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Somalia Resilience Program

Positive Deviance in Somalia: Why are some households more resilient than others?

September 2018

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Somalia Resilience Program

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Errors and opinions are those of the authors.

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Acronyms and Abbreviations

CAHW	Community Animal Health Worker
CATI	Computer-assisted Telephone Interviewing
CBDRM	Community-based Disaster Risk Management
CfW	Cash for Work
EWEA	Early Warning Early Action
FCS	Food Consumption Score
FGD	Focus Group Discussion
HFIAP	Household Food Insecurity Access Prevalence
HFIAS	Household Food Insecurity Access Scale
HHS	Household Hunger Scale
IDP	Internally Displaced Persons
KI	Key Informant
ODK	Open Data Kit
PD	Positive Deviance
rCSI	reduced Coping Strategies Index
SG	Savings Group
VSLA	Village Savings and Loans Association

Positive Deviance Study Highlights

Those people who had better food security and well-being outcomes were most likely to belong to a Savings Group scheme and to have participated in a Cash for Work scheme.

This was followed closely by the next most associated characteristic, which was to have communicated regularly with someone outside of the village; this is an example of bridging social capital. (This relationship was the most significant in the study, when the association with food security on its own was assessed.)

General Characteristics of Positive Deviants

- better off socio-economically
- better access to program activities
- better able to liquidate livestock in response to the drought, probably earlier in the drought cycle
- more likely to be food secure and especially more likely to report that they are not experiencing hunger
- had larger households
- owned mattresses and improved roof materials
- higher education of female head or female at head level (spouse)

General Findings

Belonging to a Savings Group and participating in preparedness and early warning activities were consistently related to both community identification of successful coping as well as food security status.

The more, high impact interventions implemented in villages and benefiting households, the higher the food security status.

Selling livestock, slaughtering livestock, not migrating, not taking children out of school, taking out a loan from a source other than the VSLA and receipt of food aid were all associated with adequate food consumption.

Agro-pastoralists had better well-being outcomes than others and Internally-Displaced Persons (IDPs) had the worst.

Education of the senior female (head or spouse of head) was consistently associated with somewhat improved food security and recovery indicators.

Food consumption was most frequently adequate among those relying on aid as their primary income source, followed by salaried workers and agro-pastoralists.

The number of livelihood sources was strongly related to a positive Food Consumption Score.

Findings for Further Discussion

Need for thresholds for graduated program approach

SomReP programs were insufficiently shock responsive which was found to have negative impacts on the functioning of Savings Groups and food security. CfW was not provided for long enough and beneficiaries were not able to contribute adequately to Savings Group schemes. Given that membership to a VSLA is a first step in the anticipated linear progression towards economic growth and commensurate enhanced resilience, it is crucial that beneficiaries are able to participate. If beneficiaries have not sufficiently recovered to be able to contribute to a Savings Group, focus on this activity without enough time spent receiving CfW could in fact make communities poorer.

SG members and some community members (in Dollow) noted that the VSLAs were not sufficient, in the face of this large co-variate shock, to cope with its effects. In Dollow, some SGs were disbanded because people no longer had the ability to save. Many SG participants stressed that CFW and cash grants were needed for them to successfully mitigate the drought's effects.

Study respondents were concerned that humanitarian assistance was being replaced by resilience programs. They did not feel that resilience projects without humanitarian aid could prevent them from recidivism and some noted that humanitarian aid was not sufficient or timely.

SomReP should sequence, layer and target interventions to ensure that the most needy can embark on resilience pathways. CFW should be explored as it is a very popular intervention in rural communities because it both puts resources in the hands of the poorest while building community assets to improve water access and natural resources management.

SomReP should conduct a study to determine thresholds in the amount and timing of various high impact interventions in different segments of its target population, namely; IDPs, pastoralists, agro-pastoralists, peri-urban, the poorest segment of community. Through this type of work, SomReP should be able to better target and layer its interventions to help different beneficiary groups enter on and graduate from resilience building programs.

Are the needs of most vulnerable being met?

Study respondents were concerned that VSLAs do not reach the most vulnerable in program targeted communities. Only those households who can afford to save seek membership. So, while VSLAs did benefit families and communities in which they were established, given the low coverage of households in targeted communities, additional effort is needed to ensure needs of the most vulnerable are met.

Similarly, targeting for other high impact interventions did not appear to be sufficiently deliberate nor was there a clear vision of the anticipated end state of SomReP targeted communities.

Multiple roles and Importance of Savings Groups

Universally, SG participants felt that SGs built social capital, self-esteem and empowered them. SG groups provided a mechanism for self-help to exchange ideas, expertise and other resources. For some, it was a place where they could relieve stress through group interactions. Most participants took pride in their ability, through the social fund component of the VSLA, to help the neediest in the community. This elevated their self-esteem, their status in the community, including their newly acquired credit-worthiness. One SG FGD in Odweyne summed it up that they would advise others to join VSLAs rather than relying on clan insurance because **"VSLA's share profit and opportunity".**

The VSLA activity also was felt to be a successful capacity development activity, particularly for women: **"we may have little formal education but have taken part in capacity building workshops as members of VSLA groups"**. The capacity building nature of the VSLA activity surfaced in more than half of the discussions focused on SGs.

The Complexity of Assessing Coping Strategies

These data suggest that in this sample, some coping actions taken by households reflected the severity of their situations. Moving livestock in search of pasture and human migration appeared to be late stage actions, where animals were moved, like people, when the situation became dire. Similarly, taking children out of school appeared to be a later stage action taken. On the other hand, selling and slaughtering livestock, though associated with increased coping in general, were associated with better food security outcomes. These findings are mostly consistent with the qualitative inquiry that suggested diversified livelihoods and selling and slaughtering livestock were all important for resilience. However, the qualitative assessment pointed to moving livestock in search of pasture as a positive coping strategy. It does not appear to be the case in the quantitative analysis. Perhaps this may be because this action was taken too late.

Executive Summary

Over the last two decades, Somalia has witnessed a rise in both the frequency and magnitude of humanitarian crises induced by a combination of hazards and stresses, including drought, conflict, poverty and a fragile economy. Following failed rains in 2016 and below-average Gu rains from March-June of 2017, much of the country faced widespread and prolonged drought conditions with severe humanitarian consequences (FSNAU, 2017a). As of July 2017, the Food Security and Nutrition Analysis Unit (FSNAU) estimated that 3.3 million people were in crisis and emergency (IPC phase 3 and 4) with an additional 2.9 million people in stress (IPC phase 2) (FSNAU, 2017b). The situation improved in 2018 due to above average rainfall and humanitarian assistance (FSNAU, 2018).

