 3, a KI noted a "mass transfer" of non-local teachers, who fear they are being targeted, and that Somali troops are in Mandera, further creating tensions in the area.

> "They [terrorists] blocked all the main roads that the government officers could use to reach us, thus no official was able to reach us, and the people could not reach the government facilities either due to high insecurity in the region."
>
> – R3; Mandera

In Garissa, communities feel perennially insecure due to the presence of unpredictable, violent extremist groups in Dadaab. In other areas of Garissa, politicians are blamed for inciting violent rivalries over resources for their own purposes. Insecurity and fear in the county have resulted in a loss of agricultural extension, health, and education services as government personnel are not allowed to travel to insecure areas. Teachers, nurses, and laborers who are not from the area have left due to fear of attacks. As a result, schools have closed and people must travel long distances for health services.

There was a slight spike in human illness reported as a shock for some households in Round 2, though less than 30 percent of households were affected by this type of shock in any round. KIs named several diseases and illnesses prominent in their area, such as malaria, cholera, typhoid, amoebic dysentery, and HIV/AIDS. See Appendix 3 (Table 13) for more details on illnesses experienced across the RMS period.

It bears noting that households experience shocks within a context of chronic stress. KIs and FGs described numerous ongoing challenges to community well-being (Appendix 3; Table 14). While nearly all community members were affected to some degree by shocks, the most affected were female-headed households, the elderly, and persons with disabilities.

4.2 COPING STRATEGIES

Households employ a wide range of strategies to cope with shocks and use different strategies over time (Table 6). In general, there is an upward trend in the use of coping strategies over time, which might suggest a lack of recovery or worsening conditions. With a few exceptions, people continued to rely on most coping strategies over the course of all four rounds of data collection. However, exceptions include receipt of emergency food aid, gifts of money/food from family and friends, migration of some family members, and sending children to stay with others, all of which dipped to some degree after Round 2. Thus, fewer households were relying on "outside" help as time passed, which might suggest at least some degree of recovery or being able to deal with the shocks they were experiencing in Rounds 3 and 4. Alternatively, less reliance on family and friends

[14] No KIIs or FGDs conducted in Wajir in Round 2.

(whether for food, money, or taking in children), in particular, may suggest a weakening of informal safety nets; considering the drought and subsequent pandemic, people were essentially "tapped out" and simply had too little—or nothing—left to gift. The dip in the use of these coping strategies coincides with an increase in several negative food coping strategies, such as reducing food consumption and household expenses, as well as purchasing food on credit, all of which increased between the baseline and Round 1 and remained high or continued to increase through Round 4.

Table 6: Coping strategies used in the months prior to a survey, by survey round

% Households reporting, by type of strategy	Sept 2018	Sept 2019	Nov/Dec 2019	Mar/Apr 2020	June 2020
Food coping strategies					
Reduced food consumption	33	58	53	54	66
Received food on credit	21	51	47	51	60
Reduced household expenses	20	33	39	38	50
Spiritual efforts/prayers	5	18	23	27	23
Received money/food from family/friends	1	6	18	15	12
Livelihood coping strategies					
Took up new work	5	29	29	30	31
Used savings	6	12	18	19	18
Received emergency food aid	3	15	14	2	6
Some family migrated	2	3	13	10	2
Sent children to stay with others	1	5	14	9	7
Livestock coping strategies					
Sold livestock	33	41	47	41	44
Slaughtered livestock	7	13	15	13	14
Sent livestock in search of pasture	6	26	17	19	23

Qualitative insights validate most of the quantitative findings. **Food consumption reduction** strategies were widely practiced and increased over time. Eating smaller quantities of food, skipping meals, and eating less preferred or less expensive foods were all mentioned by FGs and KIs. **Purchasing food on credit** and **reducing household expenses** also increased markedly between the baseline and Round 1, and remained high through Round 3, after which they again increased. At Round 4, at least one-half of households reported using each of these food coping strategies.

> "Most of the households tend to adopt skipping of meals to overcome food shortage at household level."
>
> – R1, Marsabit

The impact of COVID-19 and measures to mitigate its transmission likely contributed to these trends. Communities were dealing not only with specific shocks but also with the impact of the pandemic on their livelihoods and health. As described in qualitative interviews, the closure of livestock markets, high unemployment rates and food price increases resulting from COVID-19 mitigation measures had a significant negative impact on household incomes. According to a KI in Tana River, *"The emergence of coronavirus has affected households' ability to support each other . . . and most households only manage to acquire enough to cater for their household's needs only."*

> "We have reduced the quantity of food that we eat and the number of meals that we eat on a daily basis. Mostly, we eat breakfast and supper only or just one meal in a day as opposed to the three meals that we used to consume."
>
> – R2; Isiolo

In Marsabit, many households established kitchen gardens to enhance their food security. Purchasing food on credit can have negative consequences if households become indebted and are unable to repay the loan(s). In Tana River, it was mentioned that people **buying food on credit** may be *"limited to certain food items but are not charged any interest."* Such a practice may help keep people from incurring too much debt that cannot be repaid at a later date.

In many communities (e.g., Garissa, Samburu, Mandera), the most vulnerable households receive unconditional gifts of food and money from other households or from community fundraising efforts to help them cope with shocks and stresses. By Round 4, however, some communities (e.g., Marsabit) had discontinued fundraising for special needs like school fees, medical bills, weddings, and funerals due in large part to the effects of COVID-19.

Although **receipt of emergency food aid** is low overall, there was a noticeable dip in reliance on emergency food aid after Round 2. Few communities reported receiving significant amounts of emergency food aid for the most vulnerable members, and KIs in Tana River indicate that the aid distribution schedule is inconsistent and not reliable. Interviewees mention small, one-off distributions by local government (e.g., Marsabit) or the provision of relief food by WFP and local NGOs (e.g., Turkana, Garissa, and Mandera). The most vulnerable households receive support from government safety net projects such as the *Inua Jamii* (cash transfer) program and the Hunger Safety Net Program, which KIs in Garissa, Mandera, and Marsabit report helped improve the livelihoods of most households. In Tana River communities, households barter goods to cope with shocks and stresses, *"…by exchanging what you have in your household with what the other household doesn't have, for example, foodstuffs like maize in exchange with beans, maize flour in exchange for vegetables, maize in exchange for rice or bananas, etc.."*

Across all four rounds of the RMS, approximately one-third of households **took up new work** as a way of dealing with shocks and stressors. Government offices and NGOs encouraged women and youth in particular to form self-help groups (e.g., in Turkana) and to apply for government funds to start small-scale businesses to improve their livelihoods. Youth are also encouraged to enroll in vocational training to gain business skills and households engage in savings and loan programs so that they have access to loans when emergencies arise. In some areas (e.g., Turkana), women take up burning and selling charcoal to have an additional source of income, as

well as independence. Other income-diversification activities include setting up kiosks and small hotels, starting a *bodaboda* business, and in pastoralist communities, increasing agricultural activities. In addition to seeking new income sources, many households were reported to borrow money from relatives and friends to get by (e.g., Isiolo).

Although **self-help savings groups** were mentioned in most areas, less than one in five households reported using savings as a way to deal with shocks or stressors in any round, including to feed their family, invest in productive activities (e.g., buy livestock or productive inputs), or to pay for health expenses, education costs, and other household necessities. According to one member, *"Such schemes are helpful since they help us to manage our daily needs though they do not have long-term benefits because the money raised is usually not a lot, just enough to get you by."* In Isiolo, neighbors, friends, hawkers or small business owners that share common goals and intentions come together to start merry-go-round groups, although social relations and wealth can play a role in determining whom forms a group. For example, a men's group (in Isiolo) formed to raise funds for burials and weddings. However, these informal groups have their limitations, and can involve risks to members; when members unexpectedly drop out (e.g., due to shocks or stressors), it can interrupt the savings / payout cycle and put the entire group at risk. In particular, COVID-19 and its impacts have made it more difficult for members, particularly women, to pay their monthly fees. As one KI in Samburu noted, *"If you don't contribute for two consecutive months, you are removed from the group and lose your savings."*

> "[Self-help groups] create an avenue for financial stability because people have easy access to (merry-go-round) loans by members so that they can be able to support each other."
>
> – R3; Samburu

> "The women in the community have prepared themselves for future shocks and stress by creating a women's group. They use it to help each other buy household assets and raise money weekly or monthly to cater for the household needs."
>
> – R1; Isiolo

Sales of livestock was another common strategy used by households to respond to shocks and stressors. As noted for other coping strategies, selling livestock jumped between the baseline and Round 1, where it stabilized through Round 4. KIs in several locations reported that households sell livestock before a drought and save the money for future use, a strategy learned from government and NGO programs. A few households in Marsabit and Samburu purchased livestock insurance as a coping strategy against drought and theft; however, drought insurance was not available in most areas (e.g., Baringo, Isiolo, Turkana, Wajir).

In areas of recurrent drought, livestock-based households coped by **migrating temporarily to find pasture and water** for their animals, while farmers affected by floods (e.g., Tana River) feel they can do little other than to start over again after floodwaters recede. Similarly, in Samburu, lack of water due to drought, forced *"…men to migrate to far places to look for water for livestock."* In Mandera, floods and malaria have forced migration to higher ground or away from the riverbank. Households in Turkana migrated to other parts of the county temporarily to protect their livestock from an outbreak of foot and mouth disease. Temporary movement of livestock for

health reasons was also reported in Wajir, where community members feared that the chemicals sprayed in locust eradication efforts would harm or kill their animals.

LIVESTOCK

Other livestock-related coping strategies noted by KIs include:

- Households setting aside part of their farms as pasture for their livestock;
- Diversifying livestock breeds to more drought-resistant breeds such as camels, donkeys and goats
- Saving fodder for livestock
- Building temporary shading for livestock

KIs in Isiolo, Mandera and Samburu stated that due to lack of pasturelands many communities have either formed graze land management groups and/or made rangelands communal, *"…where a community will establish rangeland groups to manage the land,"* to prevent overgrazing and convert grazing lands for next season. In Isiolo, community-based committees manage the movement of livestock and use of grazing land, which is divided into sections for management purposes. Livestock are allowed to graze on some sections while others remain ungrazed. Over time, livestock are rotated through ungrazed areas, allowing grazed pastures to regenerate. This controls the influx of livestock and provides access to pasture even during the dry season. In this case, *"The committee members are only men because they are the ones that take care of the livestock and security."*

It was widely reported by households that **family members migrated to urban areas to look for employment and casual labor** (e.g., as housekeepers, groundsmen, waiters, security guards, *bodaboda* drivers) so they could send money back to their families. While KIs normally reported migration as a positive coping strategy, in some cases it can have detrimental effects on the household. KIs and FGs in Isiolo and Wajir, in particular, stated that many youth who migrated to cities became involved with drugs and substance abuse. The drop in migration of some family members between Round 2 and Rounds 3–4 may be due, at least in part, to lockdowns and restrictions on movement related to the pandemic.

Taking children out of school was described as a strategy to cope with shocks in Wajir. This also happened forcibly due to COVID-19 restrictions: in Round 4, communities in Garissa, Tana River, and Samburu reported a return of students and those working in larger towns, as schools closed and many laborers lost their jobs. In some cases, this creates additional strain on households, as returning household members are unemployed and are returning to vulnerable households.

> "Most of the youth moved to towns. Support to their families decreased since most of them go out and learn bad cultures and they become irresponsible, and they don't care anymore about the family members they left behind-—hence the livelihood back home goes down. A few bring support when coming back home to the community."
>
> – R3; Samburu

In Round 4, some communities in Marsabit, Tana River, Samburu, and Mandera reported monitoring movement into and out of their boundaries and require that people coming into the community from other parts of the country visit the health center and be tested, or quarantine for 14 days. In Mandera, KIs noted that students from large cities are unable to return home due to COVID-19 restrictions.

KIs in Baringo, Garissa, and Wajir described a positive coping strategy used by communities whose livelihoods are threatened by insecurity: the **establishment of peace committees** (*Nyumba Kumi*), which are composed of elders, religious leaders, local officials, school heads, and women and youth leaders who monitor any insecurity in an area and report it to police. Members also preach the importance of peace. During the COVID-19 pandemic, the *Nyumba Kumi* committees also monitor people's social behavior and movement in and out of the village, and advise travelers to quarantine as a precaution against the spread of coronavirus. Other effective conflict resolution structures exist in many areas.

Across all survey rounds, KIs report households needing to harvest water, dig boreholes/water pans, or pay for household water, and/or doing so in preparation for the dry season.

4.3 RECOVERY FROM SHOCK

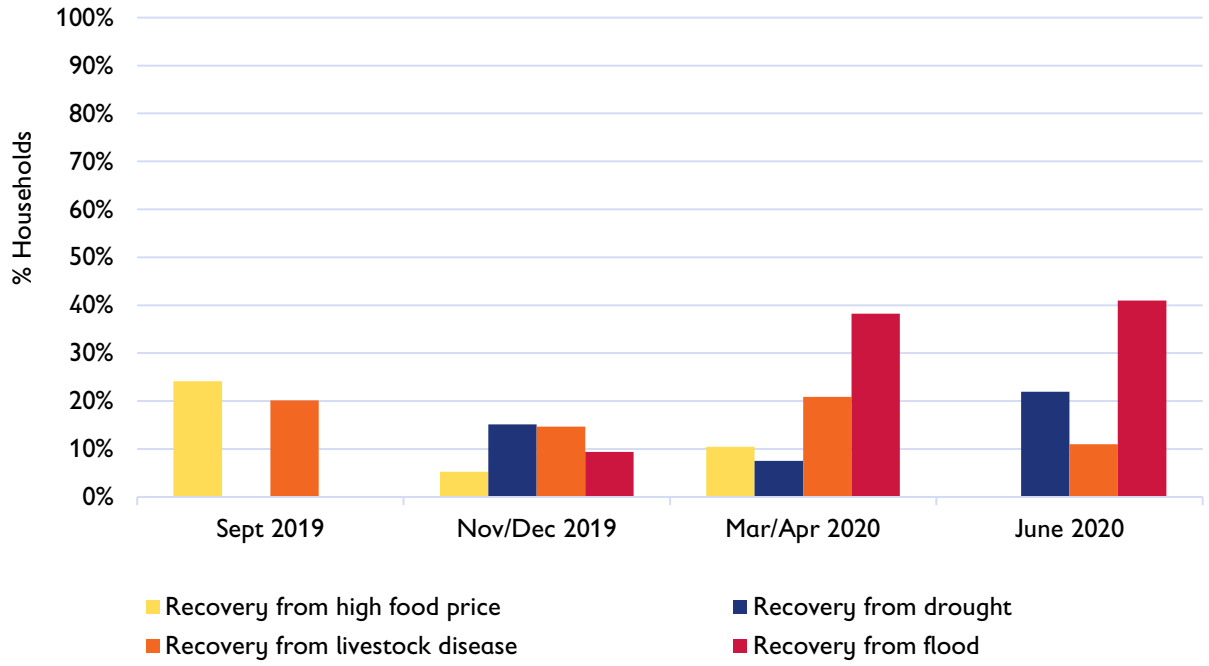
For each shock that households experienced in the three months prior to a survey round in the RMS, respondents were asked the extent to which their household had recovered. Households were considered "recovered" if they reported (1) or (2) from the response options below:

1. Fully recovered, and better than before the shock
2. Fully recovered, same as before the shock
3. Partially recovered
4. Did not recover
5. Not affected

Figure 8 shows recovery from the four most prevalent shocks experienced by households. Recovery from any individual shock varied by round. By the end of the RMS period, households

were recovering from flood and drought, but still struggling from livestock disease and high food price shocks, both of which had increased in Round 2 and remained high through Round 4 (see Table 5).

Figure 8: Recovery from the four most prevalent shocks in past three months, by survey round



One should keep in mind, since the retrospective period between rounds is so short (three months), some shocks will be ongoing and make the likelihood of recovery low. In contrast, households who experience shocks of short duration, such as floods, are more likely to show recovery over time.

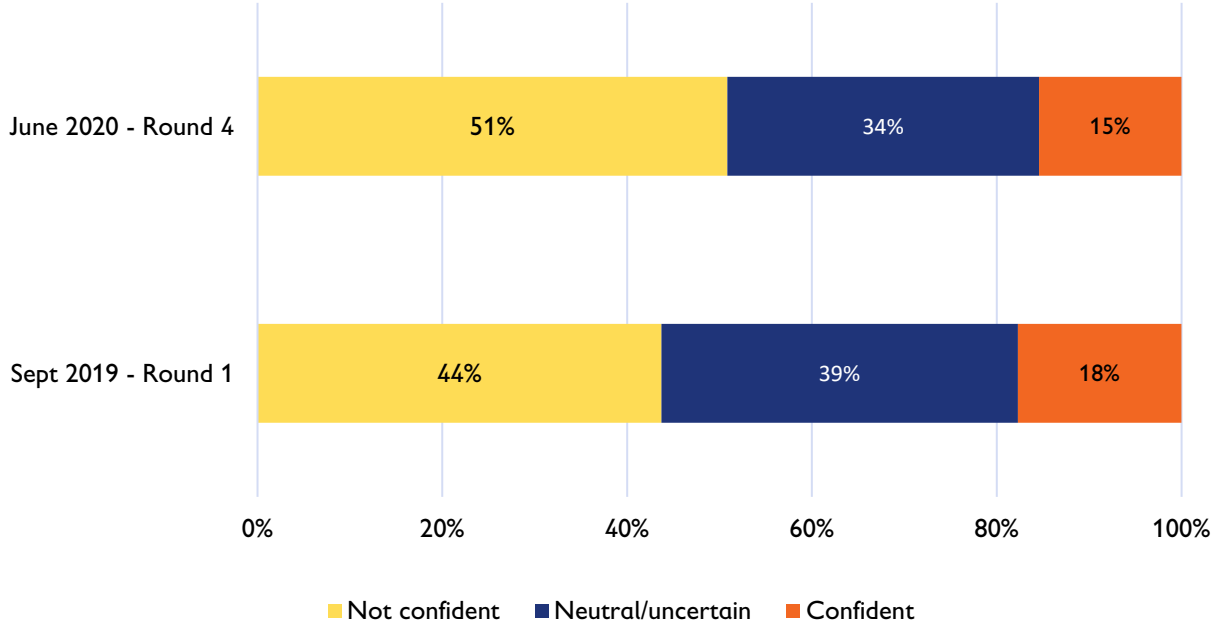
4.4 CONFIDENCE TO COPE WITH FUTURE SHOCKS

Resilience analysis includes assessment of people's attitudes and motivation to "help themselves." That is, it is a necessary but not sufficient requirement to have certain skills and abilities, and access to resources in order to effectively deal with shocks and stressors; people must also be motivated to apply their skills, abilities, and resources in response to shocks and stressors in ways that do not compromise their well-being. This section presents findings for household responses to the question, *How confident are you that your household can cope with a severe shock in the next three months without significant depletion of assets, harm to family members, or damage to household livelihood activities?* Respondents selected from the five response options: *not confident at all/it is impossible; not confident; neutral/not sure; somewhat confident; and very confident.* Responses for *not confident at all/it is impossible* are combined with *not confident,* and *somewhat confident* is combined with *very confident.*

> "The community is very poor and unable to feed themselves in the future. The confidence to deal with shocks is very low."
>
> – R1; Mandera

Confidence levels varied minimally across rounds. Thus, Figure 9 shows only results from Rounds 1 and 4. The majority of households expressed uncertainty or lack of confidence in their ability to cope with future shocks across all rounds of the survey.

Figure 9: Confidence to cope with future shocks, Rounds 1 and 4



A low level of confidence in coping with future shocks is pervasive in the qualitative data as well. In all rounds, KIs and FG participants described communities as having a poor outlook on the future, citing poverty, lack of capital to invest in small businesses or livelihood assets (e.g., livestock vaccines), low skills and capacity for adapting to shocks, and a dependence on government for development and emergency assistance. The data suggest that in the context of persistent poverty in the sampled areas, the recurrent shocks overwhelm community capacity to deal with them on their own. However, in some villages, confidence to cope with future shock can be seen in a more pragmatic hope that the drought will come to an end, *"We have the hopes and confidence that this drought will end in a short period, like one month."* A few communities in (e.g., in Garissa) see drought, conflict, and unemployment as routine shocks that they have developed common strategies to mitigate and so are more confident about dealing with those shocks. However, these same communities lose confidence when there is crop or livestock disease or when malnutrition is high.

> "The community will recover when coronavirus ends. This is because everyone will be able to go back to their normal life, for example return to jobs or when markets open people can go back to selling their animals at good prices."
>
> – R4; Samburu

KIs voiced that coping with future shocks will continue to be more challenging due to recent COVID-19 restrictions (such as market closures and travel restrictions) affecting employment and livelihood opportunities. Nevertheless, some KIs indicate a belief that after COVID-19 there will be a normalization of community activities, allowing for an improved ability to cope with future shocks. This sentiment, however, was not ubiquitous across all villages, as some were more skeptical the community would be able to return to normal. KIs in Garissa echoed the feeling that recovery will be difficult due to the economic impact of COVID-19 restrictions on markets, job loss and incomes, and on household food insecurity.

> "There is no confidence in the people's future in the community because most of the shocks they encounter require government interventions. Shocks such as floods require a lot of money to build gabions to control the pathway of the river Turkwel or alternatively they require resettlement from this flood-prone area."
>
> – R3; Turkana

People's confidence in their ability to deal with future shocks is, to some degree, linked with their confidence in the government. Significant investments in infrastructure, such as flood mitigation structures, boreholes, health infrastructure, and roads are areas of acute need where communities look to government. For the most part, communities feel they do not have sufficient government support for them to effectively respond to shocks—now or in the future. In Isiolo, a men's focus group explained that they do not have at their disposal the types of resources needed, such as boreholes for both domestic and livestock use, local markets, larger water pans, or tarmacked roads. For these, they rely on the government.

> "Our leaders—both political and community leaders—do nothing to support or help us to overcome or prepare adequately to survive from the effects of these shocks; they are corrupt."
>
> – R2; Isiolo

Praise for government support and optimism about the prospect of government support were limited. KIs in Baringo felt that devolution has improved some aspects of government action, including faster response to certain shock events (e.g., human illness/disease) and investment in infrastructure such as gabions. In addition, they indicated that the government provides relief food during drought, and vaccinations and treatment during livestock disease outbreaks. As one KI put it: *"Whenever there are disasters the confidence of locals is in the government as they expect support from the government. During distress/shocks, locals have a lot of confidence in the government because all their problems can be solved by the government."*

However, most qualitative findings on government assistance were critical and pessimistic. People complained of unfulfilled promises, delays in response, corrupt politicians fomenting conflict between neighboring communities to gain control over land and other resources, police bribed to ignore complaints about theft, and perceptions of favoritism and unfair treatment of one group in favor of another. In Tana River, male and female FG participants complained that the government-owned KenGen dam releases excess water without notifying communities, destroying crops and even homes and animals.

The very few expressions of confidence in the future were associated with religious faith (Mandera, Samburu, and Wajir) and that God will help. In Mandera, respondents expressed a belief that faith would alleviate the shock, improving their future: *"We are hopeful that this will not be permanent and God-willing we may receive rain in the next one month or so."*

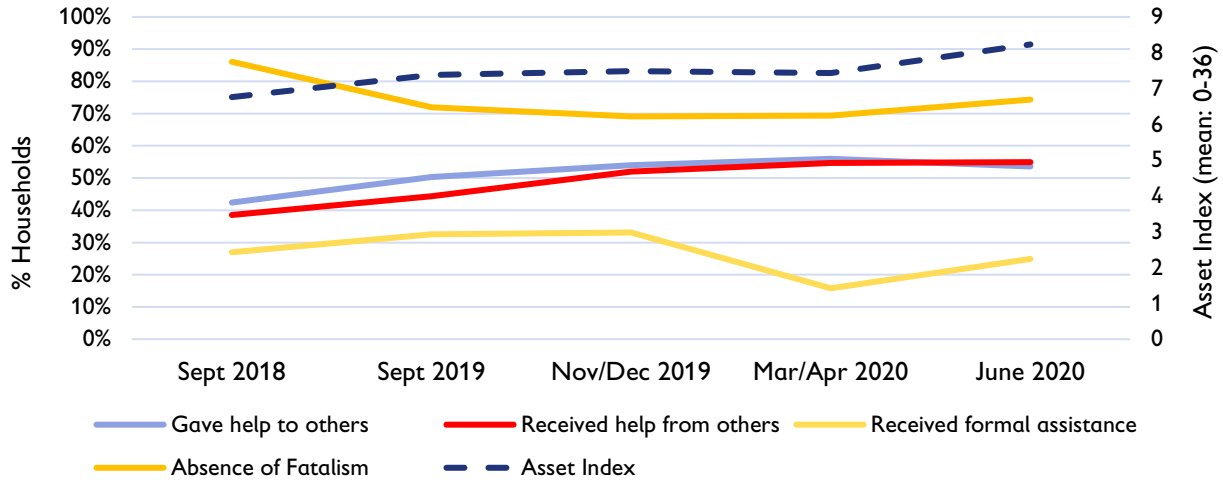
4.5 KEY RESILIENCE CAPACITY VARIABLES

In order to minimize the time of interview, the RMS questionnaire only collected information about a limited number of key resilience capacity components, particularly those in which changes can be expected to be observed within a short time span and that were found to be significantly related to food security or economic outcomes in the baseline study: assets, humanitarian assistance, aspirations and confidence to adapt (absence of fatalism). In addition, questions about utilization of social capital (actively receiving from others or providing assistance to others) was also included, based on findings from the RMS studies undertaken in Ethiopia, which showed that social capital may erode over time as households are exposed to large and ongoing shocks.