Anecdotal field observations from program staff suggested that some households and communities were coping more successfully than others with the severe climate shocks. Program staff also observed that members of Savings Groups (these are called Village Savings and Loans Associations (VSLAs) in the SomReP context) appeared to be engaging in entrepreneurial activities and community relief work, such as hosting displaced persons. SomReP commissioned this research to more systematically explore the relationship between resilience program exposures and well-being outcomes such as food security and self-reported recovery from recent shocks in the districts of Badhan, Dollow, Erigavo, Eyl, Luuq and Odweyne. The study applied a Positive Deviance (PD) framework for analyzing correlates of successful coping or resilience.

Research Design

The research design employed multiple methods for exploring the hypothesis that program exposure contributed to successful food security outcomes and recovery. Given the lack of adequate counterfactuals (no baseline or comparison groups), this evaluation used convergence of evidence as opposed to attribution analytical strategies. The research was organized under a Positive Deviance (PD) framework. PD inquiry is particularly suited for contexts like Somalia, where severe poverty is prevalent, but a minority of communities and households can achieve well-being. The goal of a PD inquiry is to identify the positive outcomes of interest, such as food security and disaster recovery and work backwards to explore possible determinants. This study combined community perceptions of positive deviance through qualitative inquiry with a quantitative household survey that measured outcomes reflecting household resilience. These outcomes included various measures of food security and self-reported recovery from the recent drought. The research explored mechanisms through which program exposure contributed to improved capacities of households and communities to manage recent shocks. The field methodology included qualitative focus group discussions (FGDs), key informant interviews (KIIs) and a mobile phone survey. A unique aspect of this study is that a proportion of the PD households were included in the quantitative household survey and therefore could be compared quantitatively with their village peers not identified as PDs.

Villages in project areas were stratified into four program intensity strata to ensure that the study sample reflected sufficient variability in program exposures. SomReP staff identified what they hypothesized to be high impact interventions. These included Savings Groups (Village Savings and Loans Associations (VSLAs)); Community Animal Health Workers (CAHWs), interventions focused on improving water for human consumption and livelihood production; and Early Warning Early Action (EWEA) committees or Community-based Disaster Risk Management (CBDRM) systems. VSLAs were hypothesized to be particularly high impact. Forty (40) villages were selected based upon probability proportional to size. A sample of households from each stratum was randomly drawn from a listing of cell phone numbers in all villages selected in the first stage of the sample design. Surveys were conducted through a live operator cell phone interview, a process called Computer-Assisted Telephone Interviewing (CATI). Previous survey results suggested that cell phone coverage was very high in Somalia/Somaliland project areas[5], though two (2) of the districts included in this study reportedly had cell coverage rates less than 50 percent, which resulted in unknown selection bias, a limitation of this study.

[5] TANGO International, 2017.

The household survey instrument collected a variety of measures related to background socio-demographic measures, exposure to shocks, coping strategies employed, self-reported recovery, awareness and self-reported participation in project activities, subjective food insecurity scales and a food consumption measure.

The study included more than 2,300 participants in 40 communities. Forty-three (43) focus group discussions (FGDs) and 27 key informant interviews (KIIs) were held in 21 communities across the six (6) districts. Two thousand one hundred and seventy-five (2,175) households participated in the household survey with a response rate of 40.52 percent.

Analytical Strategy

The analytical strategy first identified community perceptions of resilient/positive deviant households and communities. Then, hypotheses relating community identified positive deviance to food security and recovery were compared quantitatively. Exploratory analysis of the household survey data showed that Cash for Work (CFW) was also associated with improved food security. The exploratory phase also revealed that exposures to high impact programs were additive, suggesting that intensity was best measured by the number of interventions as opposed to specific types of high impact interventions. Separate models measured programs exposures at the household and community levels. Given the observational nature of the study and likely selection bias (program participants are different from non-participants), propensity score matching was employed as a final step of the analysis to strengthen inference regarding program effects.

Key Findings

The findings from this sample are consistent with other assessments conducted during the time period of the study in that they illustrate the devastation of the large covariate drought shock together with its cascading sequelae of price, animal and human health effects. Virtually all households reported having been affected by the drought. Most the households and informants rated the drought as very serious or the worst they had ever experienced. Food security indicators showed that a minority of the households in the sample were food secure. Only a small percentage of the respondents felt that they had recovered from the shock. On average, households reported experiencing a mean of 3.37 shocks during the past year.

Nevertheless, some households could maintain or achieve food security or were considered to be PD by themselves and others in terms of their capacity to cope with this widespread crisis. Results from the qualitative inquiry suggest that there was a good understanding in program areas of the nature of resilience as the ability to successfully prepare for and management shocks such as droughts and floods. They saw the proof of resilience as being able to maintain or rapidly restore livelihood assets required to achieve or maintain health and well-being. Diversified livelihoods, savings, access to water, markets and health services were all identified as important determinants of resilience.

The key findings of this study showed that those households with better food security and coping ability were more likely to belong to a Savings Group and to have participated in Cash for Work in the last year. The other characteristic which demonstrated the most significant association with better outcomes was to communicate regularly with someone outside the village of the respondent.

Community perceptions of positive deviance were associated with well-being measures such as socio-economic and food security outcomes as reflected by the household survey; however, the associations were not strong, suggesting that qualitative and quantitative approaches are capturing somewhat different signals of resilience or that the sample size of community identified PDs was not sufficiently large or representative. Those individuals identified as PD by other community members saw PDs as wealthier, better prepared and able to draw on multiple livelihood strategies to cope, better able to access loans and credit, and with strong family and diaspora support. They also were identified as agro-pastoralists. Survey data suggested that PDs were somewhat socio-economically advantaged in their communities, but PDs did not differ greatly (if at all) from those not identified by PD. However, these factors were all strongly associated with food security.

The PD perspective provided additional insights in to the determinants of resilience. Though PD discussions confirmed the importance of assets and livelihoods they also stressed important psychosocial determinants of success such as optimism, entrepreneurialism, not being discouraged by loss of assets, strong community and familial social networks, and having a culture of preparedness and savings. They consistently identified the awareness of and ability to access NGO and humanitarian programs as an important determinant of success.

Savings Group Schemes

Given the initial hypothesis of this study around the potential significance of VSLAs for building resilience, the qualitative inquiry specifically probed study participants about the utility and impacts of VSLAs for resilience. VSLAs were viewed as high impact interventions that allowed members to finance livelihood diversification and drought mitigation measures, with many specific examples given by community members and VSLA members. However, many VSLA members and some community members, in Dollow in particular, noted that VSLAs were not sufficient in the face of this large co-variate shock to cope with its effects. In Dollow, at least one VSLA was disbanded because members could no longer save. Many VSLA participants stressed that CFW and cash grants were needed for them to mitigate the drought's effects.