Figure 10 shows the main resilience capacity components that are tracked in the RMS surveys: giving and receiving assistance from others (i.e., social capital); receipt of formal humanitarian assistance; asset index; and an absence of fatalism index,[15] which reflects households' confidence in the future.

Social capital (i.e., support to/from friends, family) increased between the baseline and Round 1 but remained fairly constant through Round 4; approximately one-half of households report they had given or received support from friends or family at any point over the RMS period. The mean asset index score remained stable across rounds. This suggests that while households were not growing their assets, neither were they depleting them due to shocks or other hardships.

Figure 10: Utilization of social capital, humanitarian assistance, and assets, by survey round



[15] Absence of fatalism is an index that ranges from 0–2 (but for purposes of illustration, is normalized in this figure to a range of 0–100.) The questions comprising this index are: 1) Which statement do you agree with most- a) Each person is primarily responsible for his/her success or failure in life, or, b) One's success or failure in life is a matter of his/her destiny; 2) Which statement do you agree with most- a) To be successful, above all one needs to work very hard, or, b) To be successful, above all one needs is to be lucky. A score of two on the absence of fatalism index corresponds to responses 1a) and 2a).

Receipt of formal humanitarian assistance dropped by nearly one-half in Round 3, which may, in part, explain the small uptick in informal support (social capital) at the same time. Formal assistance picked up again in Round 4, which may be due to COVID-related support. Absence of fatalism fell from baseline to Round 1—a desired outcome indicating increased confidence in the future—and remained at that level over the RMS period.

Asset Ownership

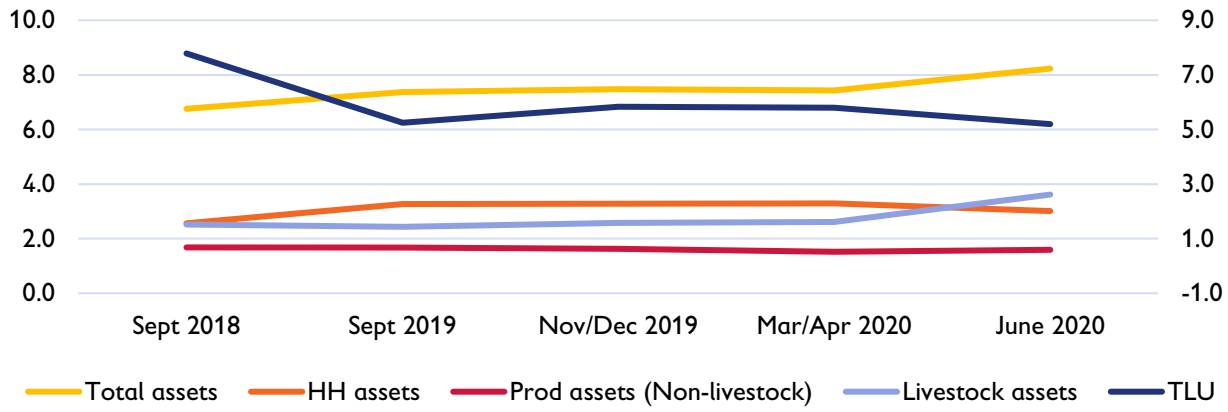
Households have at their disposal several types of assets, including ***household assets*** (e.g., radio, television, sewing machine, gas stove, electric stove), ***productive assets*** (e.g., hoe, axe, agricultural land), and ***livestock assets*** (e.g., ox, cow, poultry, sheep, goat). Figure 11 shows sample means for two types of variables:

- **Counts of asset types:** The survey collected data on the number of different types of assets a household owns (rather than the number of items owned). For example, if a household owns one or more radios and no other household assets, the value of the household asset variable = 1. If the household owns one or more radios and one or more sewing machines, the household asset variable value = 2. The ***total assets*** variable is the sum of the three sub-asset variables (maximum possible range: 0–64). The maximum observed total number of assets = 36.

- **Tropical Livestock Unit (TLU):** The TLU is the weighted sum of the number of livestock a household owns. Higher-value livestock are assigned higher weights.[16] The TLU is a better measure of livestock value than the sheer count of animals owned.

Overall, the total number of asset types was fairly stable across the four rounds, with a slight uptick in Round 4, driven by a corresponding increase in livestock assets (Figure 11). However, the TLU decreased between baseline and Round 1, where it remained fairly constant through Round 4. The decrease is a result of changes in the type of livestock owned by households; in Round 4, households had more chickens and fewer goats, which are higher-value animals. On average, households had fewer than two types of productive assets in any survey round.

Figure 11: Types of assets, by survey round



[16] Conversion weights: cow 1; goat or sheep 0.4; chicken 0.01.

The qualitative data indicate that distress sales of livestock are typical in times of drought to generate needed income, pay medical bills or debts to vendors and shops, buy drugs for sick animals, offload sick animals, or reduce the number of animals they need to care for. In Samburu and Mandera, multiple KIs acknowledged distress sale of livestock during shocks. However, villagers are becoming more cognizant of both the negative effects of distress sales and the difficulty of the sale itself. Sales of livestock during times of shock are more difficult as animals are sick and emaciated, leading to either severe drops in the prices offered for animals, or a lack of local buyers. In Samburu, KIs report trying to mitigate this problem by selling their livestock prior to drought, allowing households to diversify their assets away from only livestock into cash as well. Some communities (e.g., Turkana, Samburu, and Garissa, Marsabit) have been trained to sell their excess livestock to maintain a manageable-sized herd. A KI in Mandera noted, *"The community destocking policy has made the members understand that there is a great loss in times of drought and diseases for one with too many livestock."* Households have sold livestock to pay for food, animal fodder, health care, and education costs/school fees. Livestock are either sold in larger towns with livestock markets or sold directly to brokers who come to the village. KIs in Isiolo also mentioned a shift to rearing breeds (e.g., camels, goats, cattle, and donkeys) that can endure the mostly hot and dry climate, where rainfall is low and unpredictable.

> "During such hard times we sell our livestock at a cheaper price when they are still healthy and strong. This is to help us overcome the adverse effect that drought has on our livestock, including death and loss of weight."
>
> – R2; Isiolo

Livestock assets are further reduced by low reproductive rates in animals that are malnourished, sick or otherwise suffering from the effects of drought. Low production of milk and meat reduces income and makes it more likely such animals will be sold. Healthy animals, which bring higher prices, may be sold to purchase drugs to treat other, sick animals. FGs and KIs named a wide variety of reasons for why they sell their livestock, including an unfavorable market for selling livestock during shocks such as drought and animal diseases. Appendix 3 (Table 15) provides a summary.

Households experience livestock losses for reasons other than sales, slaughter, or death. In some areas (e.g., Garissa, Marsabit), KIs indicated livestock losses from theft (e.g., from neighboring communities) are common, due to conflict over limited pasture and water during the dry season or livestock raids during rainy seasons. Lack of access to government livestock extension services, particularly due to security concerns (and subsequent removal of livestock to remote locations), and the inability to pay for veterinary assistance were also cited as contributing to animal losses. In Tana River, KIs noted attacks by hyenas as animals were walked to markets as causing livestock losses, as did habitual livestock raids by rival groups seeking to build their wealth in Marsabit.

With low prices for livestock, and continued stresses, some households were reported to sell other types of assets such as motorcycles and mattresses. Many households do not have a great number of assets to sell in times of need, nor are their assets diverse. For example, in nomadic pastoral communities in Turkana, households with little or no sources of income end up selling

one goat or sheep periodically (e.g., once a month). The amount of money they get ranges from KSh 2,000 to 5,000, which cannot sustain a household for a month. As nomadic households, they do not own tables, chairs, radios or other household assets to sell, even if they wanted to. Other households do not own livestock at all; it is either not their livelihood, they live in urban areas, or they do not have the resources to purchase and care for livestock.

Utilization of Social Capital

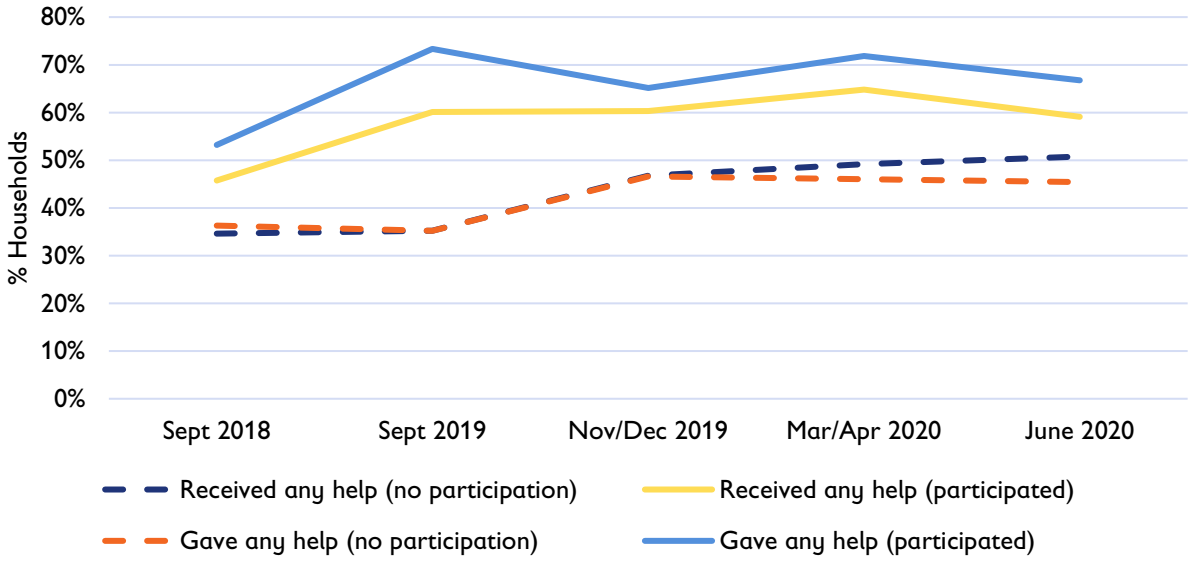
Social capital refers to the bonds between community members and across communities. It involves principles and norms such as trust, reciprocity, and cooperation. Community members often draw on social capital in times of shock, when survivors work closely to help each other to cope and recover (Frankenberger et al., 2013). Within the resilience framework, household-level social capital has two primary forms: bonding and bridging. Horizontal links between people within more proximate geographies (e.g., within a village or community) are part of bonding social capital; more-dispersed horizontal links with those in less-proximate geographies (e.g., in different villages or communities) represent bridging social capital. At baseline, social capital was measured as the *potential* a household had for being able to provide help to others' if they needed it, and if the household could receive help from others if they needed it. For the RMS, household *utilization* of social capital is measured, i.e., did households actually rely on or provide help to others?

For the RMS, utilization of social capital is based on four questions about whether the household received help in the form of money, food, or other assistance in the three months prior to each survey round from relatives inside or outside of the community and from non-relatives within or outside of the community, and whether the household provided help to the same four groups. Two binary variables are created that represent a) whether or not a household received support from members within or outside the community (*received any help*), and b) whether or not a household gave any support to members within or outside the community (*gave any help*).

Findings on the utilization of social capital are disaggregated by participant and non-participant households (Figure 12). Several patterns emerge: first, both giving and receiving help are more commonly practiced among participant households than in non-participant households; this is a statistically significant finding. Second, while giving and receiving help shows a general upward trend for both participating and non-participating households, non-participant households did not initiate that trend until after Round 1, whereas participant households increased their use of social capital dramatically between baseline and Round 1, and it remained high over time.

In general, the qualitative data help explain the variation shown in the quantitative data in that, with some exceptions, people share when they can but in the hardest of times only better-off households can afford to share. Hence, the practice of giving and receiving support ebbs and flows and depends on the resources of a given household at any point in time. KIs and FGs gave numerous examples of how households customarily help each other to cope with shocks. These are detailed by county in Table 16 (Appendix 3) and summarized below.

Figure 12: Giving and receiving help, by participation status, by survey round



Qualitative insights suggest that sharing food is one of the most common ways people typically help each other in times of need. Giving or loaning money and livestock to meet basic needs were also mentioned often. It is also common for households to contribute or raise funds in the event of a death in the community and for ceremonies such as burials and weddings. Although giving and receiving help showed upward trends over time, many FGs and KIs indicated little or no change in support over survey rounds and that households, *"seem to have extra care for each other during shocks and stresses."* Overall, households continue to share even when their own resources are inadequate. In Samburu, it was noted that while supporting vulnerable households through food or financial support can be more difficult during times of stress, other forms of support are still practiced, such as fetching water or firewood.

> "We donate foods like maize, beans, tea leaves and oil together; mostly we assist the destitute families with some basic needs like food and even animals."
>
> – R1; Mandera

> "Those who are well-off traditionally help the poor with money, food, livestock, clothing and other items, but it reaches a point where they also get tired of assisting, with the fear that their income may go down. Drought has brought so many changes in people's behavior in this community in the recent past. Initially people here were very generous and used to share the small amount they have with those that don't have, but nowadays people don't share the little they have any more. They have become so mean."
>
> – R2; Tana River

However, comments about households' decreasing capacity to share resources became increasingly common between Round 3 and Round 4. In some cases, this was due to the broader worsening economic context and inflation (e.g., Isiolo). For example, due to inflation, households may have previously been able to give KSh 100 but now could only afford to give KSh 50. In other cases, reductions in ability to share were due to floods (e.g., Isiolo, Mandera, and Turkana), where every affected household is struggling, or drought, as in Tana River and

Mandera, where there is some evidence that the culture of assisting vulnerable households is being eroded by recurrent shocks.

By R4, the economic effects of COVID-19 restrictions were starting to be felt. KIs in Isiolo, Mandera, Wajir, and Samburu indicated that there had been changes in the way households support one another because of the pandemic. Better-off households were less able to support more vulnerable households because of the increased prices for sugar, tealeaves, milk, rice, etc. Households struggled to make ends meet after schools were forced to close, creating pressure on household food budgets with "extra" mouths to feed. Community fundraising decreased because no one was in a position to assist their neighbors. Social distancing guidelines have also impacted behavior and reliance on others for help.

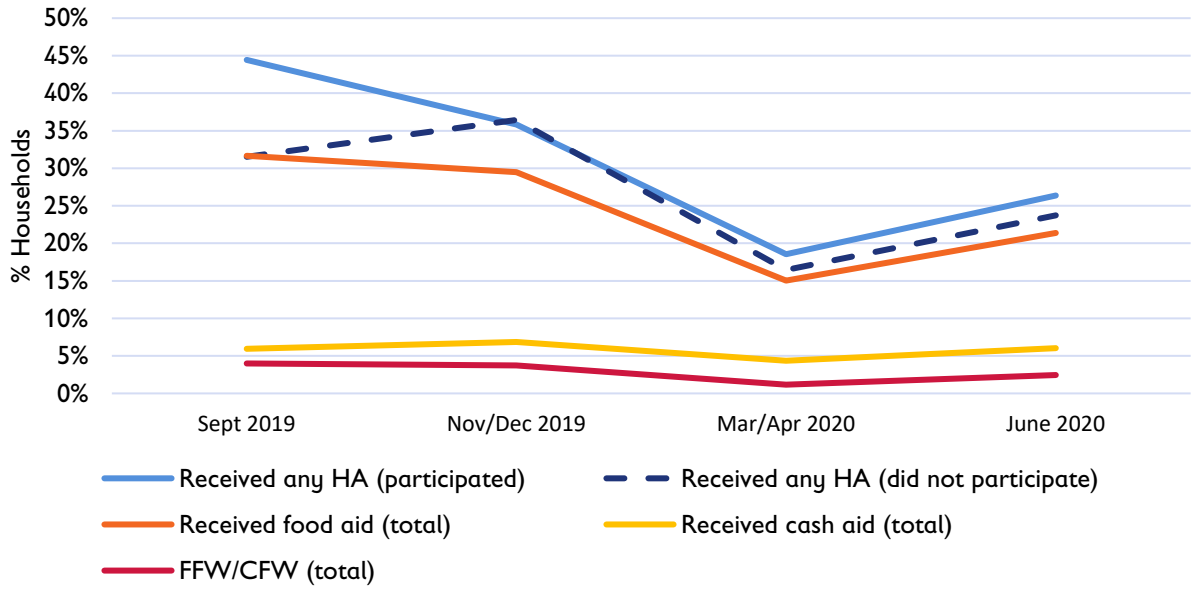
As noted by a KI in Wajir, *"The community members also used to assist each other in constructing houses but since corona started, they stopped assisting each other in the name of observing social distancing in fear of one contracting the disease."*

Humanitarian Assistance

At baseline, receipt of food aid from the government or NGO was more prevalent than cash or Food for Work/Cash for Work (FFW/CFW) as shown in Figure 13. While the lines representing participant and non-participant households show some divergence at baseline, this difference is not statistically significant.

The most common form of assistance across survey rounds was food assistance, while cash and FFW/CFW both remained very low over the course of all survey rounds; less than 10 percent of households received cash assistance or assistance through FFW/CFW initiatives.

Figure 13: Humanitarian assistance received in past three months, by survey round



Qualitative data show that a high number of humanitarian and development organizations are operating in the surveyed counties; KIs named over 40 NGOs working in one or more counties, plus various bilateral and multilateral organizations, and various forms of government assistance. This increases the likelihood that households who were not direct participants in PREG partnership-supported programs receive humanitarian or development support from other sources. It also makes it difficult for respondents to identify who provided specific forms of assistance, and how assistance levels were changing over time.

Sources and forms of assistance reported in KIIs and FGDs across rounds are summarized in Table 16 and Table 17 (Appendix 3). Only a few informants were able to associate specific efforts with PREG-related activities and many had no comment because activities falling under the PREG partnership were not implemented in the area. Most respondents mentioned receiving assistance from specific agencies or NGOs that may or may not be related to the PREG partnership. Therefore, Table 16 is organized by implementing organization to give a sense of the scarcity or intensity of humanitarian and related programming in different counties.

Most FGD participants and KIs stated there were minimal or no changes in humanitarian assistance in their area during the three months prior to each survey round. Beginning in R3 however, there was increased mention of emergency food aid (e.g., in Wajir) and government and FAO assistance to control locust infestation in Wajir and Turkana. Some said these efforts were ineffective or the effort was minimal, as the locust problem persisted and crops were destroyed. Also reported in R3, insecurity stemming from Al-Shabaab terrorists prevented access to some government services in Mandera. In R4, COVID-19 protocols marked the suspension or departure of several NGOs from villages in several areas (e.g., Baringo and Turkana).

> "There were changes resulting from coronavirus: nutrition activities have stopped since the government stay-at-home order, so the nutritionists no longer distribute porridge and Plumpynut to children."
>
> – R4; Turkana

There were some reports of inequity in the distribution of resources and services due to corruption, nepotism, or mismanagement, with resources not reaching the right people. For example, participants in two of the four Isiolo FGDs claimed that food distribution lists were a combination of vulnerable households and others who community leaders added to benefit their own households, relatives and friends; some stated that community leaders demanded bribes from those who wanted to be on the list. Meanwhile FGDs in two other villages in Isiolo reported no outside support in three months.[17]

4.6 FOOD SECURITY OUTCOMES

The main indicator of food security used in this analysis is an experiential indicator of food insecurity, the Food Insecurity Experience Scale (FIES) (Ballard et al. 2014). This indicator is used to measure food security itself as well as *changes* in food security. The FIES is an index constructed

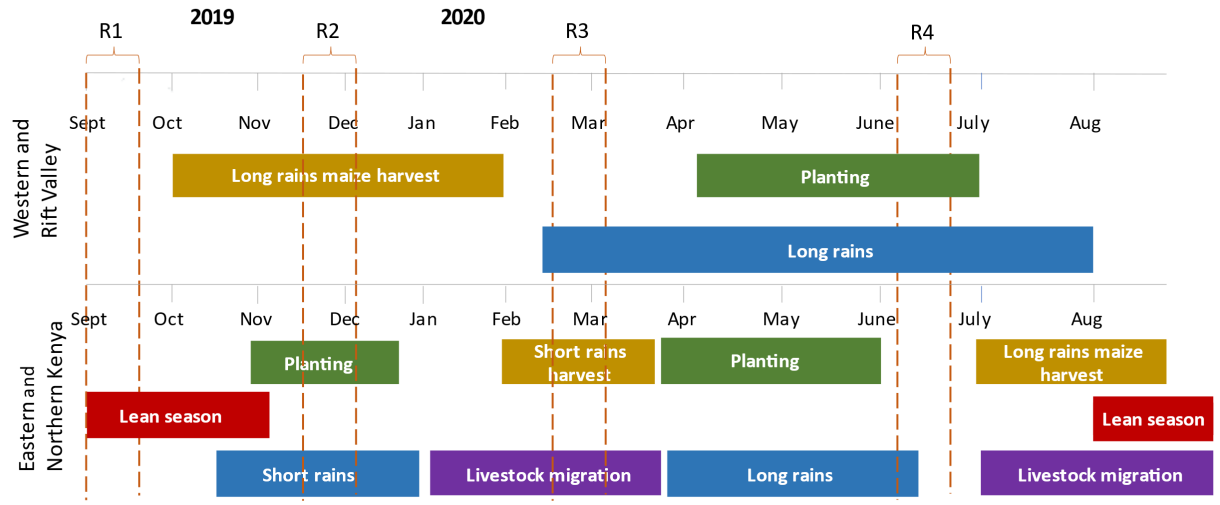
[17] NGO presence changed after devolution, when some villages were classified as urban. As NGOs more commonly focus on rural settings, this meant the loss of NGO support in some rural areas.

from responses to eight questions regarding people's experiences of food insecurity in the 30 days prior to the survey, ranging from worry about not having enough food to actual experiences of food deprivation associated with hunger (See Appendix 4). The FIES can also be used to identify which households can be categorized into a binary variable as *moderately to severely food insecure* or not, defined as experiencing at least four of the eight conditions (or not). Households are classified as *severely food insecure* if it experiences at least seven of the eight conditions.[18]

Household Dietary Diversity is an indicator of dietary quality (Swindale and Bilinsky 2006). It is measured as the total number of food groups, out of 12, from which food was consumed in the previous day.[19]

As context for interpreting food security data, Figure 14 shows the seasonal calendar for Kenya in relation to the four RMS rounds. It bears repeating that data collection for Rounds 3 and 4 occurred in the context of COVID-19.

Figure 14: Kenya seasonal calendar and PREG RMS-1 rounds

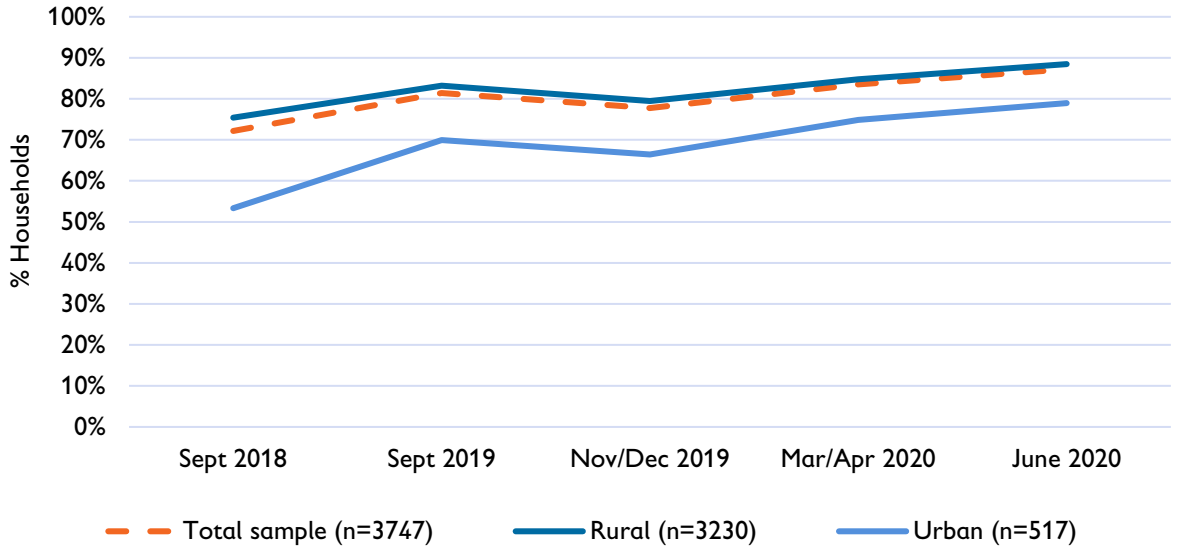


Adapted from: Famine Early Warning Systems Network (FEWS NET). https://fews.net/east-africa/kenya

Figure 15 illustrates food insecurity levels across survey rounds, disaggregated by urban and rural households. The analysis shows high levels of moderate and severe food insecurity overall, with increasing food insecurity over time in both areas. The first peak in food insecurity (September 2019) corresponds to the lean season in eastern and northern Kenya and just prior to the long rains maize harvest in western Kenya and the Rift Valley. After a slight dip at the end of 2019, food insecurity continued to rise through the last survey round.