Universally, participants felt that VSLAs built social capital, self- esteem and empowerment. VSLA groups provided a mechanism or self- help platform for exchanging ideas and expertise. For some, it was a place where they could share and relieve their psychological stress. Most participants took pride in their ability, through the social fund component of the VSLA, to help the neediest in the community. This elevated their self-esteem together with their newly acquired credit-worthiness.

In addition to livelihood strengthening, participants identified social capital development through the VSLAs and through NGO efforts to strengthen local governance as very important. Drought Rescue Committees and other drought management committees were repeatedly mentioned as important. They conferred credibility to local governance. These forms of social capital are particularly important in Somalia where social dependency on clans is prominent. One VSLA focus group member indicated that "VSLAs were better insurance than clans".

Program Exposure

Participants in the qualitative inquiry prioritized SomReP interventions differently per their livelihood sources and available assets, though savings groups, access to water and to sources of cash/food were universal concerns. Almost all participants signaled the need for multiple interventions, suggesting that specific interventions provided by SomReP were well appreciated but that more was needed. Numerous examples were given during interviews and FGDs of the need for greater layering of interventions at the household level and recognition of the need for humanitarian assistance.

The household survey data mirrored these findings whether program exposures were measured at the household or village levels. Household level exposures reflected the participation of households in various high impact program interventions. Village level exposure merely reflected the fact that households lived in a village where SomReP was implementing different program activities. Both levels of exposure were viewed as important because the hypothesized effects of different interventions can be either direct or indirect.

Models predicting positive food security outcomes identified program exposures as additive on PD, much as the qualitative inquiry concluded. CFW also contributed to food security above and beyond the effects of other high impact programs. The principal finding was that more was better, and this held for different types of households, different livelihood groups, and different experiences with the severity of drought. The effect persisted after selection bias related to differential participation had been taken in to account using Propensity Score Matching.

Though the relationship with various outcomes and interventions was in a consistent direction, the food consumption score (FCS) showed the strongest and most significant relationship across the analyses. Predicting the outcomes as food secure/versus insecure did not perform better than modelling the food security mean score. However, the analysis showed clearly that when households were exposed to multiple high impact interventions, food security could be achieved. The finding that the Household Hunger Score better differentiated PDs should be followed up in future research.

The village level analysis showed very similar results reflecting that households identified as being in high impact intervention villages had superior food security outcomes and the improvements in outcomes were linear with the number of high impact outcomes that were offered in the village/community

The analysis also looked at possible mechanisms through which program exposures mitigated the impact of the crisis, through both dampening the severity of shocks or improving coping behavior. Both assessments pointed to the need for contingency livestock management practices, planting and storing food, livelihood diversification and timely humanitarian assistance.

A concerning finding was the low level of awareness of and participation in SomReP interventions. Household awareness of SomReP partner agency interventions varied greatly across interventions and villages; however, it averaged below 40% and was as low as 10% of households in one district. Household participation in interventions also varied greatly across villages and districts, but it didn't exceed 28%

for any single intervention. 52.2% of households didn't participate in any SomReP high impact activity programs. This is an important finding for SomReP.

Conclusions and Recommendations

This study supports the conclusion that SomReP's programming is building resilience and that it made a difference for targeted households and communities during the last drought. It is clear that intensity of exposure, as reflected by access to multiple interventions was needed to achieve food security during the drought.

But the study has several limitations. The quantitative component of the study is based on a cross-sectional survey. This made it very difficult to establish a rigorous counterfactual because of likely selection bias and difficulty in establishing temporal ordering of cause and effect. To compensate for this, Propensity Score Matching (PSM) was used; however, unobserved variables are still a potential threat to the validity of the findings.

Another concern is that the sampling frame was based on households possessing cell phones. Here again, households in this frame are likely to differ from the target population in systematic ways. That these households are somewhat wealthier has been confirmed in Somalia (TANGO International, 2018). Many of these same factors have been included in the PSM, however, to mitigate the effects of selection bias.

The research team found inconsistencies in data about where project activities were being implemented and could not obtain information about the amounts and quality of programs. For example, basic data on the quantity of savings and loan distributions were not available to corroborate findings that VSLAs were contributing to food security improvements. As has been found elsewhere, the lack of meaningful program exposure and process information is a major impediment to sound evaluation of resilience building interventions.

However, despite its limitations, the findings from the different components of this study converge on important conclusions. **SomReP's focus on savings and loans, livelihood strengthening/diversification, water, and social capital building/local institutional strengthening for disaster preparedness has both great relevance and potential for launching Somali households on resilience trajectories.** This conclusion is consistent with the broader literature on the effects of resilience-oriented programming and from recent data collected in Somalia (TANGO International, 2018).

One area for improvement is program coverage and community awareness of SomReP programs.

The study also suggests that SomReP should have a more vigorous focus on shock responsive programming. As has been found elsewhere, resilience programs mitigate the effects of shocks; however, their impact on resilience trajectories can be faster and more effective with more careful sequencing and layering of program interventions and emphasis on rapid deployment of safety net resources to protect their investments. **Both the qualitative and quantitative findings indicate that SomReP activities were not sufficient to prevent food insecurity.**

This research also points to the need for additional improvements in field research quality control. Several inconsistencies within the data set can be eliminated in the future with more careful formulation and testing of data collection instruments, improved training and increased supervision. Additional research also is needed to identify and adjust for selection and other forms of bias introduced by mobile survey methods.

Section I: Introduction

SomReP Overview

Following the experience with 2011 famine, a consortium of seven (7) internationals NGOs (ACF, ADRA, CARE, COOPI, DRC, Oxfam and World Vision) came together to form SomReP (The Somalia Resilience Program). The objective of this initiative was to collaboratively design and implement a program aimed at enhancing the capacities of vulnerable populations in Somalia to both respond to droughts immediately and enhance long-term resilience in some of the hardest hit regions across Somalia/Somaliland.

SomReP defines resilience as "the ability of communities and households to manage change, by maintaining or transforming living standards in the face of shocks or stresses – particularly recurrent drought – without compromising their long-term prospects"[6].

To achieve these objectives, SomReP programming supports resilience through:

- Enhancing livelihood diversification and improved access to markets, financial services and basic livelihood services (adaptive capacity),
- Fostering collective community action for effective disaster risk management, the adoption of positive coping strategies and improved access to formal and informal safety nets (absorptive capacity),
- Strengthening equitable and sustainable natural resource management, and
- Improving community governance for transformative capacity.

Further, SomReP projects, and the Consortium seek to generate learning, research and reflection about resilience from community members, NGOs and governments to support adaptive management. The SomReP unified log frame is in Annex 1.