[18] Thresholds were based on discrete assignment, thus the categories of food security defined as part of this study are not internationally comparable.
[19] The 12 food groups are: cereals; roots and tubers; vegetables; fruits; meat; eggs; fish and seafood; legumes; dairy and dairy products; fats and oils; sweets (sugar, sugar cane, sweet reed/tinksh/ageda or honey); and other foods.

Figure 15: Moderate and severe food insecurity, urban vs rural, by survey round



Household dietary diversity is examined for households that did not participate in any training or group during the RMS period and those that participated in at least one such activity. It is an indicator of dietary quality (Swindale and Bilinsky 2006) and is measured using the Household Dietary Diversity Score (HDDS). The HDDS is the total number of food groups, out of 12, from which food was consumed in the day prior to the survey.[20]

The HDDS remained fairly consistent across survey rounds, at a moderate level of diet diversity (approximately 6.0) (Table 7); thus, there was no observable seasonal trend in dietary diversity, which is contrary to the trend observed in food insecurity. There were no statistically significant differences between households that participated in trainings or groups and those that did not.

Table 7: Household diet diversity, by participation status, by survey round

	Sept 2019	Nov/Dec 2019	Mar/Apr 2020	June 2020	n
Household Dietary Diversity Score (mean)					
Participant	6.0	6.4	6.2	6.2	*570*
Non-participant	5.5	5.8	5.6	5.9	*2355*
Total	5.7	5.9	5.8	5.9	*2925*

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

KEY TAKEAWAYS: RESILIENCE INDICATORS

The overall level of shock exposure reported by households increased in the 2019/20 RMS rounds compared with the 2018 baseline.

Households were exposed to a sequence of different shocks over the course of the RMS rounds:

- Variable rain/drought in September 2019
- Excessive rains/flooding in November/December 2019
- Crop pests in March/April 2020
- Shocks associated with responses to COVID-19 in June 2020—increases in the prices of food and inputs, unemployment for youth

Overall, the utilization of coping strategies increased in the 2019/20 RMS rounds compared with the 2018 baseline, corresponding to increased shock exposure in the RMS rounds relative to the baseline.

Receipt of emergency food aid fell significantly in the third RMS round, March/April 2020. In the following round of June 2020, households reduced food consumption, increased reliance on food and money from family/friends, and receipt of food on credit. Increases in these food coping strategies may be due to reduced access to food aid and response to impacts of COVID-19 during this round.

FGs and Ks indicated that households engaged in various kinds of collective action coping strategies, including self-help savings groups, collective management of rangeland and water resources. Migration in search of grazing land, water, and employment opportunities were also mentioned in focus groups.

Recovery from shocks was generally low over all the RMS rounds. Only recovery from flooding improved significantly in rounds three and four, as exposure to flooding receded.

Among the key components of resilience capacities that were monitored in the RMS surveys, the overall index of household assets and utilization of social capital generally increased from the baseline and over the RMS period, while receipt of formal assistance declined in Rounds 3 and 4. While the overall count of different types of livestock assets increased slightly across rounds, the number of larger livestock, especially goats, decreased.

Confidence to adapt to future shocks was low throughout the RMS rounds. In Round 4, FG participants indicated that COVID-19 negatively impacted people's confidence. FGs and KIs also indicated that confidence to adapt to shocks is very dependent on community- and system-level investments in transport and water sources.

Tracking the high level of shock exposure and sequence of shocks that occurred over the four rounds, food insecurity increased substantially compared to baseline and continued to increase over the four RMS rounds.

5 PROJECT PARTICIPATION, RESILIENCE CAPACITIES, AND RESILIENCE OUTCOMES

For USAID, resilience is "the ability of people, households, communities, countries, and systems to mitigate, adapt to, and recover from shocks and stresses in a manner that reduces chronic vulnerability and facilitates inclusive growth" (USAID, 2013). Within the resilience measurement framework we consider resilience itself as an ability to maintain food security in the face of shocks (resilience outcomes), while resilience capacities are a set of conditions, attributes, or skills that enable households to achieve resilience. This section examines the role of households' resilience capacities in strengthening their resilience to shocks, as measured in the RMS.

Given their complexity, measuring the three dimensions of resilience capacity (absorptive, adaptive, and transformative) requires use of factor analysis to combine multiple indicators into indices of the three capacities as well as an overall index of resilience capacity. These data were collected in the baseline survey. A full list of resilience capacity indicators collected at baseline is presented in Appendix 5. The baseline values used in this analysis are those from August 2018, that is, 12 months before the start of RMS 2019–20.[21] The RMS survey collected information about several key resilience capacity indicators over each round: asset indicators (livestock assets measured in Tropical Livestock Units (TLU), and the total number of different types of assets owned by the household), social capital (assistance received from others and assistance provided to others), and humanitarian assistance received. Appendix 7 presents results for resilience capacity indicators by participation status.

The regression models presented below examine the relationships of these baseline and current resilience capacities on several resilience outcome indicators: household food insecurity levels, changes in realized resilience (round-to round changes in household food security levels), perceived resilience (reported ability to cope with future shocks). These models also include shock exposure and participation in resilience programming as key explanatory variables. Shock exposure has the expected impact of increasing food insecurity and reducing perceived resilience. With the exception of the perceived resilience model, program participation was not a significant explanatory factor. However, the impact of resilience programming is likely to have an indirect impact on the outcomes through several causal pathways. Two instrumental variable models are used to further explore the ways in which resilience programming indirectly impacts food security outcomes and households' perceived resilience to future shocks by increasing household assets. Full regression results for the various models are presented in Appendix 8.

5.1 FOOD INSECURITY LEVELS MODEL

This section presents results from regressions exploring the relationship between levels of food insecurity, shock exposure, resilience capacity, and program participation. The dependent variable

[21] Calculation of resilience indicators can be found in https://www.fsnnetwork.org/sites/default/files/Methodology_Guide_Nov2018508.pdf

is food insecurity as measured by the FIES.[22] Higher FIES scores (range: 0–8) correspond to higher observed levels of self-reported food insecurity. The FIES scores are tabulated into a scale that categorizes food security status as food secure to mild food insecurity (score: 0–3), moderate food insecurity (score: 4–7) or severe moderate food insecurity (score: 8).[23] As a point of reference: the observed median FIES score in households surveyed during the RMS period is 7, which is near the cutoff between moderately and severely food insecure.

The key explanatory variables, i.e., variables that are expected to explain differences in food insecurity, used in the analyses are:

- Cumulative[24] shock exposure (expected to increase food insecurity);
- Values of resilience capacity indexes measured at the time of the baseline survey (expected to reduce food insecurity);
- Receipt of humanitarian assistance over the RMS period (expected to be associated with either higher or lower levels of food insecurity);
- Values of asset indicators measured over the RMS period (expected to be associated with lower levels of food insecurity); and
- Utilization of social capital over the RMS period (providing assistance expected to be associated with lower food insecurity, receiving assistance expected to be associated with higher food insecurity).
- Participation in resilience activities

All regressions also include a basic set of socioeconomic and geographic variables meant to control for differences in underlying demographic and socioeconomic conditions (e.g., age, gender distribution of household members), unobserved fixed effects across different geographies (e.g., counties), and unobserved effects related to time (e.g., survey round), the results of which are not reported here.

Table 8 summarizes the estimation results based on regression specifications that focus on baseline resilience capacity indexes as the key explanatory variables of interest. The rows show all explanatory variables included in the regression models. The columns represent different models in which some explanatory variables were excluded. Excluded variables are shaded in grey; empty cells without shading indicate that there is no statistically significant relationship between the explanatory variable and food insecurity.

Separate models were estimated with different specifications of household resilience capacities measured in the baseline survey round: an overall resilience capacity index that includes all three types of resilience capacity (i), absorptive capacity (ii), adaptive capacity (iii), and transformative

[22] Described in Section 3.6.
[23] FAO. 2019. The Food Insecurity Experience Scale. http://www.fao.org/in-action/voices-of-the-hungry/fies/en/ accessed 7 January 2019.
[24] Shock exposure index added together across rounds

capacity (iv). We also estimate a model that includes project participation as an explanatory variable (v). The equations were run in a stepwise fashion in order to show the isolated effects of the key variables of interest, namely total resilience, absorptive, adaptive, and transformative capacities, as well as, participation in activities.

Table 8: Coefficient signs and significance for moderate/ severe food insecurity

Explanatory variable	Moderate / severe food insecurity (FIES raw score, range: 0–8)				
	(i)	(ii)	(iii)	(iv)	(v)
Farming as a livelihood (BL)	(+)*		(+)**		(+)*
Livestock production as a livelihood (BL)					
Improved water (BL)	(-)**	(-)**	(-)**	(-)**	(-)**
Improved sanitation (BL)	(-)**	(-)*	(-)**	(-)**	(-)**
Urban (BL)					
Cumulative index of shock exposure (t)	(+)***	(+)***	(+)***	(+)***	(+)***
HH gave assistance to others (t)					
HH received assistance from others (t)	(+)***	(+)***	(+)***	(+)***	(+)***
HH received humanitarian assistance (t)					
Livestock assets—TLU (t)	(-)***	(-)***	(-)***	(-)***	(-)***
Total asset index (t)	(-)***	(-)***	(-)***	(-)***	(-)***
Resilience capacity index (BL)	(-)*				
Absorptive capacity index (BL)		(-)***			
Adaptive capacity index (BL)			(-)***		
Transformative capacity index (BL)					
Participation (cumulative # of activities) (t)					

Significance level of explanatory variable: *p<0.1 ** p<0.05 ***p<0.01 ns not significant
(+) variable is positively related to food insecurity; (-) variable is inversely related to food insecurity
(BL) measured at baseline; (t) measured in the current time period

Key socio-economic controls in our model that contribute to lower food insecurity (i.e., better food security) include access to an improved water source and access to improved sanitation. Higher asset levels, as represented by the total asset index score[25] and TLUs,[26] are also associated with better food security. According to results from these models, farming as a livelihood source is associated with greater food insecurity, as is cumulative shock exposure.

Baseline overall resilience, absorptive, and adaptive capacity levels are found to be significantly associated with lower levels of food insecurity over the RMS period. Baseline transformative capacity did not exhibit any significant relationship with food insecurity measured during the RMS rounds.

The next three figures provide a visualization of the relationships between important explanatory variables and the level of food insecurity as measured by FIES. Figure 16 shows how levels of food

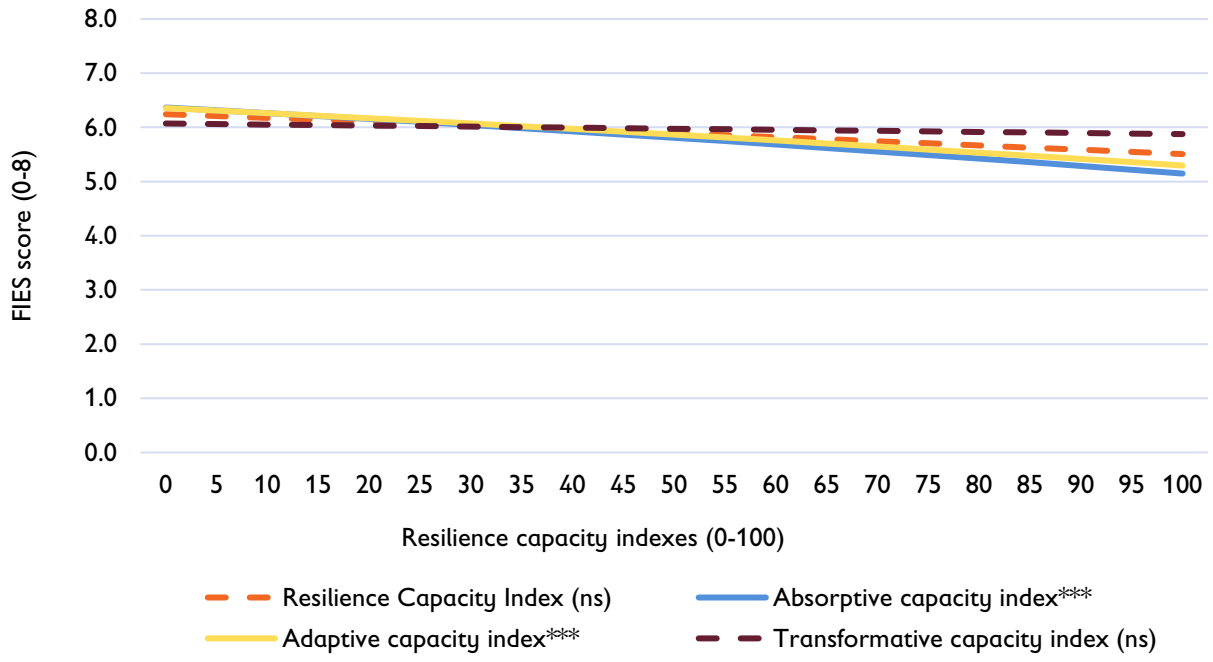
[25] The total asset score represents the diversity of household, productive, and livestock assets; a higher score indicates higher asset diversity. See detailed description in Sec 3.6 Asset Ownership.
[26] TLUs represent total livestock ownership. See detailed description in Sec 3.6 Asset Ownership.

insecurity predicted by the regression model change with varying levels of resilience capacity (while holding all other variables fixed at their mean values).

As indicated by the signs of the coefficients in Table 8, households with higher levels of absorptive and adaptive resilience capacities at baseline experienced lower levels of food insecurity in the RMS rounds, holding all other factors constant. However, the magnitudes of these relationships (as measured by the slopes of the lines) are not very large. For example, a large increase in baseline absorptive capacity index values from 15 to 55[27] predicts a reduction in the level of FIES score from 6.2 to 5.7 (or 8 percent). Thus, a large increase in absorptive (or adaptive) capacity confers a somewhat small—though potentially meaningful—improvement in food security. Neither transformative capacity nor the overall resilience-capacity index coefficients are significantly different from zero.

It is important to remember that these models are measuring the relationships between household resilience capacity indexes as measured in the baseline survey, with changes in food security measured in the RMS rounds, one year or longer after the baseline. The long lag in time between measuring resilience capacity indexes at baseline and measuring food security outcomes in the RMS rounds may explain why the measured relationships are quite weak.

Figure 16: Effects of baseline resilience capacity indexes on food insecurity



Significance level of explanatory variable: *p<0.1 ** p<0.05 ***p<0.01 ns not significant
Note: FIES; 0-3 food secure; 4-7 moderately food insecure; >7 severely food insecure

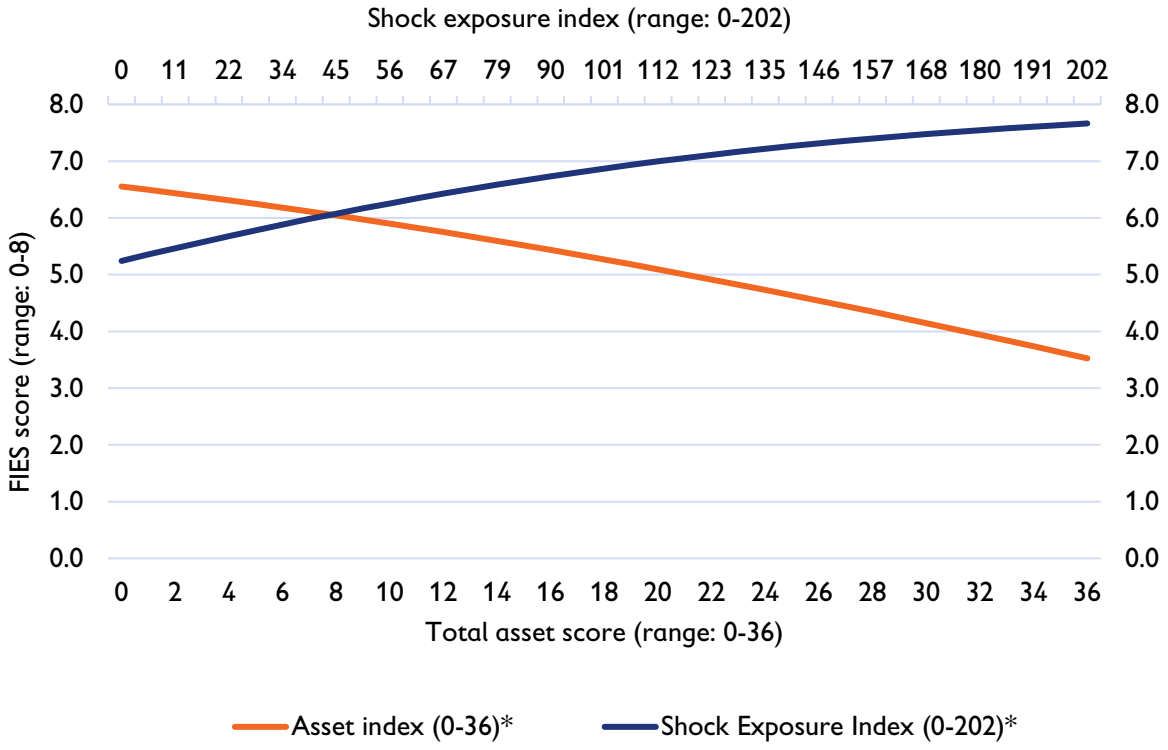
Two explanatory variables that demonstrate larger effects on food security are cumulative exposure to shocks experienced by households during the RMS period and levels of total assets (Figure 17). As noted in Table 8, cumulative shock exposure is strongly associated with higher

[27] Corresponds with the 10th and 90th percentile of the observed distribution.

levels of food insecurity. As shock exposure increases from 0 (FIES = 5.2) to the mean value (43) of the cumulative shock exposure index (FIE S= 6.1) and ultimately to a value of 118 (FIES = 7.1), food security worsens, from moderate to severe food insecurity. A shock exposure index score of zero implies no exposure to any shock at any time in the period the RMS surveys were implemented. The mean value (43) implies exposure to one severe shock and exposure to a shock that was not quite as severe over the whole RMS period. Finally, a value of 118 implies exposure to two severe shocks and four to five less severe shocks over the RMS period.

Likewise, an increase in types of assets owned reflects improvement in food security. For example, an increase from four to thirteen types of assets owned[28] is associated with a reduction in the predicted FIES score from 6.4 to 5.7, though still within the moderately food insecure range. As households gain types of assets, the predicted FIES score approaches and eventually falls below 4, entering the range of food security. The magnitude of the effect of asset ownership on predicted levels of food security is quite strong and implies that efforts made to enable households to maintain (or grow) their assets in the face of shock(s) should translate to improved household food security.

Figure 17: Effects of shock exposure and total assets on food insecurity



Significance level of explanatory variable: *p<0.1 ** p<0.05 ***p<0.01 ns not significant
Note: FIES; 0-3 food secure; 4-7 moderately food insecure; >7 severely food insecure

Apart from food security, shock exposure, and types of assets, the RMS also collected information about additional key resilience capacities and participation in groups and/or trainings. Figure 18

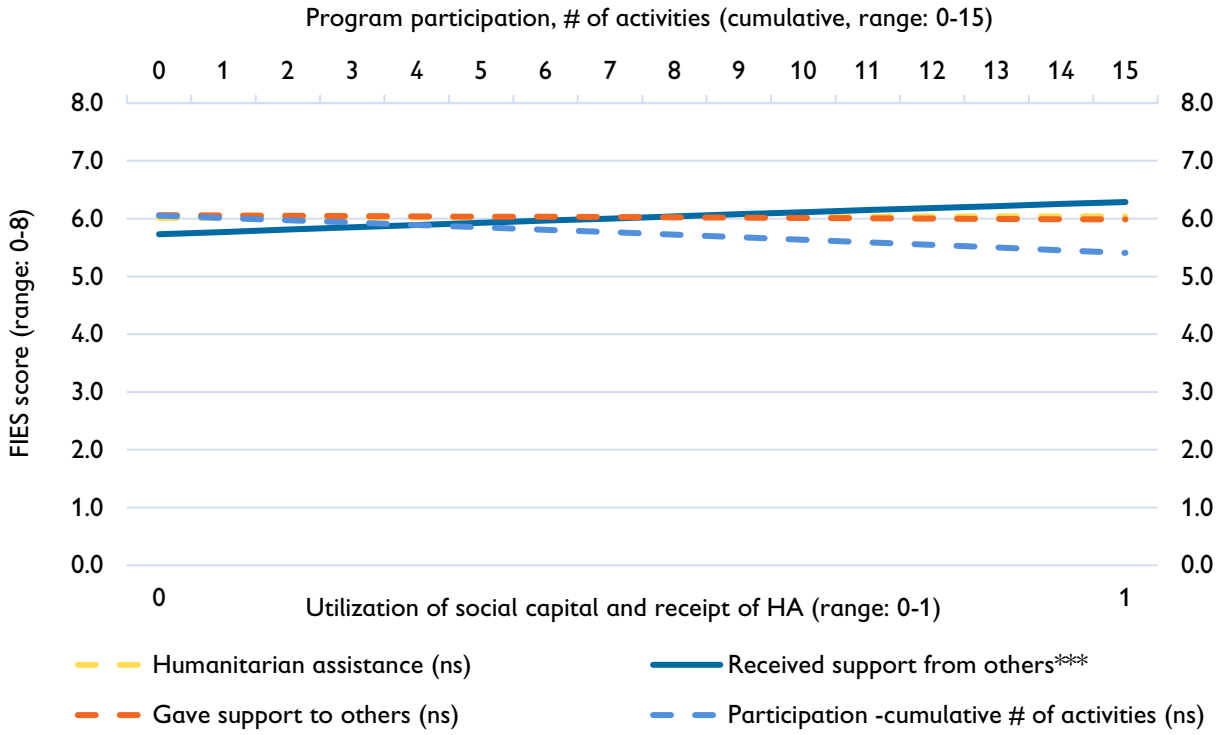
[28] 10th and 90th percentile, respectively.

shows the predicted values of food insecurity plotted on the y-axis with values of the explanatory variables plotted from their respective minimum to maximum values on the x-axis.

The effect of social capital (giving help to others), receipt of HA, and program participation on predicted food insecurity are negligible. The only effect on predicted food insecurity that is statistically different from zero is for receiving help from others.

Holding all other variables in the model constant (at their mean values), households that reported receiving help from others ("1") are predicted to have worse food security (FIES = 6.3) than those households that did not report receiving help from others ("0"; FIES = 5.7). This indicates that households who receive assistance from others are more likely to have higher levels of food insecurity, although the magnitude of this relationship is not particularly strong. Notably, approximately one-half of surveyed households reported receiving support from others during the period of RMS surveys, while less than one-third reported receiving formal assistance (see Figure 13). This suggests that families and friends helped fill a gap between need and availability of formal assistance, but it was not sufficient to help households maintain or improve their level of food security.

Figure 18: Effects of social capital, humanitarian assistance, and participation on food insecurity



Significance level of explanatory variable: *p<0.1 ** p<0.05 ***p<0.01 ns not significant
Note: FIES; 0-3 food secure; 4-7 moderately food insecure; >7 severely food insecure

The principal measure of participation used in all of the regression analyses is a cumulative measure of participation across RMS rounds. Please see Appendix 6 for an example of how this measure is calculated. In this model, cumulative program participation did not have an observed effect (positive or negative) on food insecurity. However, a model that excludes *total asset score*

results in a significant inverse effect of program participation on food insecurity (i.e., more program participation implies lower food insecurity). This is due to a strong relationship (high degree of correlation) between program participation and assets. There is some potential uncertainty related to the direction of causality between assets and participation. In an effort to address this issue, the models control for the baseline level of resilience capacity and baseline livestock ownership, which are correlated with baseline assets. In addition, the cumulative participation measure used predetermines the total asset index measured at the time of survey (i.e. the variable includes information related to lagged participation and participation in interventions in the three months prior to the survey). The relationship between program participation, asset level, and food security is further explored in Section 5.4 (Food Insecurity Instrumental Variable model). We recommend exploring the issues related to direction of causality between participation and assets in later rounds of the evaluation, particularly in the qualitative components.

5.2 REALIZED RESILIENCE MODEL

This section explores the relationship between realized resilience, shock exposure, resilience capacity, and program participation. Realized resilience is the change in food security (i.e., FIES) between each of the RMS rounds.[29] Changes in the FIES score that are less than or equal to zero represent "realized resilience," or the ability of a household to maintain or improve its food security.

The change in the FIES scores between rounds ranges from -8 to +8 with a mean value of 0.07. Positive values associated with the change in FIES indicate that household food security is deteriorating (i.e., food insecurity is increasing) while negative values indicate that household food security is improving (i.e., food insecurity is declining). Further, the measure should be considered as "short-term" realized resilience given that the changes in food security are measured over relatively short intervals of three months.

As previously described, key explanatory variables include baseline levels of resilience capacity, and receipt of humanitarian assistance, utilization of social capital, cumulative shock exposure, and assets[30] measured over the RMS period. The same controls for socioeconomic conditions, county fixed effects, and survey rounds were applied here. One key variable used in the regression model presented in this section that was not included in the previous regression model is the lagged value of FIES (i.e., $FIES_{(t-1)}$).[31]

In general, the results presented for this model are consistent with those presented in the previous model (i.e., dependent variable = level of food insecurity) although realized resilience is not as frequently associated across rounds with socio-economic controls and most of the resilience capacity indices. However, negative changes in food insecurity (i.e., improved food security) are

[29] Realized resilience = $FIES_t$–$FIES_{t-1}$, where t represents the current time period or RMS round and t-1 reflects the previous time period.
[30] The analysis uses lagged values (i.e., values from the previous time period) of the total asset score and TLU to ensure these variables precede the dependent variable (i.e., to accurately measure the change in food security between the current period and previous period).
[31] The analysis finds that the lagged values of FIES are always statistically significant and inversely related to changes in FIES. This implies a "regression-to-mean" effect in which outlier levels of FIES tend to revert to the mean over time.

associated with improved sanitation and are strongly related to cumulative shock exposure and total assets from the previous survey round.

Baseline absorptive capacity (ii) is the only measure of resilience capacity found to be significantly associated with improvements in food security (i.e., a negative change in FIES) over the RMS period. These results suggest that only absorptive capacity contributes to short-term (i.e., intra-year) improvements in food security, while results from the previous model (i.e., level of food security) demonstrate that both absorptive and adaptive capacity contribute to better food security at a given point in time. These results indicate that absorptive capacity, as measured by the index, promotes the ability of households to cope with shocks and stresses in the short term, as predicted by the conceptual framework. Adaptive capacities build resilience over the longer term, which we would expect to be more strongly related with longer-term changes in food security in the face of shock and stress.

Table 9: Coefficient signs and significance for changes in moderate/ severe food insecurity

Explanatory variable	Dependent variable: Changes in moderate / severe food insecurity (FIES score)				
	(i)	(ii)	(iii)	(iv)	(v)
Farming as a livelihood (BL)					
Livestock production as a livelihood (BL)					
Improved water (BL)				(-)*	
Improved sanitation (BL)	(-)*		(-)*	(-)**	(-)*
Urban (BL)					
Cumulative index of shock exposure (t)	(+)***	(+)***	(+)***	(+)***	(+)***
HH gave assistance to others (t)	(-)***	(-)**	(-)***	(-)***	(-)***
HH received assistance from others (t)	(+)***	(+)***	(+)***	(+)***	(+)***
HH received humanitarian assistance (t)					
Livestock assets—TLU (t-1)					
Total asset index (t-1)	(-)***	(-)***	(-)***	(-)***	(-)***
Resilience capacity index (BL)					
Absorptive capacity index (BL)		(-)**			
Adaptive capacity index (BL)					
Transformative capacity index (BL)					
Participation (cum # of activities) (t)					

Significance level of explanatory variable: *p<0.1 ** p<0.05 ***p<0.01 ns not significant
(+) variable is positively related to food insecurity; (-) variable is inversely related to food insecurity
(BL) measured at baseline; (t) measured in the current time period; (t-1) value is from the previous time period

Figure 19 shows the relationship between the resilience capacity indexes and changes in food insecurity; only absorptive capacity is significantly related to changes in food insecurity (see also Table 9); increasing absorptive capacity is associated with a negative change in the FIES, or decreased food insecurity, though the strength of the relationship (slope) is relatively modest. Large increases in absorptive capacity result in modest, though potentially important, improvements in food security.

Figure 19: Effects of baseline resilience capacities on changes in food insecurity

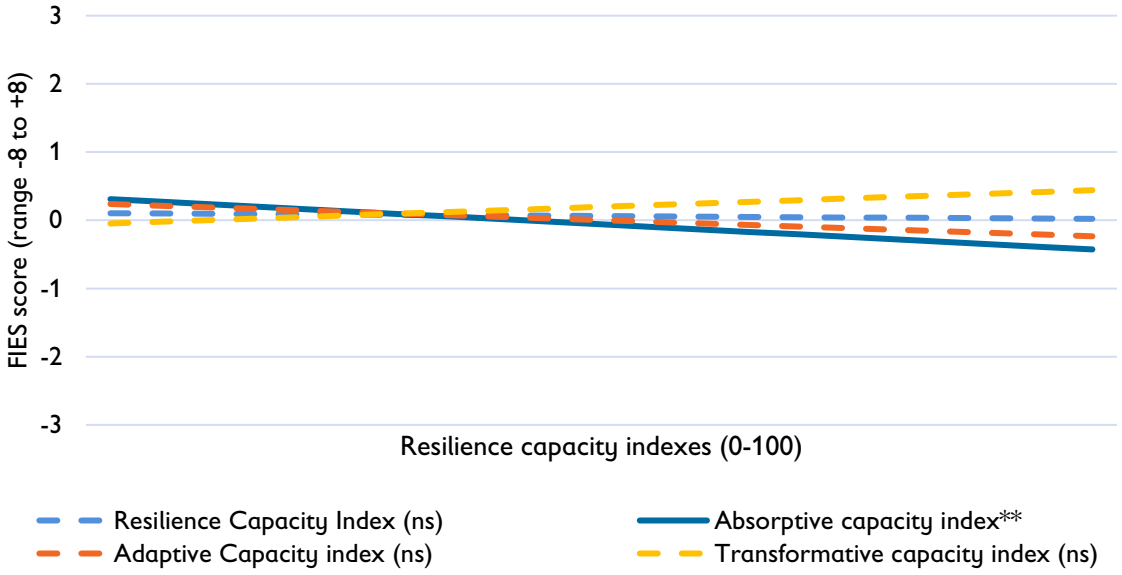
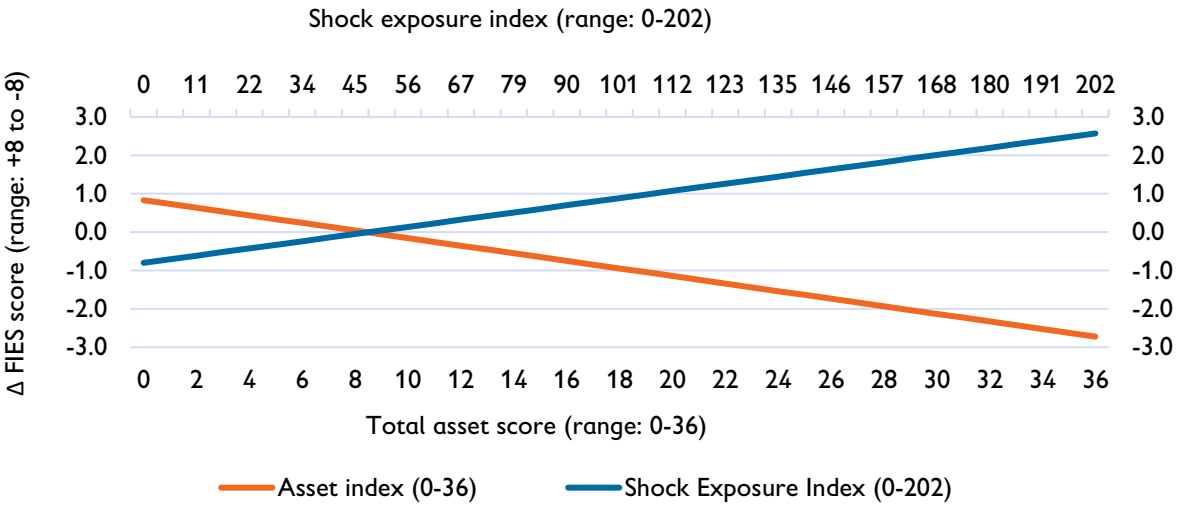


Figure 20 shows the strength of the relationships between i) change in food insecurity and cumulative shock exposure and ii) change in food insecurity and total assets. The change in food insecurity predicted by our model when households have no shock exposure is -0.8, which represents a meaningful decrease in food insecurity between the two rounds measured (i.e., improvements in short-term food security). As shock exposure increases, changes in food insecurity become more positive (i.e., worsening short-term food security).

Figure 20: The effects of shock exposure and total assets on changes in food security



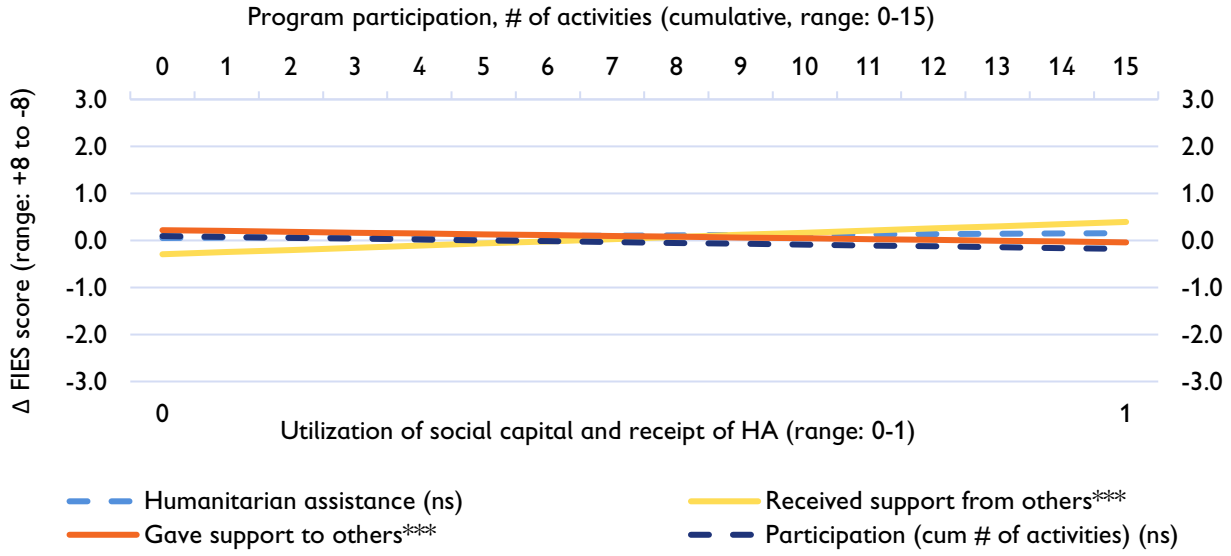
Significance level of explanatory variable: *p<0.1; ** p<0.05; ***p<0.01; ns not significant

The predicted change in food insecurity of households who own no assets is +0.8, a meaningful deterioration in food security along the FIES scale. As households increase their total asset levels, food security improves (changes in FIES become more negative). Again, the strong relationship

between a household's total assets and their food security underscores the importance of assets to household capacity for dealing with shocks and stressors.

Figure 21 shows the estimated effects of utilization of social capital, receipt of humanitarian assistance, and participation in groups and/or trainings on predicted changes in food insecurity. Both giving help to others and/or receiving help from others have statistically significant effects on changes in food security, though in different ways. Those that received support (1) show a modest deterioration in food security (change in FIES = +0.4). In contrast, households that did not report receiving support from others (0) show slightly improved food security (change in FIES = –0.3). Receipt of humanitarian assistance and participation in groups and/or trainings were not statistically related to changes in food insecurity.

Figure 21: Effects of social capital, humanitarian assistance, and participation on changes in food insecurity



5.3 PERCEIVED RESILIENCE MODEL

Another important measure of household resilience to shock and stress collected as part of the RMS was households' confidence to adapt to future shocks.[32] Regression results presented in this section utilize a *"Perceived Resilience"* model specifying confidence to adapt as an ordinal dependent variable that ranges from 1 to 5, where higher values represent higher confidence. As with the previous two regression models presented, a standard set of socio-economic and fixed-effect controls were consistently employed along with time-variant resilience capacities and cumulative shock exposure. Separate equations (identified in Table 10 as (i), (ii), (iii), (iv), and (v)) are utilized that focus on key explanatory variables, namely, baseline resilience capacity indexes and program participation. The measure of program participation reported for this model is a count of the

[32] Described in Section 3.4.

number of groups and/or trainings in which a household participated over the prior three-month period, in contrast to a cumulative measure of participation.[33]

Livestock production as a livelihood is negatively associated with confidence to adapt (Table 10) and suggests that livestock producers in the RMS sample have lower confidence in their ability to adapt to future shocks compared to those that did not report livestock production as a livelihood. However, *total livestock assets* (measured by TLUs) is positively related to confidence to adapt in several of the equations (i, iv, v).

Similar to the realized resilience model, the total asset index and households that reported providing support to others are strongly related to confidence to adapt to future shocks. In a significant departure from the two previous food security models, baseline resilience capacity (in all forms), and participation in groups/trainings over the previous three months are significantly and positively related to confidence to adapt while cumulative shock exposure has no apparent direct relationship.

Table 10: Coefficient signs and significance for confidence to adapt to future shocks

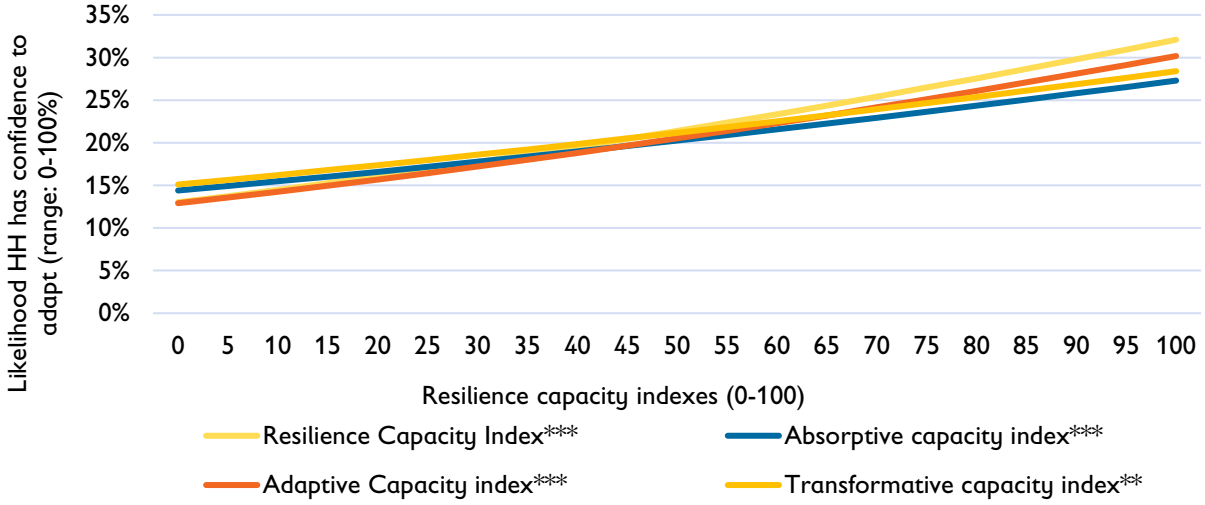
Explanatory variable	Dependent variable: Confidence to adapt to future shocks (range: 1-5)				
	(i)	(ii)	(iii)	(iv)	(v)
Farming as a livelihood (BL)					
Livestock production as a livelihood (BL)	(-)***	(-)***	(-)***	(-)***	(-)***
Improved water (BL)					
Improved sanitation (BL)					
Urban (BL)					
Cumulative index of shock exposure (t)					
HH gave assistance to others (t)	(+)***	(+)***	(+)***	(+)***	(+)***
HH received assistance from others (t)					
HH received humanitarian assistance (t)					
Livestock assets—TLU (t)	(+)*			(+)*	(+)*
Total asset index (t)	(+)***	(+)***	(+)***	(+)***	(+)***
Resilience capacity index (BL)	(+)***				(+)***
Absorptive capacity index (BL)		(+)***			
Adaptive capacity index (BL)			(+)***		
Transformative capacity index (BL)				(+)**	
Program participation (count of activities) (t)					(+)***

Significance level of explanatory variable: *p<0.1 ** p<0.05 ***p<0.01 ns not significant
(+) variable is positively related to food insecurity; (-) variable is inversely related to food insecurity
(BL) measured at baseline; (t) measured in the current time period; (t-1) value is from the previous time period

[33] Various measures of participation, including participation within the past three months, cumulative participation over the RMS, and a binary measure of participation ("any participation at any point during the RMS rounds") were tested in all models. The preferred measure is cumulative participation, as it captures both a quantity and time component; however, this model reports the measure of participation over the prior three months as it was statistically related to confidence to adapt while the cumulative participation was not. ***so what's the implication of this? That any effect of participation on confidence is short-lived?

Figure 22 demonstrates the strength of the relationship between baseline resilience capacities and confidence to adapt. The overall resilience capacity index has the strongest relationship while transformative capacity has the weakest, represented visually by the slopes of the respective lines.

Figure 22: Effects of independent variables on confidence to adapt

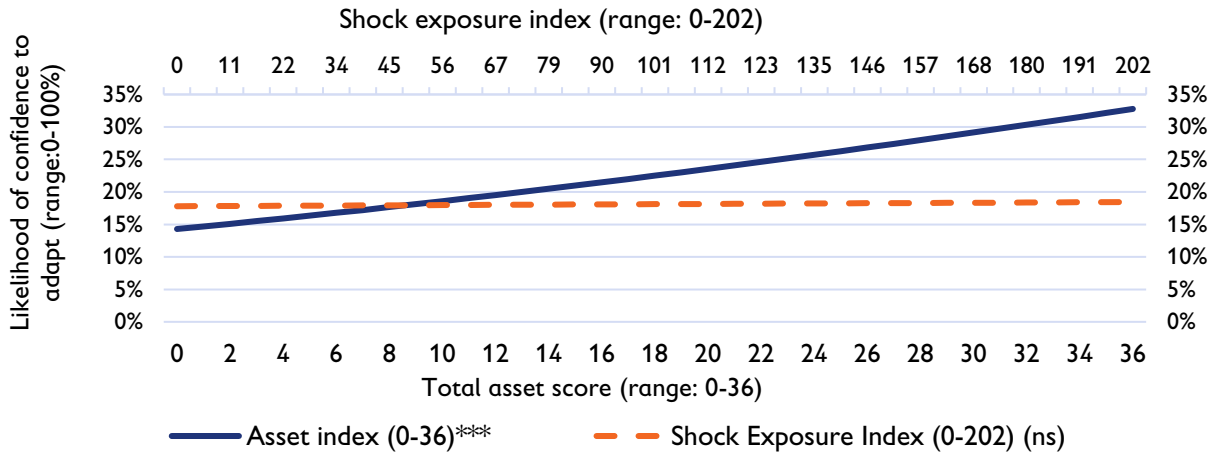


Significance level of explanatory variable: *p<0.1; ** p<0.05; ***p<0.01; ns not significant

As in the previous models, total assets display a strong positive relationship with better outcomes, in this case, confidence to adapt to future shocks (Figure 23). This implies that household confidence to adapt to future shocks is bolstered not just by assets itself a resilience capacity, but by the combined set of complementary resilience capacities comprising the resilience capacity indexes.

Despite the strong negative effect that shock exposure exhibited on levels of food security and short-term changes in food security, the lack of observed relationship between shock exposure and confidence to adapt might suggest that households do not expect the shocks they experienced during the RMS to persist or recur as frequently in the future.

Figure 23: Effects of shock exposure and total asset score in confidence to adapt

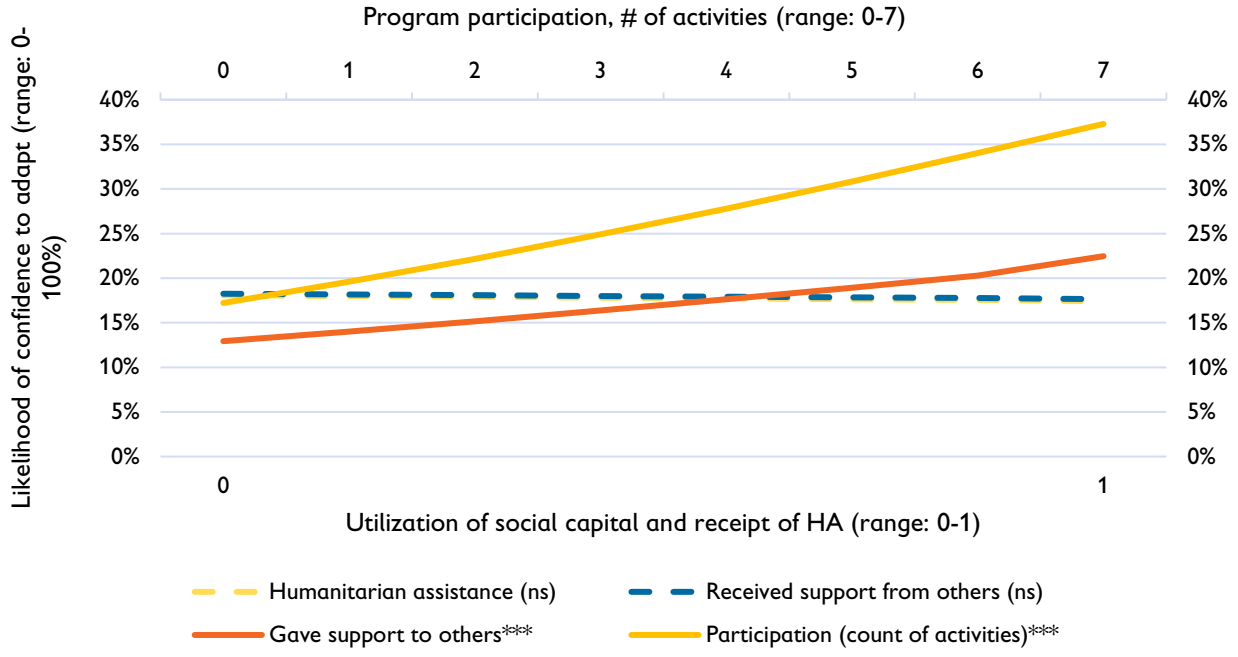


Significance level of explanatory variable: *p<0.1; ** p<0.05; ***p<0.01; ns not significant

Figure 24 shows the estimated effects of utilization of social capital, receipt of humanitarian assistance, and participation in groups/trainings in the previous three months on confidence to adapt. Giving support to others and participation in groups/trainings in the previous 3-month period are both strongly related to confidence to adapt. In contrast, receiving support from others and receipt of humanitarian assistance are not statistically related to confidence to adapt.

Households that reported giving support to others (1) are more likely to have confidence compared to households that did not report giving help to others (0). Participation in groups/trainings in the previous three months exhibits an even stronger effect (slope of the line) on likelihood of confidence to adapt. The fact that recent participation is strongly related to confidence to adapt while cumulative participation is not may suggest that participation in short-term, intensively layered interventions is what provides a boost to confidence to adapt rather than repeated more long-term participation. This is a subject that warrants further exploration in future PREG II surveys, with improved participation measures.

Figure 24: Effects of social capital, humanitarian assistance, and participation in the months prior to a survey on confidence to adapt



Significance level of explanatory variable: *p<0.1 ** p<0.05 ***p<0.01 ns not significant

5.4 FOOD INSECURITY LEVELS: INSTRUMENTAL VARIABLE MODEL[34]

Building on results presented in Section 5.1, this section presents regression results from models that more explicitly explore the relationship between food insecurity, assets, and participation in

[34] We ran the IV model using both short-term realized resilience and food insecurity level as the second-stage dependent variables. An issue with using participation as an instrument for assets with change in food security as the second-stage DV is that the instrumented assets measure is correlated with lagged food insecurity (i.e. instrumented assets is not significant in the second-stage equation due to the multi-collinearity with lagged food security. Given that modeling complication, we chose to use levels of food security in the IV model.

the face of shock exposure. Instrumental variable techniques are used here to simultaneously solve two related equations that are represented as follows:

1. Total asset score is principally determined by participation in groups or participation in trainings.

2. The level of food insecurity is determined by total assets (which are determined by participation in groups/trainings).

The dependent variable in the principal equation (2) is the FIES score. The dependent variable in the first-stage equation (1) is the total asset score. In order for this technique to be properly specified, or "identified", a subset of explanatory variables (i.e., instrumental variables) must be included in equation (1) that are correlated with total assets, with the caveat that this same subset of explanatory variables is not directly correlated with food insecurity. As noted in Section 5.1, evidence was discovered during the initial modeling of the level of food insecurity equations that participation in groups or in trainings could qualify as valid instruments in this type of regression model, the practical implication being that total asset levels serve as an important mediating factor between program participation and higher levels of food security.