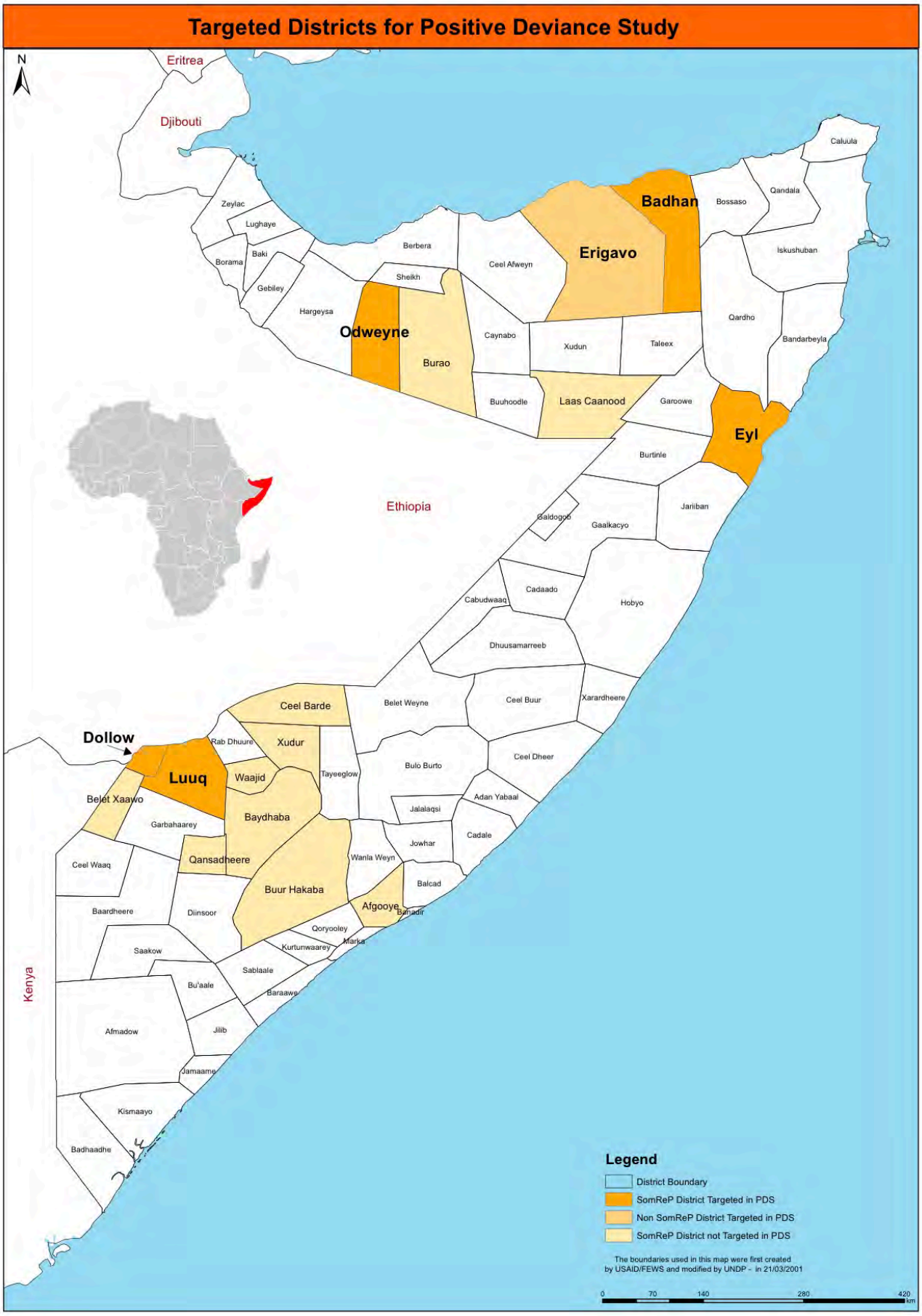
Study Areas

The study was implemented in six (6) districts, illustrated in the map below (Figure 1). The organizations working under the SomReP umbrella that supported each district are:

- Badhan – CARE,
- Erigavo – CARE (through the USAID-funded Somalia/Somaliland Towards Reaching Resilience (STORRE) project),
- Odweyne – World Vision,
- Eyl – Action Against Hunger (ACF),
- Dollow – Danish Refugee Council (DRC) and Cooperazione Internazionale (COOPI), and
- Luuq – World Vision (particularly the USAID-funded Resilience and Economic Activity in Luuq (REAL) project).

[6] SomReP. 2016. Somalia Resilience Program: Proposal for Enhancing Resilience in Somalia (2013-2019). World Vision Somalia. Nairobi. August 2016.

Figure 1: Map of Targeted Districts



Objectives of the Research and Research Questions

During the year prior to the study, reports from staff and partners in the field suggested that beneficiaries of SomReP interventions displayed proactive household and community actions such as using loans to enhance their livelihoods and hosting drought-affected people; providing shelter and humanitarian assistance that allowed Internally Displaced Persons (IDPs) to survive the consequences of droughts and acute food distress. At the same time, SomReP senior managers wanted to more systematically assess the impact of SomReP investments on the resilience in program target areas.

The purpose of this study was to provide a more systematic evidence base on the effects of SomReP program interventions on household well-being as well as to explore the pathways through which programs may operate to empower households and communities to manage shocks and risks. This research had the following objectives:

1. To identify the characteristics of households and communities that could maintain food security and recovery quickly from the recent drought shock

2. To assess the relationship between exposures to SomReP interventions and household well-being outcomes

3. To better understand the pathways to resilience, and

4. To provide recommendations for future research and program intervention strategies to improve the resilience of Somali households and communities.

Organization of the Report

This report is organized into (9) nine sections as follows:

- Section I introduces the study,
- Section II describes the research design and methodology,
- Sections III-VI describe the characteristics of the household survey sample and the shock, coping and well-being of the household survey sample,
- Section VII analyzes the relationship between SomReP program exposures and well-being outcomes,
- Section VIII analyzes the exposure of households to SomReP interventions,
- Section IX postulates potential conclusions and recommendations, and
- Supporting materials are provided as Annexes.

Section II: Research Design and Methods

This study is motivated by learning from a large covariate shock event, how affected people respond and about whether SomReP interventions were helping households and communities to achieve resilience. While the intent of interventions is to build the capacities of households/communities to respond to drought and other shocks; it is only when these capacities are put to the test, that resilience can be observed (Constas et al., 2014). The severe drought that affected most of Somalia and culminated in 2017 was just that test.