Table 11 shows regression results for both the first-stage (dependent variable = total asset score) and second-stage (dependent variable = level of food insecurity) equations. A number of variables are significantly related to higher total assets, including households that report engaging in farming as a livelihood, access to improved water and sanitation, households residing in urban areas, livestock assets from the previous survey round, and notably, baseline levels of resilience capacity. Most importantly, cumulative participation in groups and cumulative participation in trainings exhibit a strong relationship with total assets, even when controlling for all of these other factors.

The second-stage results clearly demonstrate that predicted total assets (determined by participation in trainings or in groups), is strongly related to *lower* levels of food insecurity when controlling for other factors, in particular, cumulative shock exposure which is strongly related to *higher* levels of food insecurity.

Table 11: Coefficient signs and significance for IV model: program participation, assets, and food security

Explanatory Variable	"First-stage"	"Second-stage"
	DV: Total asset score	DV: Level of food insecurity (FIES score)
Farming as a livelihood (BL)	(+)**	(+)*
Livestock production as a livelihood (BL)		
Improved water (BL)	(+)*	
Improved sanitation (BL)		(-)*
Urban (BL)	(+)**	
Cumulative index of shock exposure (t)		(+)***
HH gave assistance to others (t)	(+)***	
HH received assistance from others (t)		(+)***

Explanatory Variable	"First-stage"	"Second-stage"
	DV: Total asset score	DV: Level of food insecurity (FIES score)
HH received humanitarian assistance (t)		
Livestock assets (TLU, t-1)	(+)***	
Resilience capacity index (BL)	(+)***	
Cumulative participation in groups (count) (t)	(+)***	
Cumulative participation in training (count) (t)	(+)***	
Total asset score (t)		(-)***

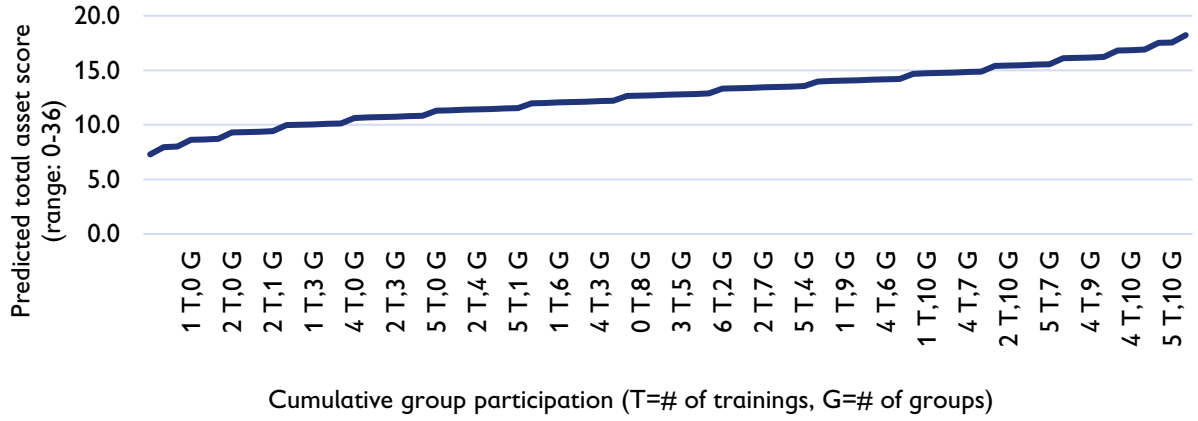
Significance level of explanatory variable: *p<0.1 ** p<0.05 ***p<0.01 ns not significant
(+) variable is positively related to food insecurity; (-) variable is inversely related to food insecurity
(BL) measured at baseline; (t) measured in the current time period; (t-1) value is from the previous time period

The cumulative participation measures capture the intensity of participation through both a "quantity" component (i.e., increases directly with the number of groups and/or trainings that a household participates in), as well as, a "time" component (i.e., increases even more as households participate in groups/training for greater lengths of time). An example of how these components are measured is presented in Appendix 6.

The strength of the relationship between participation in groups and trainings, and the implied levels of assets predicted by the instrumental variables model at different levels of participation is presented in Figure 25. Cumulative participation in combinations of numbers of groups and trainings is shown on the horizontal axis and increases moving from left to right.

Households that do not participate in any groups or trainings at any point in the RMS rounds have a predicted asset score of 7 (Figure 25). Plotting the predicted values of assets across increasing measures of participation demonstrates the strength of the relationship between participation in groups/trainings and total assets, and the degree to which higher participation is expected to lead to higher levels of assets.[35]

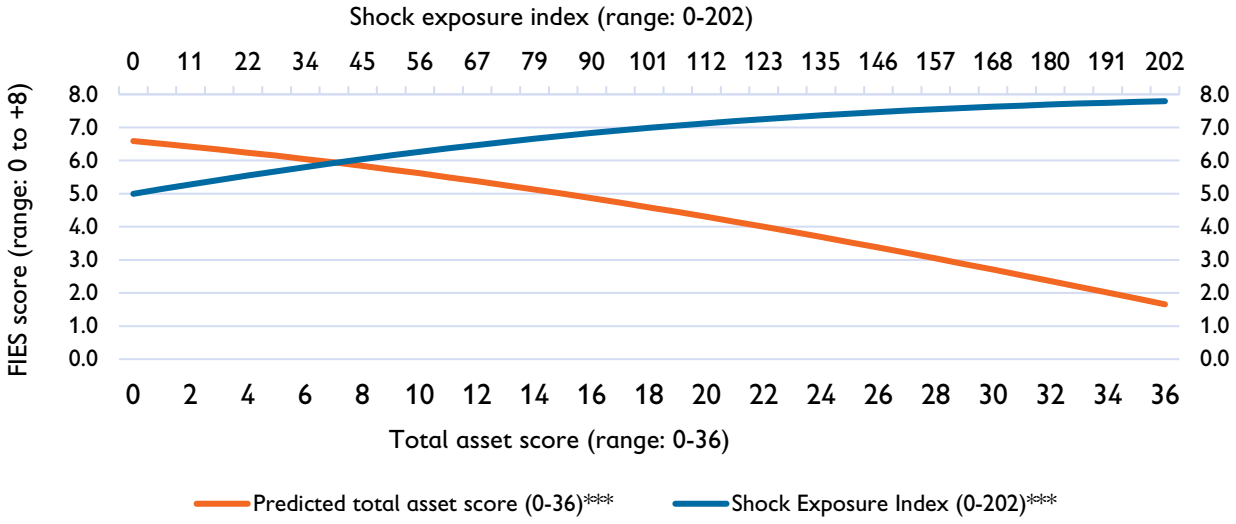
Figure 25: Predicted assets (first-stage assets predicted by changes in cumulative participation)



[35] It is possible that the direction of causality is contrary to our hypothesis, namely, higher asset levels lead to higher participation in groups and trainings, rather than vice-versa. However, note that the asset index is measured at the time of survey while the cumulative participation measures represent participation in the three months prior to the survey. We also tested this IV model with the baseline level of assets as an additional explanatory variable and the results did not change compared to those presented in this report. This result (controlling for baseline assets) supports the hypothesis that participation is driving higher asset levels.

Figure 26 shows the relationships stemming from the second-stage equation between predicted total assets and predicted food insecurity, and between cumulative shock exposure and predicted food insecurity. As in previous models, food insecurity increases with shock exposure and decreases with higher total assets (which in turn is determined by cumulative participation in groups or in trainings).

Figure 26: Effects of predicted assets and shock exposure on food insecurity



Significance level of explanatory variable: *p<0.1 ** p<0.05 ***p<0.01 ns not significant
Note: FIES; 0-3 food secure; 4-7 moderately food insecure; >7 severely food insecure

The instrumental variables model further confirms that household food insecurity in the Kenya RMS sample is related to cumulative shock exposure. Taken together, household food security for the PREG RMS sample is extremely vulnerable to shock exposure and a consistently important lever for mitigating this vulnerability is household asset levels. Further, cumulative participation in groups and trainings exhibits a strong relationship with levels of assets.

5.5 PERCEIVED RESILIENCE: INSTRUMENTAL VARIABLE MODEL

In this section, a similar instrumental variable model as that presented in the previous section is used to further explore the perceived resilience model presented in Section 5.3. That is, the current model treats confidence to adapt as the "second-stage" dependent variable (i.e., instead of level of food insecurity). The two equations used are represented as follows:

1. Total asset score is principally determined by participation in groups and/or trainings
2. Confidence to adapt to future shocks is determined by total assets (which are determined by participation in groups and/or trainings).

The dependent variable in the principal equation (2) is a binary variable that assigns a value of "1" to households that respond they are confident or very confident in their ability to adapt to future

shocks and a value of "0" to those who do not. As in Section 5.4, the dependent variable in the first-stage equation (1) is the total asset score and measures of cumulative participation in groups and trainings serve as valid instruments. The difference in this case is that total asset levels serve as the principal mediating factor between cumulative program participation and *confidence to adapt to future shocks* (rather than food insecurity).

Table 12 shows regression results for both the first-stage (dependent variable = total asset score) and second-stage (dependent variable = confidence to adapt) equations. The results of the first-stage equation are essentially the same as those presented in the first-stage equation in Section 5.4; cumulative participation in groups and in trainings both exhibit a strong relationship with total assets, even when controlling for other factors. The second-stage results demonstrate that predicted total assets, determined by cumulative participation in trainings and in groups, is strongly related to higher confidence to adapt to future shocks.

Table 12: Coefficient signs and significance for IV model: program participation, assets, and confidence to adapt

Explanatory Variable	"First-stage"	"Second-stage"
	DV: Total asset score	DV: Confidence to adapt (binary)
Farming as a livelihood (BL)	(+)**	
Livestock production as a livelihood (BL)		(-)**
Improved water (BL)	(+)**	
Improved sanitation (BL)	(+)*	
Urban (BL)	(+)**	
Cumulative index of shock exposure (t)		
HH gave assistance to others (t)	(+)***	(+)***
HH received assistance from others (t)		(-)**
HH received humanitarian assistance (t)		
Livestock assets (TLU, t-1)	(+)***	
Resilience capacity index (BL)	(+)***	
Cumulative participation in groups (count) (t)	(+)***	
Cumulative participation in training (count) (t)	(+)***	
Total asset score (t)		(+)**

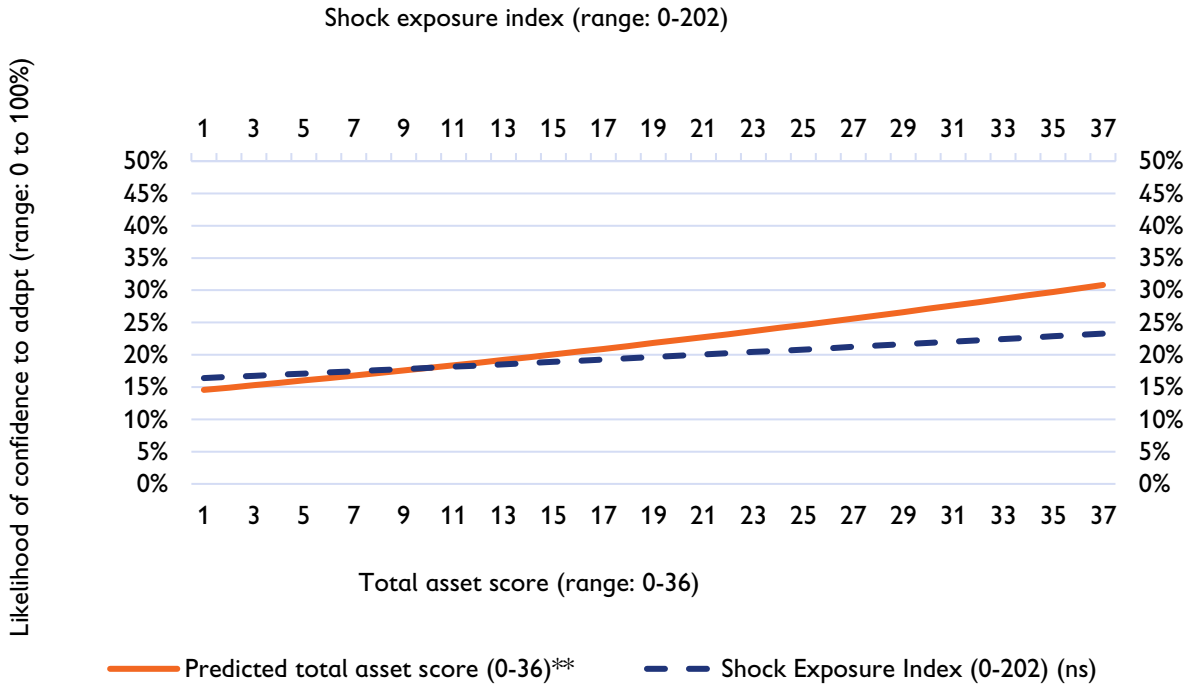
Significance level of explanatory variable: *p<0.1 ** p<0.05 ***p<0.01 ns not significant
(+) variable is positively related to food insecurity; (-) variable is inversely related to food insecurity
(BL) measured at baseline; (t) measured in the current time period; (t-1) measured in the previous time period

Figure 27 illustrates the key relationships derived from the second-stage equation between predicted total assets and predicted confidence to adapt and between cumulative shock exposure and predicted confidence to adapt. Recalling that total asset levels increase as participation in groups and trainings increases (see Section 5.4), households that did not participate in any groups or trainings have lower confidence than households that did participate (in either groups or trainings). Increasing shock exposure has no statistically significant effect on confidence to adapt.

In summary, the key finding from this second formulation of the Instrumental Variable model is that, like food insecurity, asset levels contribute to better household outcomes, in this case to

confidence to adapt to future shocks. Again, cumulative participation in both groups and in trainings, through layering of programming activities, and/or participation in programming over longer periods, exhibits a strong relationship with levels of assets.

Figure 27: Effects of shock exposure and total assets on confidence to adapt to future shocks



Significance level of explanatory variable: *p<0.1 ** p<0.05 ***p<0.01 ns not significant

KEY TAKEAWAYS: PROJECT PARTICIPATION, RESILIENCE CAPACITIES, AND RESILIENCE OUTCOMES

Cumulative shock exposure experienced by households increases their food insecurity in each round, and negatively impacts their ability to reduce food insecurity across the RMS rounds. The ability of households to maintain or improve food security in the face of shocks are strongly and negatively affected by the number and severity of shocks to which the households are exposed.

Household absorptive and adaptive capacities at baseline are associated with better food security in the RMS rounds, although the magnitude of this relationship is quite small. This may be explained by the long interval of one year from baseline to the first RMS round; household resilience capacities are likely to have changed substantially from baseline to RMS. Thus, the strength of the relationship is less likely than if compared with more contemporaneous measures of resilience capacities.

Current levels of household assets are strongly associated with better food security and ability to improve food security across RMS rounds.

Baseline resilience capacities (absorptive, adaptive, transformative, and overall) are all strongly and positively related to households' perceived ability to cope with future shocks over the RMS rounds. These results suggest that enhanced resilience capacities have a long-term positive impact on households'

perceived ability to recover from shocks. Also of interest, cumulative shock exposure did not affect households' perceptions of ability to cope with future shocks.

Despite a particularly severe set of shocks experienced among households and a corresponding downward trend in food security outcomes during the RMS period, participation in resilience programming activities enhances food security through increases in resilience capacity, in particular with an increase in assets.

6 CONCLUSIONS

The Recurrent Monitoring System of the PREG II Impact Evaluation provides information about how a subsample of households of the baseline survey have coped with shocks that they have been exposed to over time. Information was collected about households' exposure to different types of shocks, coping strategies adopted, food security outcomes, households perceived ability to recover from future shocks, and selected key resilience capacity components. A sample of 838 households was selected and information was collected from approximately 720 to 750 households, depending on the round.

Impacts of COVID-19

Additional questions were added to both the qualitative and quantitative components of the fourth RMS round to obtain information about households' awareness of COVID-19, the impacts of restrictions imposed to control the spread of the virus, strategies adopted by households, and need for additional support. Although awareness of COVID-19 was generally high among most respondents, the elderly, children, illiterate people, and other isolated groups tended to have lower levels of awareness. The most common impacts of restrictions to control the spread of the virus were increased prices of food, lack of access to food and livestock markets, and loss of income. Households responded to the restrictions most commonly by reducing food consumption, getting food on credit, and reducing household expenses generally. One-third of surveyed households reported selling livestock to meet their needs during the time of the COVID-19 restrictions. Households reported ongoing need for personal protective equipment, food assistance, and better access to health care.

Trends in Resilience Indicators

During the RMS period, households were exposed to a sequence of different shocks: first, drought, then flooding, then crop pests, and finally COVID-19 in the last RMS round. In the face of ongoing exposure to these different shocks, households adopted a wide range of coping strategies, significantly more than were adopted at the baseline. Reported recovery from shocks was low over all four RMS rounds, likely due to continuing exposure to shocks, and the percentage of households reporting food insecurity increased over RMS rounds.

Resilience Programming Participation, Capacities and Outcomes

Findings from multiple regression analyses demonstrate that resilience programming enhances food security and recovery from shocks indirectly by enhancing resilience capacities of households, in particular household assets. Participation in resilience programming is strongly correlated with increases in household assets, which in turn is positively correlated with current household food security and ability to recover food security levels in the face of shocks. In the face of a sequence of particularly severe shocks and stresses, participation in programming had a strong, positive effect with respect to increases in assets, and in turn, food security. In addition, the analysis indicates that more intense participation in programming, both in terms of duration

and number or types of interventions, is associated with higher levels of assets and improved food security in the face of extreme and persistent shock and stress.

Better resilience outcomes are strongly associated with current resilience capacities (particularly assets), but less strongly associated with lagged levels of resilience capacities. In particular, baseline values of resilience capacities are only weakly associated with better resilience outcomes in the RMS rounds. Results from analysis of household resilience capacities at each RMS round suggest that resilience capacities can change over time, which suggests that measures of current resilience capacity may show a stronger positive relationship with resilience outcomes. Such findings highlight the need to support transformative capacities and household strategies for rebuilding household-level resilience capacities that may have been depleted in response to continuing or recurring exposure to shocks.

There is a positive relationship between resilience capacities (measured at baseline), with households' reported ability to recover from future shocks. This suggests that households that attain higher levels of resilience capacity have a greater sense of agency in their own futures. The direction of causality in this relationship is not clear—do households with more resilience capacity then have a greater sense of agency, or are households with a greater sense of agency more likely to have better resilience capacity? This is a question for further research.

Recommendations for Future PREG II Resilience Surveys

Several recommendations have emerged from this RMS analysis on how to improve future resilience surveys conducted as part of the PREG II coordination and learning platform. First, the sampling design of the mid-term and follow-up surveys of the impact evaluation study will need to be reviewed and updated. One important finding from the RMS is that project implementation of and household participation in resilience-enhancing activities under the PREG partnership has not been cleanly delineated geographically across the high- and low-intensity counties as initially defined by PREG. Using information from the RMS survey responses, project direct participants and non-participants can be distinguished, but beneficiaries of systems-level interventions such as support to local government services and value chains were not identified from questions directed to households. A revision of the sampling strategy for the PREG II mid-term survey should be undertaken to ensure that the sample adequately incorporates direct participants, indirect beneficiaries and non-beneficiaries, in order to adequately measure the impacts of all types of resilience programming interventions. This will require further consultation with PREG implementing partners to better understand the geographic scope of their systems-level interventions. The strategy used to classify beneficiaries will need to be modified to ensure that indirect beneficiaries of systems-level interventions are identified in the sample.

Second, the next round of RMS should be initiated immediately after the implementation of the mid-term survey, scheduled to take place in September 2021. This way, the resilience capacities measured in the mid-term survey, which will be a full survey akin to the baseline that captures information about the full range of resilience capacities, will be more closely aligned with the responses to shocks measured in the RMS.

We also recommend exploring in more detail the relationships between participation and socio-economic characteristics of households in later rounds of the evaluation. In particular, whether wealthier households are more likely to participate in program activities or whether participation is driving higher wealth, particularly assets, for those households that do participate. Findings from this RMS study suggest there is a strong relationship between participation and assets, and this relationship merits further exploration.

Another recommendation is to collect more detailed participation information during the second wave of the RMS following the mid-term survey in 2022. The questions designed to capture participation information should be crafted in coordination with the PREG team to capture information regarding important interventions being implemented through the PREG II partnership that 1) household participants will be able to identify, and 2) the information should include the specific points in time the household is participating in the intervention.

Finally, the RMS survey should be designed to track changes in more resilience capacities, including access to information, access to shock preparedness and mitigation support, and changes in key transformative capacity components, i.e. access to different kinds of services. These are all critical resilience capacity components that may change within the time frame of an RMS study.

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APPENDIX 1. RMS QUANTITATIVE SURVEY

USAID FROM THE AMERICAN PEOPLE	**Partnership for Economic Growth (PREG) in northern Kenya Impact Evaluation** **PREG Recurrent Monitoring Household Survey Questionnaire—Round 4**

MODULE 1: HOUSEHOLD IDENTIFICATION COVER SHEET

101: HHID	102: EA	103: County	104: District	105: Location	106: Sublocation	107: GPS UNIT (UTM reading)				116: Enumer Code	114: Super Code
						WP	ELEV	Easting	Northing		

110: Name of Household Head	111: Name of Respondent		115: Date of survey *dd/mm/year*		

q109: Household Status		q109a: Household Status Comments
1	HH available	
2	HH unavailable (no answer)	
3	HH absent	
6	Dwelling vacant	
7	Dwelling destroyed	
8	Dwelling not found	
9	Unable to reach household, network coverage issues	
10	Unable to reach household, number no longer in service/phone closed	
11	Unable to reach household, phone number belongs to someone else	
96	Other	

MODULE B(1). INFORMED CONSENT

INTRODUCE THE HOUSEHOLD TO THE SURVEY AND OBTAIN THE CONSENT OF A RESPONSIBLE ADULT IN THE HOUSEHOLD.

ASK TO SPEAK WITH A RESPONSIBLE ADULT IN THE HOUSEHOLD:

STATEMENT TO BE READ TO THE RESPONDENT:
Thank you for the opportunity to speak with you. We are a research team from Kimetrica. We are conducting a survey to learn about agriculture, food security, food consumption, nutrition and wellbeing of households in this area. Your household has been selected to participate in an interview that includes questions on topics such as the stresses you have been exposed to and your family's food consumption. These questions in total will take approximately one half hour (30 minutes) to complete and your participation is entirely voluntary. If you agree to participate, you can choose to stop at any time or skip any questions you do not want to answer. Your answers will be completely confidential; we will not share information that identifies you with anyone. After entering the questionnaire into a database, we will destroy all information such as your name that could link these responses to you.

Do you have any questions about the survey or what I have said? If in the future you have any questions regarding the survey or the interview, or concerns or complaints we welcome you to contact Kimetrica, by calling +254725926513. We will leave a copy of this statement and our organization's complete contact information with you so that you may contact us at any time.

Do you have any questions?
May I begin the interview now?

SIGNATURE OF INTERVIEWER: _____ DATE: _____

RESPONDENT AGREES TO BE INTERVIEWED....1 RESPONDENT DOES NOT AGREE TO BE INTERVIEWED.....→2 END. "Thank you very much for your time."

↓

CONTINUE
WITH
SURVEY

MODULE 2. ABBREVIATED HOUSEHOLD ROSTER

[**INSTRUCTION:** This module is to be asked to the *HOUSEHOLD HEAD (HH)* or the *SPOUSE* of the Household Head if he/she is not available at the household during the time of interview. The respondent can get help from other household members if it is required.]

Q202	Q202a	Q202b	Q202c	Q203	Q204	Q205	Q207	Q206
Is there a new head of household? 1.Yes <- Skip to Q203 2.No	What is the name of the new head of household?	Sex of the new head of household 1. Male 2. Female	Age of the new head of household	What is the name of the respondent?	What is the relationship of the respondent to the household head? 1. Household head 2. Spouse 3. Son/Daughter 4. Other relative 5. Not related	Sex of the respondent 1. Male 2. Female	Telephone number of the household (Enter 10-digit phone number) (Enter 999 if no telephone number) (Enter -9 if refused)	Total number of household members

MODULE R1. SHOCKS AND STRESSES

	R103	R104	R105	R106	R107
	Did your household experience [the shock] within the last 3 months? 1= Yes 2 = No >>NEXT SHOCK	How severe was the impact on your household's income over the last 3 months? ENTER CODE FROM LIST ONLY ASK IF R103=1	How severe was the impact on your household's food consumption over the last 3 months? ENTER CODE FROM LIST ONLY ASK IF R103=1	How did your household cope with [the shock] over the last 3 months? ENTER CODE FROM LIST IN R106.a SELECT ALL THAT APPLY ONLY ASK IF R103=1	To what extent has your household been able to recover from [the shock]? ENTER CODE FROM LIST ONLY ASK IF R103=1
Climatic shocks					
1. Excessive rains/flooding					
2. Variable rain/drought					
3. Hail/frost					
4. Landslides/erosion					
Biological shocks					
5. Crop disease (e.g., rust on wheat, sorghum)					
6. Crop pests (e.g., locusts, army worms, or animals eating crops)					
7. Weeds (e.g., associated with striga)					
8. Livestock disease					

	R103	R104	R105	R106	R107
9. Human disease outbreaks (e.g., from contaminated water)					
10. Soil degradation/loss of soil fertility/ or salinization					
Conflict shocks					
11. Theft or destruction of assets					
12. Theft of livestock (raids/ cattle rustling)					
13. Conflict over natural resources/land encroachment					
24. Conflict over access to fodder for animals					
25. Conflict over access to water for animals					
14. Displacement (e.g., due to oil, gas, etc.)					
15. Insecurity/violence (e.g., elections-related, tribal, extremism, etc.)					
Economic shocks					
16. Interruptions or delays in safety net or humanitarian assistance (hunger safety net programme/national safety net programme)					
17. Increased food prices					
18. Increased prices of agricultural or livestock inputs					

	R103	R104	R105	R106	R107
19. Decreased prices for sale of agricultural or livestock products					
20. Loss of land/rental property					
21. Unemployment for youths (i.e., which may lead to youth migration)					
22. Illness or death of breadwinners, or exceptional health expenses of household member					
23. Political strikes					

Shocks and Stresses Continued		
R104, R105: Severity of Impact		**R107: Recovery**
1. No impact 2. Slight decrease 3. Severe decrease 4. Worst ever happened -8. Don't know		1. Did not recover 2. Fully recovered, same as before the shock 3. Fully recovered and better than before the shock 4. Partially recovered 5. Not affected by [event] -8. Don't know
R106a: Coping strategies		
LIVESTOCK AND LAND HOLDINGS		**COPING STRATEGIES TO GET MORE FOOD OR MONEY**
1. Sent livestock in search of pasture		13. Took up new/additional work (casual labor, wage labor)
2. Sold livestock		14. Sold household items (e.g., radio, bed)
3. Slaughtered livestock		15. Sold productive assets (e.g., plough, water pump)
4. Leased out land		16. Took out a loan (with interest) from a (formal) bank
		17. Took out a loan (with interest) from an MFI/RuSACCO
MIGRATION		18. Took out a loan (with interest) from a money-lender
5. Migrate (only some family members)		19. Took out a loan (no interest) from friends or relatives within the community
6. Migrate (the whole family)		20. Took out a loan (no interest) from friends or relatives outside of the community
7. Sent children or an adult to stay with relatives		21. Unconditional gift of money (not remittances) or food from family, friends, church/mosque, or other group within community (bonding)
COPING STRATEGIES TO REDUCE CURRENT EXPENDITURE		22. Unconditional gift of money (not remittances) or food from family, friends, church/mosque or other group outside of community (bridging)
8. Took children out of school		23. Sent children to work for money (e.g., domestic service)
9. Moved to less expensive housing		24. Received emergency food aid from the government or NGO
10. Reduced food consumption (quantity/meal; # meal/day)		25. Received emergency cash transfer from the government or NGO
11. Reduced non-essential HH expenses		26. Received permanent direct support food from the government or NGO
12. Got food on credit from a local merchant		27. Received permanent direct support cash transfer from the government or NGO
		28. Participated in government or NGO food-for-work or cash-for-work activities (conditional)
		29. Used savings to buy livestock
		30. Used savings to buy productive inputs
		31. Used savings to pay for health-care expenses
		32. Used savings to feed the family

Shocks and Stresses Continued		
		33. Used savings to pay for education costs
37. Other (specify)		34. Used own savings to pay for other household necessities
38. Did nothing		35. Used own savings to pay for repairs to dwelling or structures
39. Engaged in spiritual efforts (e.g., prayed, sacrifices, etc.)		36. Relied on remittances from a relative that migrated

Shock exposure and severity		
R111	How confident are you that your household can cope with a severe shock **(NOT including coronavirus)** without significant depletion of assets, harm to family members, or damage to household livelihood activities?	1. Not confident at all/it is impossible 2. Not confident 3. Neutral/not sure 4. Somewhat confident 5. Very confident

MODULE F1. FOOD INSECURITY EXPERIENCE SCALE (FIES)

ASK THESE QUESTIONS OF THE PERSON RESPONSIBLE FOR HOUSEHOLD FOOD PREPARATION.

"Moving on to another topic, I'd like to ask you a few questions about the availability of food in your home."

F01	During the last 3 months, was there a time when you or others in your household were worried you would not have enough food to eat because of a lack of money or other resources?	1. Yes 2. No
F02	Still thinking about the last 3 months, was there a time when you or others in your household were unable to eat healthy and nutritious food because of a lack of money or other resources?	1. Yes 2. No
F03	Was there a time when you or others in your household ate only a few kinds of foods because of a lack of money or other resources?	1. Yes 2. No
F04	Was there a time when you or others in your household had to skip a meal because of a lack of money or other resources to get food?	1. Yes 2. No
F05	Still thinking about the last 3 months, was there a time when you or others in your household ate less than you thought you should because of a lack of money or other resources?	1. Yes 2. No
F06	Was there a time when your household ran out of food because of a lack of money or other resources?	1. Yes 2. No
F07	Was there a time when you or others in your household were hungry but did not eat because there was not enough money or other resources for food?	1. Yes 2. No
F08	During the last 3 months, was there a time when you or others in your household went without eating for a whole day because of a lack of money or other resources?	1. Yes 2. No

MODULE R3. HOUSEHOLD DIETARY DIVERSITY

Ask these questions of the primary female decision-maker or whoever is most knowledgeable about the food consumption of household members.

"Now I would like to ask you about the types of foods that you or anyone else in your household ate yesterday during the day and at night. Please include all food eaten both at your home or away from home."

Read the list of foods. Choose "yes" if anyone in the household ate the food in question. Choose "no" if no one in the household ate the food.

F3000	Was yesterday an unusual or special day (festival, funeral, fasting, etc.) where you at special foods or where you ate more, or less, than usual?	1. Yes 2. No
F3001	Maize, bread, rice, millet, barley, bulgur wheat, porridge, buckwheat, noodles, teff, nifro, or other foods made from cereals/grains?	1. Yes 2. No
F3002	Cassava, potatoes, sweet potatoes, yams, taro, false banana/enset, or any other foods made from roots?	1. Yes 2. No
F3003	Any vegetables (leaves)? Such as spinach, lettuce, beetroot, kale, moringa, carrots, pumpkin leaves, okra, pumpkin, squash, gourds (including bitter & bottle), mushrooms, radish, tomato, cucumber, cabbage, cauliflower, green leafy vegetables, skus, broad beans, brinjals, green peas	1. Yes 2. No
F3004	Any fruits? Including apples, oranges, banana, guava, papaya, mangoes, pineapple, berries, watermelon, avocado, cactus	1. Yes 2. No
F3005	Any meat? Lamb, camel, goat, chicken, kok, jigra (guinea fowl), or other birds, beef, liver, kidney, heart, or other organ meats or blood?	1. Yes 2. No
F3006	Any eggs? (chicken, ostrich, guinea fowl/jigra)	1. Yes 2. No
F3007	Any fresh or dried fish?	1. Yes 2. No
F3008	Any foods made from beans, peas, lentils, cowpeas, pigeon peas, groundnuts, peanuts, soyabeans, chickpeas, haricot beans?	1. Yes 2. No
F3009	Any cheese, yogurt, milk, sour milk, skimmed milk, or other dairy products?	1. Yes 2. No
F3010	Any foods made with oil, animal fat or butter?	1. Yes 2. No

Ask these questions of the primary female decision-maker or whoever is most knowledgeable about the food consumption of household members.

"Now I would like to ask you about the types of foods that you or anyone else in your household ate yesterday during the day and at night. Please include all food eaten both at your home or away from home."

Read the list of foods. Choose "yes" if anyone in the household ate the food in question. Choose "no" if no one in the household ate the food.

F3011	Any sugar or honey, granulated sugar, sugar cane, sweet reed/tinksh/ageda?	1. Yes 2. No
F3012	Any other foods, such as condiments, salt, pepper, chili, ginger, garlic, cardamom, cumin, cinnamon, spices, coffee, or tea?	1. Yes 2. No

MODULE R2. ASSET OWNERSHIP

ASSET OWNERSHIP		
e702. HOUSEHOLD ASSETS		**Household owns any (asset)** **1. Yes** **2. No** **-8 Don't know** **-9 Refused**
e702_01	Fan	
e702_02	Air conditioner	
e702_03	Radio	
e702_04	Tape or CD/DVD player/VCR	
e702_05	Television	
e702_06	Sewing machine	
e702_07	Kerosene/paraffin stove	
e702_08	Electric stove; hot plate	
e702_09	Gas stove	
e702_10	Refrigerator	
e702_11	Washing machine	
e702_12	Bicycle	
e702_13	Boat	
e702_14	Motorcycle/scooter	
e702_15	Car or other motorized vehicle used to transport people or goods	
e702_16	Upholstered chair, sofa set	
e702_17	Coffee table (for sitting room)	
e702_18	Cupboard, drawers, bureau	
e702_19	Lantern (paraffin)	
e702_20	Desk	
e702_21	Clock	
e702_22	Iron box (for pressing clothes)	
e702_23	Computer equipment & accessories	
e702_24	Satellite dish	

ASSET OWNERSHIP		
e702_25	Solar panel	
e702_26	Generator	
e702_27	Water storage tank or water purification system	
e702_28	Charcoal stove	
e702_29	Animal cart	
e702_30	Microwave oven	
e702_31	Vacuum cleaner	
e702_32	Mobile phone	
e702_33	Other small, electric household appliances	
e702_34	Other large electronic products not already reported	
e702_35	Bed	
e702_36	Dining table	
e702_37	Dining chair	
e702_38	Other large piece of furniture not already reported	
r201. PRODUCTIVE ASSETS		**Household owns any (asset)** **1. Yes** **2. No** **-8 Don't know** **-9 Refused**
r201_01	Plough (oxen-pulled)	
r201_02	Mechanical plough	
r201_03	Sickle	
r201_04	Pick axe	
r201_05	Axe	
r201_06	Pruning/cutting shears	
r201_07	Hoe	
r201_08	Spade or shovel	
r201_09	Traditional beehive	
r201_10	Modern beehive	
r201_11	Knapsack chemical sprayer	

ASSET OWNERSHIP		
r201_12	Mechanical water pump	
r201_13	Motorized water pump	
r201_14	Stone grain mill	
r201_15	Motorized grain mill	
r201_16	Broad bed maker (oxen-pulled)	
r201_17	Small tractor	
r201_18	Hand-held motorized tiller	
r201_19	Agricultural land (hectares)	
r201a. LIVESTOCK ASSETS		Number owned now -8. Don't know -9. Refused
r201a_01	Oxen	
r201a_02	Cattle	
r201a_03	Goats	
r201a_04	Sheep	
r201a_05	Donkey/mule	
r201a_06	Poultry	
r201a_07	Camels	
r201a_08	Horse	
r201a_09	Honey bees (hives)	

MODULE R3. FODDER AND WATER AVAILABILITY

R301	Is there enough fodder to feed all of your animals?	1. Yes 2. No -8 DK -9 Refused
R302	Is there enough water for all of your animals?	1. Yes 2. No -8 DK -9 Refused

MODULE R13. SOCIAL AND CAPACITY-BUILDING SUPPORT

R1301	Have you *provided* any money or food or other assistance to any other households in the past 3 months?	1. Yes 2. No -8 DK -9 Refused
R1302	If yes, to whom did you *provide* support? **Read list; select all that apply**	1. Relatives inside your community 2. People in your community who are not relatives 3. Relatives outside your community 4. People outside your community who are not relatives -8 DK -9 Refused
R1303	Have you *RECEIVED* any money or food or other assistance to any other households in the past 3 months?	1. Yes 2. No -8 DK -9 Refused
R1304	If yes, from whom did you *receive* support? **Read list; select all that apply**	1. Relatives inside your community 2. People in your community who are not relatives 3. Relatives outside your community 4. People outside your community who are not relatives -8 DK -9 Refused

MODULE R14. ASPIRATIONS AND CONFIDENCE TO ADAPT

R1401	Please tell me which one of these two views you most agree with.	1. "Each person is primarily responsible for his/her success or failure in life." 2. "One's success or failure in life is a matter of his/her destiny."
R1402	Please tell me which one of these two views you most agree with.	1. "To be successful, above all one needs to work very hard." 2. "To be successful above all one needs to be lucky."

MODULE R11. HUMANITARIAN ASSISTANCE

R1101	In the last three months, has your household received any food aid from the government or an NGO?	1. Yes 2. No -8 DK -9 Refused
R1102	In the last three months, has your household received any cash from the government or an NGO?	1. Yes 2. No -8 DK -9 Refused
R1103	In the last three months, has anyone in your household participated in food-for-work or cash-for-work?	1. Yes 2. No -8 DK -9 Refused
R1104	In the last three months, has your household received any assistance from the government or an NGO with feed or fodder for your animals?	1. Yes 2. No -8 DK -9 Refused
R1105	In the last three months, has your household received assistance from the government or an NGO with access to drinking water	1. Yes 2. No -8 DK -9 Refused
R1106	In the last three months, did you receive assistance from the government or an NGO with access to water for animals?	1. Yes 2. No **(Skip to r1108)** -8 DK -9 Refused
R1107	Did your animals get some of this water?	1. Yes 2. No -8 DK -9 Refused
R1108	In the last three months, did you take a child to get help at a feeding center because they did not have enough food to eat?	1. Yes 2. No -8 DK -9 Refused

MODULE R16. HOUSEHOLD ENGAGEMENT IN PREG ACTIVITIES

R1601	Has any household member participated in any training in the last THREE MONTHS?	1. Yes 2. No → R1603 -8 DK → R1603
R1602	What kind of training? (Multiple response)	1. Alternative livelihoods/income-generating activities 2. Livestock production practices/health/management 3. Crop production practices 4. Crop or livestock marketing 5. Business/financial/accounting practices 6. Rangeland management 7. Nutrition training 8. Savings/microfinance 9. WASH practices 10. Conflict management 11. Life skills (hygiene/family planning, etc.) 12. Youth skills training (apprenticeship/internship, etc.) 13. Other (specify)
R1603	Has any household member participated in any group in the last THREE MONTHS?	1. Yes 2. No → Skip to end -8 DK → Skip to end
R1604	What kinds of groups? (multiple response)	1. Savings and loan groups (VSLA, REAP, BOMA, etc.) 2. Livestock management associations (LMA, etc.) 3. Livestock producer groups 4. Self-help groups (ADESO, etc.) 5. Women groups (GIRL model (MC), etc.) 6. Mothers' groups 7. Village committees (water management, NRM, conflict management health, school, etc.) 8. Ward level committees (WARD adaptation planning committee, etc.) 9. Other (specify)

MODULE R17. CORONAVIRUS AWARENESS AND IMPACTS

	CORONAVIRUS AWARENESS AND IMPACTS	
R1701	Are you aware of Coronavirus?	1 Yes 2 No -8 DK -9 Refused } GO TO END
R1702	How did you find out about it? **SELECT ALL THAT APPLY.**	1 Public announcement 2 Radio/television 3 Health officials (Including Health Extension Workers) 4 Other government officials 5 NGO workers 6 Religious leaders/ church/ mosque 7 Health Development Army 8 Mobile phone ringing effect 9 Family members/ relatives/ friends/ neighbors 10 Other (specify)_____
R1703	Has Coronavirus affected your household's livelihoods/income?	1 Yes 2 No -8 Don't know -9 Refused } SKIP TO R1706

	CORONAVIRUS AWARENESS AND IMPACTS	
R1701	Are you aware of Coronavirus?	1 Yes 2 No -8 DK -9 Refused GO TO END
R1704	How has Coronavirus affected your household's livelihoods/income? **SELECT ALL THAT APPLY.**	
	1 Inability to access market to sell products or buy inputs (movement restrictions or market closed) 2 Inability to access agricultural commodity market to sell products or buy inputs (movement restrictions or market closed) 3 Inability to access markets for food and other necessities (movement restrictions or market closed) 4 Inability to farm and/or care for livestock due to sickness of HH member 5 Constrained access to land 6 Constrained access to pasture 7 Constrained access to water 8 Shortage of crop inputs (seeds, fertilizer, pesticides) 9 Shortage of livestock inputs (feed and veterinary services) 10 Increase in price of crop inputs 11 Increase in price of livestock inputs 12 Increase in transportation costs 13 Increase in storage costs 14 Decrease in price of products sold 15 Increase in price of products sold 16 Decrease in demand for products 17 Difficulty accessing financial services and credit 18 Labor shortages (lack of labor to help with farming and processing) 19 Unable to engage with other community members in asset-building activities (dike construction, erosion control, road building, road maintenance, tree planting) 20 Lost employment 21 Looting/theft 22 Inability to access health care 23 Delay or interruption of cash assistance 24 Illness 25 Death 26 Reduction in income 27 Increase in price of food and other items 28 Inability to repay loans 27 Other (specify)_____ -8 Don't know -9 Refused	

R1705	How has your household coped with the impacts of Coronavirus on your household's livelihoods? **SELECT ALL THAT APPLY.**

Coping strategies	
LIVESTOCK AND LAND HOLDINGS	**ACQUIRING MORE FOOD OR MONEY**
1. Sent livestock in search of pasture	13. Took up new/additional work (casual labor, wage labor)
2. Sold livestock	14. Sold household items (e.g., radio, bed)
3. Slaughtered livestock	15. Sold productive assets (e.g., plough, water pump)
4. Leased out land	16. Took out a loan (with interest) from a (formal) bank
MIGRATION	17. Took out a loan (with interest) from an MFI/RuSACCO
5. Migrate (only some family members)	18. Took out a loan (with interest) from a money-lender
6. Migrate (the whole family)	19. Took out a loan (no interest) from friends or relatives within the community
7. Sent children or an adult to stay with relatives	20. Took out a loan (no interest) from friends or relatives outside of the community
REDUCE CURRENT EXPENDITURE	21. Unconditional gift of money (not remittances) or food from family, friends, church/mosque, or other group within
8. Took children out of school	22. Unconditional gift of money (not remittances) or food from family, friends, church/mosque or other group outside of community
9. Moved to less expensive housing	23. Sent children to work for money (e.g., domestic service)
10. Reduced food consumption (quantity/meal; # meal/day)	24. Received emergency food aid from the government or NGO
11. Reduced non-essential HH expenses	25. Received emergency cash transfer from the government or NGO
12. Got food on credit from a local merchant	26. Received permanent direct support food from the government or NGO
CORONAVIRUS-SPECIFIC	27. Received permanent direct support cash transfer from the government or NGO
40. Quarantine	28. Participated in government or NGO food-for-work or cash-for-work activities (conditional)
41. Used physical separation to distance sick member from others	29. Used savings to buy livestock
42. Avoided contact with sick member	30. Used savings to buy productive inputs
43. Washed hands with water and soap	31. Used savings to pay for health-care expenses
44. Washed hands more frequently	32. Used savings to feed the family
45. Sought help at a health clinic	33. Used savings to pay for education costs
	34. Used own savings to pay for other household necessities
37. Other (specify)	35. Used own savings to pay for repairs to dwelling or
38. Did nothing	36. Relied on remittances from a relative that migrated
39. Engaged in spiritual efforts (e.g., prayed, sacrifices, etc.)	

	CORONAVIRUS AWARENESS AND IMPACTS	
R1706	Has Coronavirus affected your household's access to food?	1 Yes 2 No -8 Don't know -9 Refused SKIP TO R1709
R1707	How has Coronavirus affected your household's access to food? **SELECT ALL THAT APPLY.**	1 Unable to go to market (movement restrictions or market closed) 2 Traders are absent from the markets 3 Products not available in the market 4 Price of foods increased 5 Delay of food aid 6 Other (specify)_____ -8 Don't know -9 Refused
R1708	How has your household coped with the impacts of Coronavirus on your household's access to food? **SELECT ALL THAT APPLY.**	

Coping strategies	
LIVESTOCK AND LAND HOLDINGS	**ACQUIRING MORE FOOD OR MONEY**
1. Sent livestock in search of pasture	13. Took up new/additional work (casual labor, wage labor)
2. Sold livestock	14. Sold household items (e.g., radio, bed)
3. Slaughtered livestock	15. Sold productive assets (e.g., plough, water pump)
4. Leased out land	16. Took out a loan (with interest) from a (formal) bank
MIGRATION	17. Took out a loan (with interest) from an MFI/RuSACCO
5. Migrate (only some family members)	18. Took out a loan (with interest) from a money-lender
6. Migrate (the whole family)	19. Took out a loan (no interest) from friends or relatives within the community
7. Sent children or an adult to stay with relatives	20. Took out a loan (no interest) from friends or relatives outside of the community
REDUCE CURRENT EXPENDITURE	21. Unconditional gift of money (not remittances) or food from family, friends, church/mosque, or other group within community
8. Took children out of school	22. Unconditional gift of money (not remittances) or food from family, friends, church/mosque or other group outside of community
9. Moved to less expensive housing	23. Sent children to work for money (e.g., domestic service)
10. Reduced food consumption (quantity/meal; # meal/day)	24. Received emergency food aid from the government or NGO

	CORONAVIRUS AWARENESS AND IMPACTS	
11. Reduced non-essential HH expenses		25. Received emergency cash transfer from the government or NGO
12. Got food on credit from a local merchant		26. Received permanent direct support food from the government or NGO
CORONAVIRUS-SPECIFIC		27. Received permanent direct support cash transfer from the government or NGO
40. Quarantine		28. Participated in government or NGO food-for-work or cash-for-work activities (conditional)
41. Used physical separation to distance sick member from others		29. Used savings to buy livestock
42. Avoided contact with sick member		30. Used savings to buy productive inputs
43. Washed hands with water and soap		31. Used savings to pay for health-care expenses
44. Washed hands more frequently		32. Used savings to feed the family
45. Sought help at a health clinic		33. Used savings to pay for education costs
		34. Used own savings to pay for other household necessities
46. Other (specify)		35. Used own savings to pay for repairs to dwelling or structures
38. Did nothing		36. Relied on remittances from a relative that migrated
39. Engaged in spiritual efforts (e.g., prayed, sacrifices, etc.)		

R1709	How has coronavirus affected your social relations? **SELECT ALL THAT APPLY**	1. Increased violence in household 2. Increased violence in community 3. Decreased violence in household 4. Decreased violence in community 5. Better relations with family/ friends/neighbors 6. Worse relations with family/ friends/neighbors 7. No impact on social relations 8. Other (specify) -8 Don't know -9 Refused
R1710	How confident are you that your household can cope with the challenges associated with coronavirus?	1 Not confident at all/it is impossible 2 Not confident 3 Neutral/not sure 4 Somewhat confident 5 Very confident 6 Not applicable (not facing any challenges -8 Don't know

	CORONAVIRUS AWARENESS AND IMPACTS	
		-9 Refused
R1711	What would help you cope with coronavirus? **SELECT ALL THAT APPLY**	1 Handwashing stations 2 Provision of drinking water 3 Soap 4 Masks 5 Gloves 6 Better access to health care services 7 Food aid 8 Cash aid 9 More information 10 Other_____ -8 Don't know -9 Refused
R1712	In the last 90 days, has anyone in your household contracted coronavirus or showed any of sign/symptoms of coronavirus (high fever, coughing, shortness of breath, difficulty breathing)?	1 Yes 2 No -8 Don't know -9 Refused } SKIP TO END
R1713	How did your household cope with a member contracting the coronavirus or falling ill with its symptoms?	1 Used physical separation to distance sick member from others 2 Avoided contact with sick member 3 Washed hands with water and soap 4 Washed hands more frequently 5 Sought help at a health clinic 6 Did nothing 7 Other (specify): _____ -8 Don't know -9 Refused

Interview Status	
1	Completed
4	Postponed
5	Refused
9	Other

Interview status other comments:

Future participation
Our team would like to conduct a similar study in 3 months. We would like to return to your household to conduct the survey. Are you willing to participate in the follow-up survey in 3 months? 1. Yes 2. No -8 DK -9 Refused

****THANK YOU****

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

APPENDIX 2. QUALITATIVE TOPICAL OUTLINES

Key Informant Interview Guide (Rounds 1, 3, 4)

Shocks

1. What are the main shocks/stresses the community is experiencing? When did they start? How long do they last (e.g., days, months)? How many people are affected?
2. How do the shocks affect the community (entire community, men/women, and youth)? Possible probes include:
    - Effects on livelihoods/income sources
    - Assets (household, livestock)
    - Migration
    - Access to water (households/livestock)
    - Health and disease
    - Food security and nutrition
    - Functioning of community groups (marketing groups, savings groups, burial societies, etc.)
    - Social relations/networks
    - School attendance/school quality
    - Markets for crops and livestock
    - Availability of food and other goods
    - Access to government services—agriculture and livestock extension, health centers
    - Conflict/ insecurity
    - Outlook on the future/ confidence
3. How has the community responded to the shocks/stresses it has experienced?
4. What has the community done (together) to prepare for future shocks/stresses? ***Probe re: household activities vs communal/collective action.*** Are there differences in who is involved in these activities (e.g., women, youth, elderly, etc.)? How are they involved? (e.g., are women/youth/etc. in leadership or decision-making roles?) Why or why not?
    - Do they participate in any resource mapping/management plans, DRR management/response plans
    - Collective action taken (through government, NGOs, community-based initiatives), e.g. grassroots committees such as rangeland management committees, burial societies
    - Inter-community management of lands
    - Livestock management (e.g., diversification in breeds/species, reducing numbers of livestock, fodder/hay production)
    - Drought insurance

- Livelihood diversification
- Soil conservation (e.g., bunds, contours, gully treatment, etc.)
- Saving crops/grains/fodder (reserves)
- Water management (livestock and people) (including strategic reserves boreholes, i.e., only used during drought)
- Role/extent of information sharing at different levels (village, kebele, woreda, zone, national)

5. How is the shock affecting relationships within the community? Relationships with other communities?
6. What are the main differences between a community that successfully deals with shocks/stresses and one that does not? What would a community itself need to do to successfully deal with shocks/stresses?