Rigorously testing the impact of SomReP programs in target areas was challenged by the lack of an *a priori* evaluation strategy that provided baseline data and proper comparison groups. Because of this research context, this research employed multiple methods, a convergence of evidence approach as well as advanced statistical techniques.

The framework for this research design is Positive Deviance (PD). Positive Deviance is a concept that is widely used in international development research derived from nutritional studies beginning in the late 1960s and early 1970s. Researchers recognized that even in communities where most families live in poverty and experience malnutrition, some families/caretakers had well-nourished children (Berggren & Wray, 2002; Walzer, 2002). PD is particularly useful in the study of resilience because this type of assessment addresses problems that: (1) are enmeshed in a complex social system, (2) require social and behavioral change, and (3) entail solutions that are rife with unforeseeable or unintended consequences. Furthermore, in the wake of large covariate shocks affecting highly vulnerable populations, surprisingly, a minority of the population can achieve and sustain well-being, such as food security. PD frameworks provide a fresh alternative when problems are viewed as intractable (Pascale et al., 2010). By engaging with the positive outliers in a community to identify locally effective innovative solutions, successful approaches can by "amplified" in the broader community to engender community level behavioral and social change (Tuhus-Dubrow, 2009; Pascale et al., 2010; Singhal & Dura, 2012). An Interagency Technical Working Group (Constas et al., 2014) advocates for the importance of PD research for building an evidence base around resilience.

"The concept is simple: look for outliers who succeed against all odds." (Pascale et al., 2010))

PDs were defined using two different methods; a qualitative community perception assessment and a quantitative classification based upon standard food security and self-reported recovery measures. The first was a community defined PD/resilience qualitative assessment. Key informants (KI) within communities identified community members who could sustain well-being or recovery quickly from the recent drought shock. They were further queried as to the characteristics of these households that made them resilient and the interventions (SomReP and other) that were most important for building resilience. KI and Focus Group Discussions (FGDs) around similar topics were held with community stakeholder groups and PDs of interest. These were:

- Community members (not identified as PDs) and not members of Savings Groups (VSLAs),
- Savings Group members not identified as PDs,
- Community members considered as PDs but not members of VSLAS, and
- Savings Group members considered to be PDs.

The qualitative instruments included core modules to be asked of all respondents and then conditional modules based on (1) the above respondent categories and (2) whether the tool was for a focus group or key informant setting. Figure 2 illustrates the design of the qualitative instruments (the full instruments can be found in Annex 2).

The qualitative inquiry was designed to capture the perspectives of different stakeholder groups about PD communities and households. Specifically, the semi-structured Key Informant Interviews (KII) and FGDs sought to explore in-depth the following questions:

- What does success in the coping with drought look like locally?
- What factors and strategies enable some community members and communities to achieve this success?
- Are there certain activities (implemented by SomReP or others) that support households and communities to be more successful?

Preliminary discussions among program staff hypothesized that Savings Groups (VSLAs) had notable effects on household and community resilience citing behaviors such as livelihood diversification, entrepreneurialism and collective action, including hosting and helping the neediest. For this reason, the qualitative component sought to gather more in-depth information around the role and value of VSLAs in coping with drought for both households and communities.

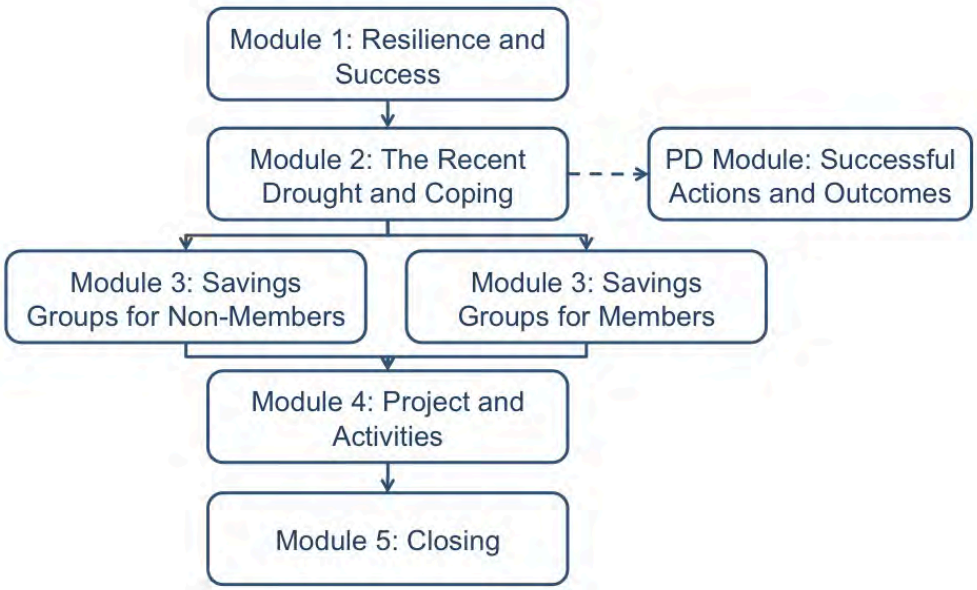


Figure 2: Qualitative Instrument Models (FGDs and KIIs)

Twenty-one villages were purposively selected for the qualitative component of the study (see Table 1). 43 FGDs, 27 KIs and 407 total study participants contributed to this component. Researchers used both structured and semi-structured interview guides. All interviews/discussions were recorded by a research assistant.

Training for the qualitative research team took place over three (3) days in Mogadishu prior to commencing fieldwork. In addition to their experience and skills, qualitative researchers were selected based on their geographical location and familiarity in order to account for local dialects and exposure to local context.[7] Aside from the researcher in Sanaag, who was responsible for communities in both Badhan and Erigavo, each researcher was assigned to one (1) district.

With the exception of two (2) districts, qualitative research took place over a span of five (5) days, from Sunday, the 20th through Thursday, the 24th of August 2017. In Eyl district, a logistical issue delayed the research team and thus, the field work took place beginning Monday, the 21st of August 2017[8]. In Luuq district, the research timeframe was extended through Saturday, the 26th of August 2017.

The probability household survey intended to capture quantitative outcomes related to food security and recovery, SomReP program exposures as well as characteristics of households. A subset of individuals identified by communities as PDs also was included in the household sample. This enabled quantitative comparison of community identified PDs as well as PDs defined by positive food security/ recovery outcomes. The household survey was administered via phone calls using CATI. The objective of the quantitative component was to profile PDs in comparison to their peers and more importantly to evaluate food security outcomes in relation to SomReP program exposures.

[7] With the exception of the researcher for Luuq district, all other researchers were based in the same region as the district for which they were responsible.

[8] The fieldwork still concluded on the 24th of August, as the team could carry out the research activities in each of the selected communities within the abbreviated timeframe.