Reliance on Other Households during Income and Food Shortages

7. What kind of support do households provide for each other?
8. Any changes in these practices in the last three months? Describe what has changed and why.

Adaptations

9. Have households in the community made any adaptations to reduce the negative impacts of long-term shocks/stresses (e.g., change in livelihood strategies, resource management, use of insurance/savings, etc.)? Please describe.
    - When did they start making these adaptations? What factors motivated/helped/enabled those changes?
    - Has that changed over the last three months (i.e., are they doing anything different now to deal with shocks/stresses than they were doing three months ago)? Have the communities expanded *iddir* to help household cope with shocks/stresses?
        - Has there been migration of youth/others to urban areas because of stresses, including conflict? If yes, how has that changed household's way of adapting to stresses?

Participation in Government or NGO Programs

10. What government or NGO programs are active here?
    - Describe activities (agency, start date, programming)
    - Do government and NGO programs coordinate activities? How does this coordination work? How effective is it? Any changes in coordination in the last three months (improvements, challenges)?
11. How have these programs affected the community (positively or negatively)?
    - In the last three months, have you seen any change in program results/effects?
    - Unintended effects (positive or negative)?
    - Any comments on the PREG program specifically?

Pasture and Water Resources

12. How have these programs affected the community (positively or negatively)?
    - In the last three months, has there been a problem with not enough good grazing land for the number of animals (is it communal grazing land)? Any other problems?
        - If yes, what is the community doing to address these problems?
        - In the last three months, any changes in how communal grazing lands are managed or used? Describe.
    - In the last three months, has there ever been a time when there was not enough water for all the animals?
        - If yes, what is the community doing to address this problem?
        - In the last three months, any changes in how water resources for livestock are managed or used? Describe.
13. Has access to drinking water changed over the past three months?
    - If yes, in what way?
    - What is being done to prevent or cope with drinking water shortages?

Infrastructure and Markets

14. How far away is the nearest livestock market from this village? (km)
    - In the past three months, has there been a time when people in this village could not physically access the livestock market (e.g., market closed, no/poor roads, no/lack of affordable transport, security)?
    - In the past three months, have you seen any changes in people's willingness, interest or need to sell livestock? If yes, in your opinion, what accounts for these changes?
    - In the past three months, are there any factors that have made it difficult to sell livestock? (Probe: physical access to market difficult, no buyers or few buyers, animals thin or diseased, oversupply, other)
15. How far away is the nearest market for agricultural products from this village? (km)
    - In the past three months, has there been a time when people in this village could not physically access this market (e.g., market closed, no/poor roads, no/lack of affordable transport, security)?
16. Does this community have any access to early warning information (e.g., timely and accurate climate data, early warning, livestock, market, etc.)? If so, from what source? How do people use this information?

Key Informant Interview Guide: Additional COVID-19 Questions (Round 4)

Knowledge, Attitudes, and Perceptions

1. How widespread is knowledge of the coronavirus in your community? Probes (if not included in the response):
    - Are people aware of coronavirus signs and symptoms?
    - Are people aware of the methods to avoid exposure and mitigate its spread?
2. Which groups in your community are less likely to be aware of coronavirus?
3. (How) have community perceptions towards outsiders (e.g., from towns/cities or foreigners) coming into the village changed?
4. Are people in your community generally adhering to the guidance? Why or why not?
5. Are there any groups that are less likely or less able to adhere to community guidance on coronavirus?
    - If yes, which groups?
    - Why are they less likely or less able to adhere to the guidance?

Impacts of Coronavirus

6. How has the coronavirus affected your community? Probes (if not included in the response):
    - Are markets for food and other necessities still open and accessible?
        - If food markets are not open or inaccessible, how are households and merchants coping with this?
    - Are markets for agricultural commodities still open and accessible?
        - If Ag commodities markets are not open or inaccessible, how are households and merchants coping with this?
    - Are livestock markets still open and accessible?
        - If livestock markets are not open or inaccessible, how are farmers and traders coping with this?
        - Are different groups of livestock farmers (e.g., female versus male and small/informal versus large) impacted differently? If yes, how?
    - Are staple foods available in the market?
        - If no, why not?
    - Are there shortages of certain food items?
        - If yes, which food items?
    - Have food prices changed?
        - If yes, why?
    - Have transportation costs changed?

    - If yes, why?
- Has access to seeds and other agricultural inputs changed?
    - If yes, why?
- Have the costs of seeds and other agricultural inputs changed?
    - If yes, why?
- Has access to cash, food, or other assistance been affected?
    - If yes, why?
- Have public works or any other construction activities ceased?
    - If yes, how are the workers coping?
- Has access to health services been affected?
    - If yes, why?
- Have costs of services changed?
    - If yes, why?
- Are community members returning to the village (e.g., young migrant workers, students, others, etc.?
    - If yes, how is this impacting the community?

7. Are there restrictions on movement *within* your community? Are there travel restrictions on leaving or (re)entering your community?
8. Are there any rising concerns about public security (e.g., looting/theft, attacks on outsiders, communal tensions)?
9. What groups have been most affected by the coronavirus and/or measures taken to prevent/mitigate its spread (e.g., youth, elderly, homeless, disabled, etc...)?
    - Has coronavirus affected the ability of households to support each other during this time? If yes, why?

Coronavirus Stigma

10. Are people afraid to report their symptoms?—If yes, why?
11. If people have fever, cough, shortness of breath (symptoms of coronavirus) are they stigmatized or face discrimination from community members (e.g., unable to return to market, unable to work)?
12. Are people who recover from the symptoms of coronavirus stigmatized or face discrimination from community members (e.g., unable to return to market, unable to return to work)?

Coronavirus-Related Activities

13. How has your community responded to the coronavirus? Probes (if not included in response):
    - Have there been any activities in your community to raise public awareness on coronavirus?
    - Any activities to improve health services to combat coronavirus?

- Any activities to prevent its spread, e.g., provision of soap for handwashing? Increase in supply of water? Provision of masks/gloves?
- Any food or cash assistance to households?
- Any other in-kind assistance or donations to households?
- Social insurance?
- Tax discounts and subsidies?

14. Who is providing this assistance or carrying out these activities? Probes (if not included in the response):
    - Government?
    - Village leaders?
    - Health extension workers or health professionals?
    - Religious leaders?
    - Aid agencies/NGOs?
15. How successful have these activities been?
16. What containment measures is your community exercising to prevent the spread of coronavirus?
    - How successful have the containment measures been?
17. Are there any measures other than the ones you mentioned that could be helpful to respond to the coronavirus? Please describe.

Recovery from Coronavirus Impacts

18. In your opinion, how likely is your community to recover from the impacts of the coronavirus?
    - Why or why not?
19. Which households or groups are less likely recover from the impacts of the coronavirus?
    - How are these households different from households who are more likely to recover?
20. What are the biggest barriers to overcoming the impacts of the coronavirus on households in your community?
21. What are the opportunities or factors that support households' ability to overcome the impacts of the coronavirus?
22. Is there anything else you would like to add about community perspectives and impacts of the coronavirus that we did not cover?

Focus Group Discussion Guide (Round 2)

Shocks

1. What are the main shocks/stresses this community has experienced over the last 90 days/3 months (e.g., climate, agricultural, biological/disease, conflict, etc.)?
2. How has the community been affected by the shocks/stresses (e.g., food security, livelihoods? *Probe for:* differences between men and women? For youth? Elderly? Differences for wealthier and poorer people, etc.?
    - Effects on livelihoods/income sources?
    - Migration?
    - Social relations/networks within the community?
    - Relationships with other communities?

Household Response

3. What are the main ways that households tried to cope with the most recent shock/stress? (Probe for possible coping strategies including: migration, livelihood diversification, sold/slaughtered livestock, wage labor, ate less/lower quality food, borrowed money, etc.)
4. Over the last 90 days/3 months, how have households been supporting each other during income and/or food shortages? (Probes include: sharing food, money, labor or information; remittances; etc.)

Community Responses to Shocks/Stresses

5. What kind of collective action did the community take to deal with the shocks/stresses experienced over the last 90 days/3 months?
    - Has the collective action changed over the last 90 days/3 months (i.e., are they doing the same things now as they were doing right after the shock 3 months ago)?
    - Are people recovering? Why or why not?

Adaptations

6. In the last 90 days/3 months, what has the community done to prepare for future shocks/stresses? Probe (if not covered in response):
    - Who is involved in these activities (e.g., women, youth, elderly, etc.)?
    - Who organizes these activities?
    - How are preparations different from what the community has done in the past?
    - If nothing, why not?
7. Over the last 90 days/3 months, what have community leaders done to organize support for everyone in the community? Probe (if not included in response):
    - What support have they helped bring to the community?
    - Who benefitted from the support/who did not benefit? (probe for differences between men/women, older/younger)
    - If not, why not?

8. Was any early warning information (e.g., timely and accurate climate data, early warning, livestock, market, etc.) available in the last 90 days/3 months?
    - If so, from what source (including traditional and non-traditional sources)?
    - How did people in the community use the information? (Possible probes include: how did people learn about the upcoming shock? how did it change their behavior? etc.).

Participation in NGO programs

9. Have any government or NGO programs been helping the community (e.g., new initiatives, initiatives that ended) over the last 90 days/3 months? For each program, please describe the organization and the activities
    - How long has this program been working in the community?
    - Who participates in these activities (probe for differences between men/women, older/younger)
    - Are the activities helpful for the community?

Markets

10. How accessible is the nearest market where you buy and/or sell agricultural products (e.g., crops, vegetables, dairy products, etc.)? Probe for:
    - How far is the market? (km)
    - How often is the market open?
    - Is there public transport?
        - Who is able to take public transport?
    - Has there been a time over the last 90 days/3 months when people in this village could not access this market? Why not?
        - If yes, what did people in the village do to cope?
11. How accessible is the nearest market where you buy agricultural inputs (e.g., fertilizer, pesticide, seeds)? Probe for:
    - How far is the market? (km)
    - How often is the market open?
    - Is there public transport?
        - Who is able to take public transport?
    - Has there been a time over the last 90 days/3 months when people in this village could not access this market? Why not?
        - If yes, what did people in the village do to cope?
12. How accessible is the nearest livestock market from this village? Probe for:
    - How far is the market? (km)
    - How often is the market open?
    - Is there public transport?
        - Who is able to take public transport?

- Has there been a time over the last 90 days/3 months when people in this village could not access this market? Why not?
    - If yes, what did people in the village do to cope?

APPENDIX 3. QUALITATIVE DATA

Table 13: Disease outbreaks reported by key informants and focus groups, by county

	Sept 2019	Nov/Dec 2019	Mar/Apr 2020	June 2020	Other
Baringo	Malaria		Malaria, Typhoid, Cholera	Cholera	
Garissa	Malaria, Typhoid	Cholera	Cholera		Diarrhea, stomach problems from waterborne diseases during floods and from consuming meat from sick animals
Isiolo					Tonsillitis in children <13; three deaths (R3)
Mandera	Malaria, Typhoid, Cholera		Malaria, Typhoid, Cholera		Diarrhea (R1)
Marsabit			Malaria		Diarrhea in CU5 from consuming milk from animals with anthrax
Samburu	Typhoid, Cholera		Malaria		Diarrhea (R1,R3) Pneumonia (R1)
Tana River		Malaria			Kikungunya (Idsowe only) is recurrent; latest round started Aug 2019; Diarrhea from waterborne diseases is common.
Turkana			Malaria, Typhoid	Typhoid	
Wajir	Typhoid				

Table 14: Common stressors reported by key informants and focus groups, by county

	Pastoral Northwest			Pastoral Northeast					
	Marsabit	Turkana	Samburu	Mandera	Garissa	Wajir	Tana River	Isiolo	Baringo
Chronic poverty	x	x	x	x	x			x	
Drug or substance abuse (e.g., alcoholism, *bhang, kete, khat,* cocaine)							x	x	
Unemployment, especially among youth	x	x	x	x	x			x	
Far distance to health centers, low-quality health care, inadequate staffing/supplies at health centers	x	x	x	x	x	x	x	x	
Poor road infrastructure (worse in the rainy season)	x		x	x	x		x	x	
Far distance to markets	x		x	x			x	x	
Access to a stable water supply	x	x	x	x	x	x	x	x	
Low school enrolment due to families' inability to afford uniforms, shoes, and school supplies							x	x	
Skipping school on some days or not being able to concentrate due to lack of food at home								x	
Poor quality of education		x		x		x			

Table 15: Reasons for changes in willingness, interest or need to sell livestock reported by key informants and focus groups, by county

	Baringo	Garissa	Isiolo	Mandera	Marsabit	Samburu	Tana River	Turkana	Wajir
Reasons for more willingness, interest or need to sell livestock in past three months									
Good access to markets								R1	
Many buyers	R1								
Can be sold for a high price due to good health and weight, and/or high demand	R1							R3	
Animals are thin due to lack of water and pasture; want to reduce # animals owned		R1		R1, R3		R1 R3	R1 R2		R1
Need to pay school fees	R1 R3		R3	R3	R1 R3	R1	R2	R1 R3	R3
Need to buy food and other household consumption needs		R1	R3	R1 R3	R1	R1 R3	R1 R2 R3	R1 R3	R1
Need to purchase medicine/medicine for animals/vet services		R1 R3		R1 R3	R4	R1			
To prepare for drought	R3				R1 R3	R1 R3	R2		
Fear of theft; attacks by wild animals					R3		R1 R2		
Sell early for fear that chemicals sprayed against locusts will kill their animals									R3
Why it has been difficult to sell livestock in past three months									
Market price low because animals are thin or unhealthy, e.g., due to drought/ famine/ lack of pasture/ disease		R1 R3	R1	R1 R3	R1 R3	R1 R3	R1	R1 R3	R3
Animals are dying from drought or disease		R1 R3		R1 R3		R1 R3	R3		R1
Few buyers in market		R1 R3		R1 R3	R1 R3 R4	R1 R3			R1

	Baringo	Garissa	Isiolo	Mandera	Marsabit	Samburu	Tana River	Turkana	Wajir
		R4							
Brokers/middlemen in the market, take advantage of farmers/pastoralists		R3				R1 R4		R3*	R1
Buyers uninterested/ unwilling to buy thin/ sick animals or animals that might be ill (e.g. with foot and mouth disease)		R1		R1 R3		R1, R3	R3 R4		R1 R3
Oversupply of livestock in market								R1	
Livestock market is far away/no market/increased cost to transport animals to urban markets		R1 R3	R1 R2 R3	R1 R3 R4	R1 R3 R4	R1	R1 R2	R1	
Livestock swept away by floods; not enough to sell		R3		R3			R2	R3	
Livestock market closed due to COVID-19		R4			R4	R4	R4		R4
Other reasons for not selling livestock									
No pressure to sell: livestock are healthy and there is sufficient pasture and water								R3	
Increased social standing from owning large number of livestock					R1				
Waiting and hoping for a better price									R3
No livestock in this area; urban settlement			R1 R3						
Do not own livestock due to poverty			R1						
Only own a few livestock and prefer to keep them								R3	

*Per a KI Turkana (R3): "There are a group of people who control sale yards and they collect revenues before one takes an animal into the yard for selling. These groups of people that control activities of the sale yard are not government officials and are making it difficult for the community to sell their livestock and are diminishing their willingness. These groups started towards the end of December 2019."

Table 16: Types of household and community assistance reported by key informants and focus groups, by county

	Baringo	Garissa	Isiolo	Mandera	Marsabit	Samburu	Tana River	Turkana	Wajir
Sharing food (e.g., maize flour, rice, cooked meals)	x	x	x	x	x	x	x	x	
Participating in ceremonies such as weddings and funerals	x								
Financial contribution for burials					x	x		x	
Livestock contribution for weddings								x	
Collecting and/ or contributing funds for households experiencing shocks or emergencies and households in need	x	x	x		x	x	x	x	
Loaning/contributing money			x		x	x	x		
Contributing to school fees/medical fees						x			
Shops or roadside vendors allow purchases on credit		x	x				x		
Working together to build gabions on farms to mitigate soil erosion	x								
Repairing damaged roads						x			
Practicing land management						x			
Repairing damaged roads						x			
Visiting the sick	x								
Providing water						x			x
Providing/sharing livestock				x	x	x			x
Providing medicine for livestock						x			x
Providing firewood						x			
Contributing clothing									x
Lending a vehicle to take a sick person to a hospital			x						
Lending a *bodaboda* (motorbike) to others so they can generate income			x						
Sharing grazing land	x			x		x			

	Baringo	Garissa	Isiolo	Mandera	Marsabit	Samburu	Tana River	Turkana	Wajir
Take care of livestock for households in shock/stress						x			
Assisting in house construction					x				x

Table 17: Humanitarian assistance reported by key informants and focus groups, by county*

Source of Assistance	Notes	BARINGO	GARISSA	ISIOLO	MANDERA	MARSABIT	SAMBURU	TANARIVER	TURKANA	WAJIR
Government										
Beyond Zero campaign	County government: mobile health clinics to deal with disease outbreaks	x								
Bursary/ scholarship programs	National and county level	x	x	x						
Constituency Development Fund	With county government, supports management of irrigation scheme for food production (Tana River)	x	x					x		
Inua Jamii cash transfer program *(some KIs identified this as Inua Jamii but most did not)*	Targets the elderly, people living with disability, orphans and vulnerable children	x	x	x			x		x	x
Emergency food aid	National and county level; Turkana Oct 2019; Wajir R3, R4; Marsabit R4; Tana River, R4; Samburu R3					x	x	x	x	x
Stock silos with food to be used during dry season										
Flood mitigation	County government (Isiolo) dug a trench along a stream			x						
Food relief; food for the elderly	County government			x	x					
Inua Mama	Empowerment project for women, people living with disability, and youth; distributes resources that can be used for income generation, e.g. tents and			x						

Source of Assistance	Notes	BARINGO	GARISSA	ISIOLO	MANDERA	MARSABIT	SAMBURU	TANARIVER	TURKANA	WAJIR
	plastic chairs (to rent out for weddings/occasions), gas (for vendors of tea and cooked foods), *mkokoteni* (handcart) (for hire, to transport goods to/from market), sewing machines, barbershop accessories									
Ministry of Agriculture	Provision of fodder seed *Tana River: establishment of a scheme to produce food crops (ministry presumed, not specified)*	x						*x*		
Ministry of Agriculture	Construction of water pan and piping systems for irrigation						x		x	
Ministry of Health	Free medication			x						
Ministry of Special Programs	Food distribution to vulnerable households		x							
Ministry of Water and Irrigation	Garissa: Drilling of boreholes; purchase water for community and deliver it via water tankers; construction of earthen dams *Tana River: (ministry presumed, not specified)*		x					*x*		
National Agriculture Research Inclusive Growth Project	Started agricultural extension programs in 2020 but stopped due to COVID-19; supports women through chicken rearing and bee keeping						x		x	
Presidential Scholarship Program		x								
National Drought Management Authority	Resilience programming: purchase community members' livestock to prevent losses from their death, illnesses and weight loss; slaughter animals and paid owners for those animals and/or fed the community; provision of hay, processed feed and fodder; cash transfers to elderly, widowed, disabled persons through Hunger Safety Net Program	x		x	x	x	x			
Water provision/ trucking in water/digging boreholes	County government		x				x		x	x
Youth and Women Enterprise Funds	Loans to youths and women	x	x							

Source of Assistance	Notes	BARINGO	GARISSA	ISIOLO	MANDERA	MARSABIT	SAMBURU	TANARIVER	TURKANA	WAJIR
NGO										
ACDI/VOCA	Infrastructure improvement at the livestock market		x							
ACTED	Cash transfer program	x					x			
Action Aid	Usually comes to Baringo South whenever there are disasters like; flooding and insecurity caused by cattle rustlings	x								
Action against Hunger	Mandera R4				x					
Afya Tamiza project (AMREF Africa and IRC, supported by USAID)	• Health care/services. IRC, via AfyaTimiza, is supporting HIV-infected students in Turkana by paying their secondary school fees; also, support to orphans and vulnerable children • AMREF works on WASH via Afya Tamiza						x		x	
Catholic Diocese of Wenje	Support to development of communal farm							x		
Chalbi Community Management	Supports nutrition outreach programs					x				
Child Fund	Scholarships to children from poor families, school uniforms, books, stationery	x								
Compassion Kenya	Provides learning materials and uniforms to vulnerable children; counselling and other services during school holidays	x								
Concern Worldwide	WASH, nutrition, emergency funds, food, water and environmental conservation training, formation of savings and loan groups; cash transfers					x				
Evidence Action	Human vaccinations for elephantiasis							x		
Food for the Hungry	Water tanks, water treatment and piping; schoolbooks and uniforms, sponsorships in education; support to self-help groups					x				
German Agro Action	Crop storage facilities, drilling boreholes							x		

Source of Assistance	Notes	BARINGO	GARISSA	ISIOLO	MANDERA	MARSABIT	SAMBURU	TANARIVER	TURKANA	WAJIR
Girl Child Network	Support to girls' education, keeping girls in school; female sanitary supplies; works with Ministry of Education								x	
ILRI/Takafuu insurance	Support livestock training and covering insurance costs						x			
Islamic Relief	Mandera R4					x	x			
Kenya Dryland Education Fund	In collaboration with New Hope Children does community sensitization on COVID-19 prevention and supplies handwashing materials, soap, and masks (R4)					x				
Kenya Women Trust Fund	Supports agriculture by providing tanks					x				
Living Good	(with county government) in Turkana: recruitment of Community Health Volunteers that aid in health services provision			x						
Lokado (Lokichogio Kakuma Development Organization)	Women's savings groups; cultivation and provision of water								x	
Lutheran World Federation	Runs activities in the refugee camp; repairs water pumps								x	
Mama Ibado Foundation	Monthly food ration for the elderly; build houses for elderly			x						
Mercy Corps	Savings groups benefitting women, youth, elderly; training on life skills and WASH		x							x
Mercy Corps–Community Management Disaster Risk Reduction (CMDRR)	Drought preparedness			x						
Milgis Trust	Construction of dams/piped water in Samburu						x			
NARKI	Supports poultry processing and farming (Samburu R3)						x			
Northern Rangeland Trust (USAID)	Rangeland management; grass planting, livestock marketing					x	x			

Source of Assistance	Notes	BARINGO	GARISSA	ISIOLO	MANDERA	MARSABIT	SAMBURU	TANARIVER	TURKANA	WAJIR
	Supports the Meibai Conservancy in Samburu									
Norwegian Refugee Council	Skills training for youth		x							
Nuheri	Human rights sensitization and training							x		
Pastoralist Community Initiative and Development Assistance (PACIDA)	Water systems, WASH training, sensitization on COVID-19					x				
Red Cross	Rescues, supplies and temporary shelter during disasters; training on security; distribution of drugs to poor households; early warning of disasters; masks, soap, PPE (R4) 2017 Turkana: cash transfers to girls for education (Kenya Red Cross Society) Planting and marketing hot pepper (Tana River)	x	x					x	x	
Relief Reconstruction and Development Organization (RRDO)	Water trucking; environmental conservation; relief food distribution		x							
RUA	Constructed a dam in Isiolo			x						
Save the Children	Turkana: support to health facilities; child health/nutrition outreach services; Plumpynut Wajir: Plumpynut to malnourished children				x				x	x
SIDAI livestock centers	Social enterprise that supplies agricultural inputs and livestock services, esp. in drought context; works with Department of Agriculture			x						
Sign of Hope	Sensitization on COVID-19, provision of soap for handwashing stations (R4)					x				
Technoserve	Technical support to mango production							x		
The BOMA Project	Supports savings and loan groups					x				

Source of Assistance	Notes	BARINGO	GARISSA	ISIOLO	MANDERA	MARSABIT	SAMBURU	TANARIVER	TURKANA	WAJIR
Turkana Pastoralist Development Organization (TUPADO)	Peace and development meetings around pasture and water for livestock								x	
Veterinarians Sans Frontieres (VSF)	Animal vaccinations, provision of grass seeds, planting; mother-to-mother support groups					x				
VSO	Education program for girls who have dropped out of school			x						
Wajir South Development Association (WASDA)	Cash to locust-affected households									x
World Food Bank	Relief food distribution to vulnerable households		x		x					
World Vision	• Baringo, Marsabit: nutrition programming for young children • Baringo: cash-for-work: water pans at community level and pan-dams at household level; clearing inaccessible roads in rural areas; reclaiming eroded lands; constructing water pans; school construction • Turkana: food-for-work and farming activities; irrigation farming via food-for-work supported by WFP • Wajir: help with school fees • Isiolo: teacher education • Marsabit: women's groups, vocational training for youth, WASH, milk processing, FGM campaigns, kitchen gardens • Samburu: maternal and neonatal health services education and access; support mother-to-mother support groups, father-to-father support groups and WASH programs	x		x		x	x		x	x
OTHER										
FAO and national gov't	Locusts–pesticide spraying; mass livestock vaccinations		x						x	x

Source of Assistance	Notes	BARINGO	GARISSA	ISIOLO	MANDERA	MARSABIT	SAMBURU	TANARIVER	TURKANA	WAJIR
German International Cooperation (GIZ)	Agriculture and kitchen gardening					x				
Japan International Cooperation Agency (JICA)	Rainwater storage through water pans; planting of graze land to be used as pasture for pastoralist livestock.								x	
World Bank	Grants to small and medium enterprises in refugee-affected areas		x							
World Food Programme	Food support	x	x			x		x	x	x
USAID	BOMA–supports business education and offers loans to women groups						x			

Note: This information is not specific to survey round. Rather, it is a summary of the government, NGO and other organizational support reported in informants' recent memory. Some informants gave specific years when support started or ended, and changes across rounds, but most spoke generally regarding the assistance they were aware of in their communities.