Table 1: Communities selected for Participation in Qualitative Research

Region	District	Partner	Community
Gedo	Dollow	DRC	Kabasa IDP
			Una
			Wareyle
			Barabaray
	Luuq	REAL (World Vision)	Sheikh Maxaad
			Hilaac
			Jaziira IDP
			Garasow
			Garbolow
Nugaal	Eyl	ACF	Badey
			Biyocade
			Diliin
			Hasbahale
Sanaag	Badhan	CARE	Gumar
			Midigale
		STORRE (CARE)	Xingalool
	Erigavo	STORRE (CARE)	Carmale
Toghdeer	Odweyne	World Vision	Beerato
			Ceel-same
			Odweyne
			Gatiitaley

Table 2: Summary of Qualitative Research Participation

Region	District	FGDs	KIIs	Total Participants
Gedo	Dollow	7 FGDs	5 KIIs	77
	Luuq	10 FGDs	2 KIIs	91
Nugaal	Eyl	9 FGDs	7 KIIs	79
Toghdeer	Odweyne	9 FGDs	5 KIIs	83
Sanaag	Badhan	6 FGDs	6 KIIs	60
	Erigavo	2 FGDs	2 KIIs	17
Total		**43 FGDs**	**27 KIIs**	**407**

The quantitative household survey was developed based on SomReP's research hypotheses and objectives, with technical review and input from Forcier Consulting Limited[9] (partner that conducted the survey). The purpose of the household survey was to assess characteristics of households; their shock exposure and response within the last year; their exposure to selected project interventions, and selected food security and coping behaviors associated with improved resilience outcomes.

The survey instrument included modules covering:

- Respondent and household characteristics,
- Shock exposure and coping within the last year,
- Access to markets, information and services,
- Project exposure and participation, and
- Food security and coping indicators.

[9] Forcier Consulting Limited provides Third Party Monitoring Services for SomReP. https://www.forcierconsulting.com/services

Where possible, the survey instrument drew from standardized indicators (food security) or recently tested questionnaire items. The shock exposure and coping module is based on previous work by TANGO, and their project impact evaluation of the USAID-funded Pastoralist Areas Resilience Improvement and Market Expansion (PRIME) (Smith et al., 2015) in Ethiopia as well as USAID Somalia Resilience Baseline (Langworthy et al., 2016) with the specific approach abbreviated and adjusted to better suit the mode of data collection (phone calls). Further, the modules on established indicators such as the Food Consumption Score (FCS), the Reduced Coping Strategies Index (rCSI) and the Household Food Insecurity Access Scale (HFIAS) were based on standard methods (see Annex 4).

The respondent and household characteristics section used proxies for poverty measurement from the Simple Poverty Scorecard approach (Schreiner, 2011)[10] that identifies housing characteristics and assets highly correlated with poverty.

The sample design stratified villages per program intensity levels as reflected in the types and numbers of resilience intervention activities in villages that SomReP partners were working. Based on preliminary analysis of qualitative data and Implementing Partner (IP) assessments, the following activities were hypothesized to be potentially high-impact in terms of association with improved food security outcomes and reduced negative coping during times of drought:

- Trained and active community animal health workers (CAHWs),
- Savings groups/Village Savings and Loans Association (VSLAs),
- Rehabilitated or installed water assets (includes irrigation systems as well as water assets for household and livestock use), and
- Early Warning Early Action (EWEA) committees or Community-based Disaster Risk Management (CBDRM) systems.

Using these four (4) activities as a framework, the study team worked with partner agency staff to comprehensively identify the areas of activities implemented in all 82 communities that take part in relevant programming in the six (6) districts. The activities were organized per the SomReP unified log frame (see Annex 1).

The survey was fielded in 40 villages, just under half of the villages served by the SomReP project. The sample frame was stratified per program type (VSLA, water, animal health worker, early/drought warning interventions) and intensity (the number of interventions) as follows:

- No VSLA: The community does not have a VSLA, but may have any number of the other 'high-impact' activities
- Low 'high-impact': The community has a VSLA as well as one (1) additional 'high-impact' activity
- Medium 'high-impact': The community has a VSLA as well as two (2) additional 'high-impact' activities
- High 'high-impact': The community has a VSLA as well as all other three (3) 'high-impact' activities.

To achieve adequate sample sizes in different program exposure strata, the first stage of sampling involved the creation of these strata (i.e., the sample was not designed to be representative of project areas but rather to enable comparison of program type/intensity). In each selected village, field visits were made to collect cell phone numbers of residents and to ascertain the willingness of households to participate in a live operator conducted mobile phone interview. For each program stratum, a target number of households was calculated based on assumptions about interview completion rates and program coverage. While the target sample size for each stratum was originally 2808 interviews, for security and logistical reasons only 2175 households completed interviews (see Table 3). Completion rates are relatively high for a mobile phone survey (see Table 5) and the refusal rate was low.

The final sample reflects differences in IP strategies and by district (Table 4). Particularly notable is that Eyl and Odweyne had more high impact activities whereas Dollow and Badhan were the only districts in which part of the project area did not have a VSLA.

[10] Simple Poverty Scorecards use data from a country's national expenditure survey to identify a few simple, easily reported and verifiable indicators that can be used to estimate the probability that a household's expenditure is below a poverty line (scores are often calibrated to multiple poverty lines). Indicators often address areas such as household density, housing characteristics such as type of floor or number of rooms, and ownership of select assets. Each response in a scorecard is associated with a point score and the total score correlates with a poverty likelihood scale. The combined poverty likelihoods of a group can in turn be used to estimate poverty rates.

Table 3: Total Number of Samples, by Stratum

Stratum	Number of Communities	Number of Observations
No VSLA	5	470
Low	9	451
Medium	12	612
High	14	642
Total	**40**	**2175**

Table 4: Total Number of Samples, by Stratum and by District

Community Strata	N (communities)	N (households sampled in these communities)	Percent of households (District)					
			Badhan	Dollow	Erigavo	Eyl	Luuq	Odweyne
No VLSA	5	470	24%	76%				
LOW 'high-impact'	9	454		36%	10%		54%	
MEDIUM 'high-impact'	12	609	25%		5%	8%	14%	47%
HIGH 'high-impact'	14	642	2%	14%	7%	53%		25%
TOTAL	**40**	**2175**	**13%**	**28%**	**5%**	**18%**	**15%**	**21%**

Community Strata	Implementing partner/project, percent of households in the community strata						
	ACF	CARE	COOPI	DRC	STORRE (CARE)	WORLD VISION	REAL (WORLD VISION)
No VLSA		24%		76%			
LOW 'high-impact'				36%	10%		54%
MEDIUM 'high-impact'	8%	13%			17%	47%	14%
HIGH 'high-impact'	53%		11%	3%	9%	25%	
TOTAL	**18%**	**9%**	**3%**	**25%**	**9%**	**21%**	**15%**

Table 5: Number of Call Attempts, Refusals and Successful Attempts, by Stratum

Stratum	Number of phone numbers contacted	Number of refusals	Number of calls completed	Percent calls completed
No VSLA	950	5	470	49.47%
Low	1174	12	454	38.67%
Medium	1668	19	609	36.51%
High	1575	27	642	40.76%
Total	**5367**	**63**	**2175**	**40.52%**

The quantitative household survey was conducted by a live operator using the Open Data Kit (ODK) Collect application, a mobile phone-based survey tool that enters, edits and manages data.