APPENDIX 4. FOOD INSECURITY EXPERIENCE SCALE

The FIES is used to measure food security as well as changes in food security. It is an index constructed from responses to eight questions regarding people's experience with hunger.

The eight experiences are:

- Worry that the household would not have enough food.
- Any household member was not able to eat healthy and nutritious foods because of a lack of resources.
- Any household member had to eat a limited variety of foods due to a lack of resources.
- Any household member had to skip a meal due to a lack of resources.
- Any household member had to eat a smaller meal than he/she felt they needed because of a lack of resources.
- There was no food to eat of any kind in the household because of a lack of resources.
- Any household member was hungry because of a lack of resources.
- Any household member went a whole day and night without eating anything because of a lack of resources.

Survey respondents indicate whether or not they or another household member experienced the event or feeling in question in the last 30 days. A score is then calculated based on these frequency responses.

More information about the FIES indicator and its application in household surveys, is available here: http://www.fao.org/in-action/voices-of-the-hungry/background/en/

APPENDIX 5. RESILIENCE CAPACITY INDICATORS

The indicators used to measure resilience capacity in the PREG baseline were more comprehensive than those used in the RMS and are shown below.

Indicators of Resilience Capacity

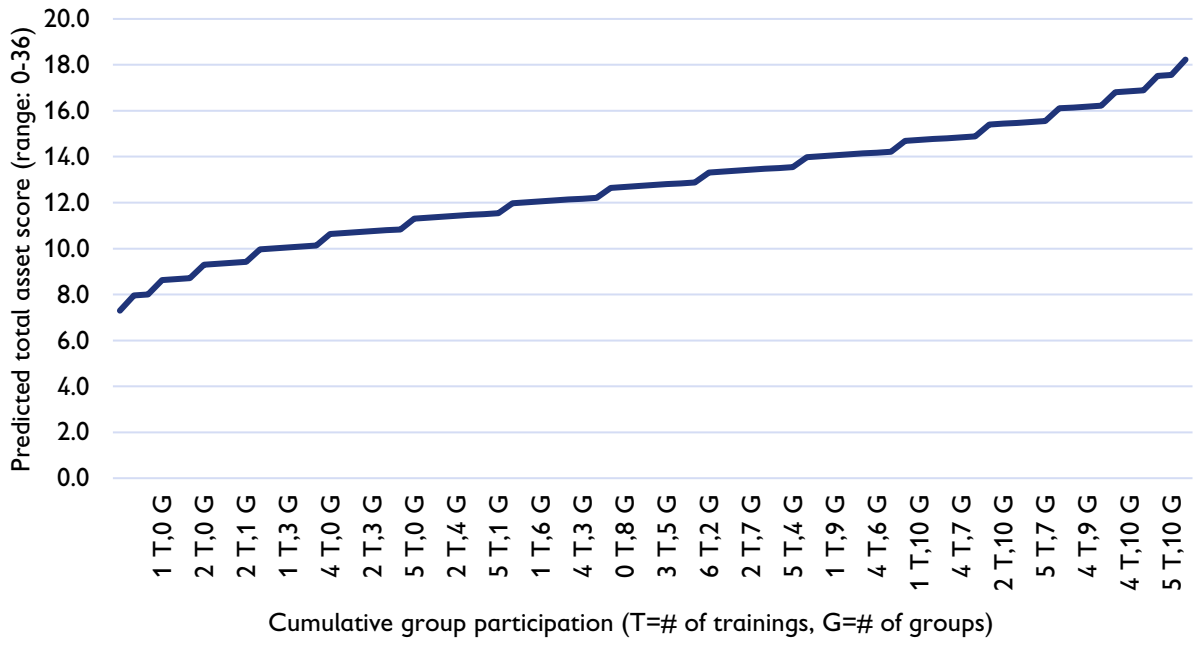
Absorptive Capacity	Adaptive Capacity	Transformative Capacity
Bonding social capital	Bridging social capital	Bridging social capital
Cash savings	Linking social capital	Linking social capital
Access to informal safety nets	Aspirations and confidence to adapt	Access to markets
Availability of hazard insurance	Livelihood diversity	Access to infrastructure
Disaster preparedness and mitigation	Access to financial resources	Access to services
Asset ownership	Human capital	Access to communal natural resources
	Exposure to information	Availability of formal safety nets
	Asset ownership	

APPENDIX 6. CUMULATIVE PARTICIPATION

As an example of what the cumulative participation variables are measuring, if a household participated in two groups throughout the first to third RMS rounds and one training in the second round of the RMS, their cumulative participation measures would look as follows:

	Cumulative group participation	Cumulative training participation
Rd 1:	2	0
Rd 2:	4	1
Rd 3:	6	1
Rd 4:	6	1

Using this example, a household that participates in two groups across three rounds and in one training (at any point in the RMS) is predicted to have a total asset score of 12 according to our model. If that same household participated in two groups across all four rounds (i.e., a full year) and in one extra training (i.e., cumulative group participation "G" = 8 and cumulative training participation = 2), this translates to a predicted asset score of 14.



APPENDIX 7: RESILIENCE INDICATORS, BY PARTICIPATION

	Did not participate	Participated	Significance	Total Sample
FIES raw score (0–8)	6.0	6.5	ns	6.2
Moderate or severe food insecurity (0–1)	78.9%	87.8%	*	82.4%
HH dietary diversity score (0–12)	5.6	6.0	ns	5.8
Confidence to cope with future shocks (0–5)	2.63	2.62	ns	2.63
Confident can cope with future shocks (0–1)	15.5%	19.7%	ns	17.1%
Don't know/unsure if can cope with future shocks (0–1)	40.9%	30.2%	**	36.6%
Not confident can cope with future shock (0–1)	43.7%	50.1%	ns	46.2%
Percent HH fem age 0–16	22.4	23.7	ns	22.9
Percent HH fem age 16–30	13.0	10.6	*	12.1
Percent HH fem age >30	15.8	15.2	ns	15.5
Percent HH male age 0–16	23.4	24.4	ns	23.8
Percent HH male age 16–30	10.6	13.4	**	11.7
Percent HH male age >30	14.9	12.7	**	14.0
Household Size	6.7	6.6	ns	6.6
Female-headed household (0–1)	20.8%	18.1%	ns	19.7%
Farming as a livelihood (at BL)	16.9%	17.9%	ns	17.3%
Livestock production as a livelihood (at BL)	61.2%	54.2%	ns	58.4%
Improved water	43.7	65.7	**	52.4
Improved sanitation	12.4	12.0	ns	12.2
Resilience capacity index (0–100)	27.6	39.9	***	32.4
Absorptive capacity index (0–100)	28.4	36.5	***	31.6
Adaptive capacity index (0–100)	30.2	39.4	***	33.8
Transformative capacity index (0–100)	22.4	31.8	***	26.1
Cumulative shock exposure index (0–251)	43.5	45.0	ns	44.1
Tropical livestock units (0–169)	6.2	4.4	*	5.5
Total asset index (0–64)	6.7	9.1	***	7.6

	Did not participate	Participated	Significance	Total Sample
HH gave assistance to others (0–1)	43.4%	69.4%	***	53.6%
HH received assistance from others (0–1)	45.6%	61.1%	***	51.7%
HH received humanitarian assistance (0–1)	27.0%	32.9%	***	29.4%
Absence of fatalism (0–4)	1.4	1.4	ns	1.4
N (observations)	1,780	1,101		2,881

APPENDIX 8. REGRESSION TABLES

Table 18: Regression results, Food Insecurity Levels Model

	Dependent variable: FIES Raw Score (range: 0–8)				
	(i)	(ii)	(iii)	(iv)	(v)
Percent HH male age 0–16	0.000395	0.000414	0.00044	0.000349	0.000395
Percent HH male age 16–30	0.00123	0.00118	0.00146	0.000937	0.00124
Percent HH male age >30	-0.000511	-0.000392	-0.000403	-0.000799	-0.000563
Percent HH fem age 0–16	-0.000016	-0000465	0.0000231	-0000494	-0000070
Percent HH fem age 16–30	-0.000619	-0.000696	-0.000417	-0.000784	-0.000704
Percent HH fem age >30	0.00353**	0.00312**	0.00363**	0.00348**	0.00353**
Household Size	0.0308	0.0301	0.0285	0.0331	0.0319
Female-headed household (0–1)	0.103	0.0888	0.0948	0.107	0.108
Farming as a livelihood (BL)	0.356*	0.322	0.434**	0.308	0.355*
Livestock production as a livelihood (BL)	0.0835	0.142	0.122	0.103	0.076
Improved water (BL)	-0.0043**	-0.0045**	-0.0045**	-0.0046**	-0.0041**
Improved sanitation (BL)	-0.0047**	-0.004*	-0.0046**	-0.0050**	-0.0047**
Urban (BL)	-0.204	-0.247	-0.265	-0.285	-0.204
Cumulative shock exposure index (0–251)	0.0287***	0.0284***	0.0287***	0.0290***	0.0289***
Tropical livestock units (0–169)	-0.028***	-0.026***	-0.028***	-0.027***	-0.028***
Total asset index (0–64)	-0.127***	-0.120***	-0.123***	-0.133***	-0.122***
HH gave assistance to others (0–1)	-0.135	-0.127	-0.129	-0.147	-0.128
HH received assistance from others (0–1)	1.006***	0.998***	0.999***	1.008***	1.003***
HH received humanitarian assistance (0–1)	0.0442	0.0389	0.0438	0.0499	0.0487
Absence of fatalism (0–2)	-0.111	-0.107	-0.109	-0.119	-0.108
RMS Round 2	-0.846***	-0.844***	-0.847***	-0.850***	-0.827***
RMS Round 3	-1.262***	-1.256***	-1.263***	-1.268***	-1.224***

	Dependent variable: FIES Raw Score (range: 0–8)				
	(i)	(ii)	(iii)	(iv)	(v)
RMS Round 4	-0.990***	-0.986***	-0.991***	-0.993***	-0.944***
GARISSA	-2.569***	-2.573***	-2.538***	-2.307***	-2.623***
ISIOLO	1.100**	1.091**	1.127**	1.251**	1.073**
MANDERA	1.990***	2.106***	1.934***	2.216***	1.923***
MARSABIT	1.846***	2.063***	1.703***	1.763***	1.933***
SAMBURU	2.489***	2.556***	2.501***	2.620***	2.532***
TANA RIVER	0.645	0.710*	0.592	0.801*	0.598
TURKANA	4.443***	4.455***	4.371***	4.598***	4.397***
WAJIR	0.752	0.666	0.787	0.960*	0.731
Resilience capacity index (0–100)	-0.0124*				-0.0117
Absorptive capacity index (0–100)		-0.020***			
Adaptive capacity index (0–100)			-0.018***		
Transformative capacity index (0–100)				-0.00336	
Cumulative participation (0–15)					-0.0695
Constant	6.274***	6.415***	6.423***	5.923***	6.249***
Observations	2891	2891	2891	2891	2891

Estimator: Random effect tobit regression; ***: $p < 0.01$, **: $p < 0.05$, *: $p < 0.10$

Table 19: Regression results, Realized Resilience Model

	Dependent variable: Change in FIES Raw Score, t–t-1 (range: -8 to +8)				
	(i)	(ii)	(iii)	(iv)	(v)
L.FIES raw score (range: -8–+8)	-0.811***	-0.813***	-0.812***	-0.811***	-0.811***
Percent HH male age 0–16	0.0000196	0.0000296	0.0000384	0.0000188	0.0000189
Percent HH male age 16–30	0.000794	0.000869*	0.000925*	0.000678	0.000796
Percent HH male age >30	-0.000608	-0.000489	-0.000527	-0.000735	-0.000626
Percent HH fem age 0–16	0.000533	0.000531	0.000544	0.000528	0.000534
Percent HH fem age 16–30	-0.000357	-0.000344	-0.000268	-0.000382	-0.000380
Percent HH fem age >30	0.00119	0.00106	0.00124	0.00115	0.00119
Household Size	0.0339*	0.0340*	0.0335*	0.0339*	0.0343*
Female-headed household (0–1)	-0.0709	-0.0765	-0.0740	-0.0758	-0.0697
Farming as a livelihood (BL)	0.146	0.150	0.178	0.132	0.145
Livestock production as a livelihood (BL)	0.00418	0.0192	0.00952	0.0249	0.00102
Improved water (BL)	-0.00176	-0.00171	-0.00175	-0.00209*	-0.00173
Improved sanitation (BL)	-0.00276*	-0.00236	-0.00266*	-0.0029**	-0.00276*
Urban (BL)	0.116	0.149	0.128	0.0300	0.115
Cumulative shock exposure index (0–251)	0.0167***	0.0164***	0.0166***	0.0170***	0.0167***
L.Tropical livestock units (t-1, range: 0–169)	-0.00528	-0.00543	-0.00562	-0.00446	-0.00546
L.Total asset index (t-1, range: 0–64)	-0.101***	-0.095***	-0.098***	-0.103***	-0.099***
HH gave assistance to others (0–1)	-0.263***	-0.245**	-0.255***	-0.271***	-0.259***
HH received assistance from others (0–1)	0.687***	0.683***	0.684***	0.684***	0.688***
HH received humanitarian assistance (0–1)	0.101	0.104	0.1000	0.0999	0.102
Absence of fatalism (0–2)	-0.0232	-0.0178	-0.0191	-0.0282	-0.0227
RMS Round 3	0.0766	0.0786	0.0761	0.0720	0.0826
RMS Round 4	0.139	0.144	0.139	0.133	0.148
GARISSA	-2.003***	-2.121***	-2.069***	-1.805***	-2.018***
ISIOLO	0.592	0.518	0.560	0.720	0.588

	Dependent variable: Change in FIES Raw Score, t–t-1 (range: -8 to +8)				
	(i)	(ii)	(iii)	(iv)	(v)
MANDERA	0.973***	0.931***	0.900***	1.129***	0.956***
MARSABIT	1.340***	1.446***	1.322***	1.363***	1.371***
SAMBURU	1.363***	1.326***	1.327***	1.508***	1.376***
TANA RIVER	0.815**	0.777**	0.761**	0.924***	0.803**
TURKANA	1.788***	1.725***	1.732***	1.920***	1.778***
WAJIR	0.766**	0.658*	0.723**	0.909**	0.763**
Resilience capacity index (0–100)	-0.000819				-0.000670
Absorptive capacity index (0–100)		-0.0074**			
Adaptive capacity index (0–100)			-0.00474		
Transformative capacity index (0–100)				0.00488	
Cumulative participation (0–15)					-0.0182
Constant	3.573***	3.769***	3.707***	3.349***	3.570***
Observations	2,037	2,037	2,037	2,037	2,037
R-squared	0.467	0.468	0.468	0.468	0.467

Estimator: Random effect GLS regression; ***: $p < 0.01$, **: $p < 0.05$, *: $p < 0.10$
Standard Errors are robust to clustering

Table 20: Regression results, Perceived Resilience Model

	Dependent variable: Confidence to adapt to future shocks (range: 1-5)				
	(i)	(ii)	(iii)	(iv)	(v)
Percent HH male age 0–16	0.000114	0.000126	0.000108	0.000138	0.000107
Percent HH male age 16–30	0.000252	0.000394	0.000236	0.000367	0.000255
Percent HH male age >30	-0.00126**	-0.00116**	-0.00122**	-0.0012**	-0.00125**
Percent HH fem age 0–16	-0.0000286	-0.0000086	-0.0000346	-0.000017	-0.0000314
Percent HH fem age 16–30	0.0000616	0.000147	0.0000163	0.000152	0.0000960
Percent HH fem age >30	-0.00101**	-0.000871*	-0.00104**	-0.0010**	-0.00101**
Household Size	-0.0173*	-0.0181*	-0.0169*	-0.0182*	-0.0170*
Female-headed household (0–1)	-0.174**	-0.170**	-0.170**	-0.179**	-0.176**
Farming as a livelihood (BL)	-0.0643	-0.0370	-0.0822	-0.0428	-0.0627
Livestock production as a livelihood (BL)	-0.165***	-0.191***	-0.186***	-0.161***	-0.161***
Improved water (BL)	-0.000761	-0.000519	-0.000536	-0.000788	-0.000828
Improved sanitation (BL)	0.000399	0.000368	0.000482	0.000549	0.000414
Urban (BL)	-0.0644	-0.00484	-0.00638	-0.0636	-0.0621
Cumulative shock exposure index (0–251)	0.000140	0.0000784	0.0000449	0.0000975	0.000122
Tropical livestock units (0–169)	0.00478*	0.00375	0.00434	0.00444*	0.00504*
Total asset index (0–64)	0.0250***	0.0258***	0.0251***	0.0283***	0.0198***
HH gave assistance to others (0–1)	0.423***	0.425***	0.423***	0.427***	0.415***
HH received assistance from others (0–1)	-0.0268	-0.0244	-0.0235	-0.0289	-0.0340
HH received humanitarian assistance (0–1)	-0.0302	-0.0306	-0.0299	-0.0336	-0.0328
Absence of fatalism (0–2)	-0.146***	-0.144***	-0.145***	-0.143***	-0.143***
RMS Round 1	0	0	0	0	0
RMS Round 2	-0.0488	-0.0466	-0.0465	-0.0488	-0.0378
RMS Round 3	-0.118*	-0.116*	-0.114*	-0.118*	-0.108
RMS Round 4	-0.218***	-0.217***	-0.215***	-0.220***	-0.196**
GARISSA	0.527***	0.392**	0.427**	0.484**	0.548***

	Dependent variable: Confidence to adapt to future shocks (range: 1-5)				
	(i)	(ii)	(iii)	(iv)	(v)
ISIOLO	-0.0686	-0.149	-0.133	-0.0833	-0.0658
MANDERA	0.425**	0.279	0.375**	0.382**	0.448**
MARSABIT	-0.991***	-1.028***	-0.924***	-0.917***	-1.060***
SAMBURU	-0.235	-0.330*	-0.289*	-0.228	-0.265
TANA RIVER	0.226	0.128	0.197	0.199	0.242
TURKANA	-0.841***	-0.930***	-0.873***	-0.858***	-0.840***
WAJIR	0.310	0.228	0.231	0.275	0.316
Resilience capacity index (0–100)	0.00765***				0.00754***
Absorptive capacity index (0–100)		0.00529***			
Adaptive capacity index (0–100)			0.00704***		
Transformative capacity index (0–100)				0.00532**	
Count of types of participation (0–7)					0.103***
Constant	-1.522***	-1.656***	-1.566***	-1.599***	-1.526***
Observations	2897	2897	2897	2897	2897

Estimator: Random effects ordered probit; ***: $p < 0.01$, **: $p < 0.05$, *: $p < 0.10$
Standard Errors are robust to clustering

Table 21: Regression results, Food Insecurity Levels IV Model

	DV: Total Asset Score	DV: FIES Raw Score (0–8)
Total asset index (0–64)		-0.250***
Percent HH male age 0–16	-0.00197**	0.0000584
Percent HH male age 16–30	-0.00135	0.000630
Percent HH male age >30	0.000974	-0.00117
Percent HH fem age 0–16	0.000500	-0.000000353
Percent HH fem age 16–30	0.00271	-0.000662
Percent HH fem age >30	-0.00216	0.00263*
Household Size	0.176***	0.0665*
Female-headed household (0–1)	-0.570*	0.0494
Farming as a livelihood (BL)	0.775**	0.404*
Livestock production as a livelihood (BL)	-0.00805	0.107
Improved water (BL)	0.00503*	-0.00336
Improved sanitation (BL)	0.00626	-0.00459*
Urban (BL)	0.975**	0.0485
Resilience capacity index (0–100)	0.0843***	0.00339
Cumulative shock exposure index (0–251)	0.00596	0.0357***
L.Tropical livestock units (t-1, range: 0–169)	0.0514***	-0.00887
HH gave assistance to others (0–1)	1.403***	-0.109
HH received assistance from others (0–1)	-0.263	1.081***
HH received humanitarian assistance (0–1)	0.0976	0.00328
Absence of fatalism (0–2)	0.215**	-0.162
Round 2	-0.0729	-1.113***
Round 3	-0.365*	-1.460***
Round 4	0.151	-1.178***
GARISSA	-3.446***	-2.967***
ISIOLO	-2.201**	0.663
MANDERA	-2.765***	1.384**

	DV: Total Asset Score	DV: FIES Raw Score (0–8)
MARSABIT	-8.171***	0.855
SAMBURU	-3.213***	2.344***
TANA RIVER	-2.925***	0.358
TURKANA	-5.100***	3.792***
WAJIR	-2.946***	0.148
Cumulative group participation (0–10)	0.662***	
Cumulative training participation (0–6)	0.720***	
Constant	5.181***	6.806***
Over identification restriction test (p < chi-sq(1))		0.34
Observations	2,764	2,764

Note: the over identification test used is the Amemiya-Lee-Newey chi-square statistic; null: instruments are valid
Estimator: IV Probit (probit with endogenous regressors); ***: p < 0.01, **: p < 0.05, *: p < 0.10
Standard Errors are robust to clustering

Table 22: Regression results, Perceived Resilience IV Model

	First Stage	Second Stage
	DV: Total Asset Score	DV: Confidence to Adapt (0–1)
Total asset index (0–64)		0.0698**
Percent HH male age 0–16	-0.00199**	0.000356
Percent HH male age 16–30	-0.00133	0.000349
Percent HH male age >30	0.000827	-0.000287
Percent HH fem age 0–16	0.000507	-0.000215
Percent HH fem age 16–30	0.00253	-0.000499
Percent HH fem age >30	-0.00226	-0.00112*
Household Size	0.176***	-0.0485***
Female-headed household (0–1)	-0.574*	-0.104
Farming as a livelihood (BL)	0.781**	-0.0582
Livestock production as a livelihood (BL)	0.00664	-0.181**
Improved water (BL)	0.00513**	-0.000323
Improved sanitation (BL)	0.00630*	0.00105
Urban (BL)	0.968**	-0.196
Resilience capacity index (0–100)	0.0845***	0.00241
Cumulative shock exposure index (0–251)	0.00594	0.00102
L.Tropical livestock units (t-1, range: 0–169)	0.0511***	-0.00183
HH gave assistance to others (0–1)	1.400***	0.376***
HH received assistance from others (0–1)	-0.257	-0.152**
HH received humanitarian assistance (0–1)	0.110	-0.0627
Absence of fatalism (0–2)	0.212**	-0.0652
Round 2	-0.0740	-0.168**
Round 3	-0.356	-0.0794
Round 4	0.157	-0.231**
GARISSA	-3.445***	-0.233
ISIOLO	-2.213**	-0.927***
MANDERA	-2.772***	-0.124

	First Stage	Second Stage
	DV: Total Asset Score	DV: Confidence to Adapt (0–1)
MARSABIT	-8.188***	-0.891***
SAMBURU	-3.210***	-0.490***
TANA RIVER	-2.940***	-0.294
TURKANA	-5.105***	-0.595**
WAJIR	-2.956***	-0.166
Cumulative group participation (0–10)	0.674***	
Cumulative training participation (0–6)	0.694***	
Constant	5.190***	-0.606**
Over identification restriction test (p < chi-sq(1))		0.39
Observations	2,769	2,769

Note: the over identification test used is the Amemiya-Lee-Newey chi-square statistic; null: instruments are valid
Estimator: IV Probit (probit with endogenous regressors); ***: p < 0.01, **: p < 0.05, *: p < 0.10
Standard Errors are robust to clustering

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.

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