Forcier Consulting Limited is the third-party monitor which carries out data collection, verification and evaluation for the SomReP. Forcier conducted the surveys from its call center in Hargeisa. This same call center was used for similar surveys, such as the Recurrent Monitoring System (RMS) survey conducted by TANGO International (TANGO International, 2018). The Forcier team trained enumerators on the 18th of September 2017. The training covered the topics of survey enumeration and data collection procedures, standard research ethics and data management. All survey questions were reviewed with the team to ensure correct translation and full enumerator comprehension. Challenging concepts, such as early warning/early action and recovery, were explained and discussed. 30 pilot surveys were conducted during the training and final questionnaire revisions were made. Household survey calls started on the 19th of September and continued through the 15th of October. A total of 20 enumerators conducted calls, each averaging five (5) to six (6) calls per day.

Enumerators used the same smartphone to simultaneously enter the data into ODK Collect and conduct the calls via microphone-enabled headphones. Enumerators were assigned regions and provided with SIM cards corresponding with the telecommunications provider in the area (Telesom for Somaliland, Golis for Puntland and Hormuud for South Central Somalia).

Each enumerator called numbers in one (1) village at a time and used the call sheet to track the outcome of each attempt[11]. Per Forcier's standard procedures, calls were attempted three (3) times over two (2) days before the number was considered unreachable. Calls lasted approximately 27.5 minutes on average.

[11] Outcome options included that the number was switched off, the number was wrong, the respondent declined to participate, the respondent asked to be called back at a different time, or the call/observation was completed.

The team leader was responsible for quality control functions prior to submitting the completed surveys to Ona[12], a web-based platform for data management and storage integrated with ODK. The project officer conducted daily monitoring and performed additional quality reviews, identifying discrepancies and providing feedback to the enumerators as needed. Quality controls included monitoring the length of the calls, checking closed responses for outliers, identifying any potentially abnormal responses, and cross-referencing observations within the same village.

The raw dataset exported from Ona in .csv format was converted into STATA database and Microsoft Excel files. All data cleaning was conducted using STATA. Following data collection, all open-ended responses were translated by two (2) experienced researchers. The translated text was inserted into the cleaned data set in STATA and later coded by a senior analyst.

Data Analysis

Qualitative Analysis

Two senior investigators from Forcier analyzed the qualitative data. Themes were first identified and then the transcripts were coded. Themes were analyzed by stakeholder group and were categorized as generally present in nearly all interviews/discussions; stakeholder specific; or specific to subgroups of study participants.

Quantitative Analysis

The quantitative analysis was carried out by analysts from Tulane University. Data were analyzed using SPSS, STATA and R. Both descriptive and analytical techniques were used to describe the study sample, its shock experience, coping strategies and well-being outcomes and then to test more specific hypotheses about the profile differences between PD and non-PD households; and the influence of program exposures on well-being outcomes.

Numerous multivariate analytical techiques were applied to this data set using mixed effects multiple regression analysis on different exposure perspectives (village level, household level) and multiple well-being outcomes (FCS, HHS, rCSI, self-perceived recovery[13]). The FCS, the most consistently related to most independent variables, was modeled both with FCS as a raw weighted score and as a binary outcome (food secure or not). Being food secure in the face of this severe drought shock is evidence of household resilience. Linear mixed models were fit for the FCS. Generalized mixed models fit by Maximum Likelihood Estimation was used to model the binary outcomes (food secure, not food secure). Random effects included the identity of the operator who conducted the survey (see Annex 6) as there was great variation in FCS and other outcomes across operators. Village indicators also were included as random effects due to the variation in sample sizes across villages. Other important variables included in the models (fixed effects) include SomReP intervention treatment types, income sources and diversity of sources, education of the senior female in the household, household headship, household wealth indicators (radio ownership, mattress/bed ownership, improved roof type). A social capital measure (regular communication with someone outside the village of the respondent), shock severity, coping strategies all were considered in various regression models.

Finally, Propensity Score Matching (PSM) was applied to the data set as another strategy for minimizing the influence of selection bias (only better off community members actually participating in the intervention). The team matched households that received three or more high impact interventions with those who had not reported participation in any SomReP Program. PSM takes advantage of computational capabilities to balance characteristics related to differential participation in program interventions among cases (treated) and controls.

Challenges and Limitations

The overarching limitations to this study are its *posteriori* nature, cross-sectional design and sample representativeness. The study was executed after SomReP programs had been operating in the districts for more than two years. No robust counterfactual to confidently estimate program impacts can be constructed. Cross-sectional designs have other important limitations, such as the inability to establish the temporal relationship between factors that might affect food security and food security. Therefore, the analysis cannot definitively establish causality through quantitative means. The modality of data collection, mobile phone surveys, has an inherent weakness in that the population sample frame of mobile phone users is not identical to that of the target population of interest. It is well known that mobile phone users in Somalia are richer, more urban and vary on other socio-economic and geographical characteristics (TANGO International, 2018). However, the purpose of this study is to estimate effect sizes and characteristics of resilient households as opposed to population prevalence estimates. Given the multivariate techniques used to account for socioeconomic correlates of resilience/PD and the use of PSM, selection bias is not believed to be a great threat to the validity of this study.

[12] Ona is a simple and powerful data platform built on Open Data Kit, an open-source set of mobile data collection tools. Ona helps organizations collect, share and make sense of data from the field. https://ona.io/home/

[13] HFIAP did not exhibit sufficient variability to include in the advanced analyses

Qualitative Component

Many of the challenges that were confronted in the qualitative fieldwork are attributable in part to the difficulty of operating in six (6) districts dispersed across a wide geographical spread, the complexity of coordinating with several SomReP partner organizations, and timing as well as logistical constraints.

Study preparation and qualitative fieldwork relied heavily on the support of SomReP partners in each district. Given the on-going crisis, implementing partners had limited time to coordinate field activities. Similarly, training for the qualitative assessment was conducted in Mogadishu rather than in a location that allowed access to the field. Therefore, the qualitative field tools could not be field tested.

Supervision of researchers during field implementation also was a challenge. Because of security issues, the study lead was unable to travel to field locations to provide support and oftentimes network coverage prevented daily check-ins once research teams were in the field. While local project staff stepped in to handle logistical issues, substantive backstopping was not always possible during the field work.

Quantitative Component

In early September, al-Shabaab attacked a military base and police station in Belet-Xawa District. Communities in Dollow and Luuq further away from urban centers experienced a heightened level of insecurity as a result and this prevented enumerators from reaching these communities as part of the phone number data base development. Therefore, the sample excluded important livelihood zones from these areas.

Developing a mobile phone data base also proved to be difficult. Enumerators collecting the phone numbers shared that in many locations respondents were reluctant to provide their phone numbers because al-Shabaab commonly solicits money from communities through threatening phone calls. As such, people were worried their phone numbers could be somehow spread to al-Shabaab militants and suggested that they rarely respond to phone calls from unrecognized numbers out of concern it could be al-Shabaab calling for such a purpose. In other communities, particularly in Dollow, Luuq and Odweyne, people believed the phone number collection was linked to SCOPE[14] registration or humanitarian cash transfer, raising expectations and possibly jeopardizing the idea of informed consent.

There were a number of threats to data quality; Annex 6 shows that operator bias was likely to have been present. From the mosaic plots, it is clear that food security scores varied dramatically across operators. Later in this report, challenges to accurately classifying households and villages as exposed to program interventions will be elaborated. Some questions had to be revisited by operators because response sets were not properly captured.

[14] SCOPE is WFP's beneficiary and transfer management platform that supports the WFP programme intervention cycle from beginning to end. The SCOPE platform is a web- based application used for beneficiary registrations, intervention setups, distribution planning, transfers and distribution reporting.

Section III:
Community Perceptions of Positive Deviants/Resilient Households and Communities

"Yes, the drought affected everyone because the drought name is "SIMA". It means it affects every community" – businessman identified as PD in Ergavo.

The qualitative inquiry exposed the widespread and severe impacts of this drought. Virtually all participants in the qualitative inquiry indicated the breadth and depth of drought together with its sequelae on lives and livelihoods.

However, it was widely recognized that some communities and households could absorb and adapt in the face of the drought shock. Positive Deviants and resilient communities/households were synonymous concepts by community members participating in this sample. PDs could withstand the shock while continuing to maintain their lives and livelihoods and, in some cases, even thrive. There was a good understanding in program areas of the nature of resilience as the ability to successfully prepare for and manage shocks such as droughts and floods. Participants saw proof of resilience as being able to maintain or rapidly restore livelihood assets required to achieve or sustain health and well-being.

Community characteristics associated with success were, in order of importance, livelihood profiles of the communities (risk diversified livelihoods) and preparedness/drought management organizations. Early Warning Information Committees/Drought Rescue or Management Committees were identified as key to preparedness and response by the majority of participants. Participants noted that where committees were well informed and active, communities were better able to absorb the effects of the drought.

Household PDs were viewed somewhat differently by different stakeholder groups, though all participants in the qualitative study cited assets and savings as essential to resilience/PD. They saw the proof of resilience as being able to maintain or rapidly restore livelihood assets required to achieve or sustain health and well-being. Diversified livelihoods, savings, access to water, markets and health services were all identified as important determinants of resilience. Those individuals identified as PD by other community members were seen as wealthier, better able to access loans and credit and to receive support from family members and the diaspora. They also were identified as agro-pastoralists. Many participants indicated that PDs were somewhat privileged in this respect.

Responses from those identified as PDs also echoed these findings; however, PDs also stressed important psychosocial determinants of success such as optimism; entrepreneurialism, not being discouraged by loss of assets, and strong community and familial social networks. As one PD from Wareyle, Dollow, noted: "**Resilient people are optimistic, informed and think proactively and are well prepared for crisis. They tend to have better strategy to deal with crisis and are not resistant to change**".

Having a culture of preparedness and savings also was noted by PDs as important to their success. They also more consistently identified the awareness of and ability to access NGO and humanitarian programs as an important capability that enabled them to successfully cope with the drought effects.

Coping behaviors associated with PDs included using savings to diversify incomes and smooth household consumption; moving animals to better pasturelands early; selling livestock early; having access to irrigation to improve agricultural interventions; the use of mixed cropping and drought resistant crops/livestock; temporary migration in search of work and accessing stored resources such as fodder and food.

Several themes emerged around the role of interventions to strengthen resilience. Key themes were the importance of crisis modifiers or layering of safety net programs over resilience building investments; the need for multiple interventions to strengthen resilience (meeting basic needs); and the importance of attitudinal and social determinants of resilience were the most prominent. Study participants prioritized SomReP interventions somewhat differently per their livelihood sources and available assets.

Study participants expressed the urgency of interventions that provided key human needs that were threatened by the drought. Access to water and to sources of cash/food was a universal concern. Whether a pastoralist or agro-pastoralist, water for human consumption, livestock use (those with animals) and irrigation (those engaged in crop production) were cited as important. The majority of interviews/ discussions highlighted the need for humanitarian assistance.

Almost all participants in the qualitative study signaled the need for multiple interventions to successfully build resilience in the face of large covariate shocks. Though greatly appreciative of SomReP programs, many participants in Savings Groups cited the desirability of pairing SGs with Cash for Work (CFW) to enable SG members to save more effectively. Numerous examples were given during interviews and FGDs of the need for more layering of interventions and of the need for humanitarian assistance to protect the gains achieved by resilience programs. Some participants were particularly vocal about the substitution of resilience programs for humanitarian assistance. They did not feel that resilience projects without humanitarian aid could prevent them from recidivism and some noted that humanitarian aid was not sufficient or timely. Examples were given, however, of the value of linking multiple interventions at the household level as illustrated by one PD in Badhan:

"**The most important action to respond to drought is saving money and grass and maize for my livestock, and I constructed large berkad under the support of CARE. (As a result,) 80% of my livestock are saved and I had water (sic)**".

This also was illustrated by the results of a FGD in an IDP community in Dollow that noted that SG members were well informed of project activities and participated in many activities that are implemented in their area: saving groups, cash for work and vocational skills training.

Given the initial hypothesis of this study around the potential significance of VSLAs for building resilience, the qualitative inquiry specifically probed study participants about the utility and impacts of savings groups for resilience. In most cases, except for participants in Dollow, SGs were viewed as high impact interventions that allowed members to finance livelihood diversification and drought mitigation measures (many specific examples were given by community members and SG members). However, many SG members and some community members (in Dollow) noted that the VSLAs were not sufficient, in the face of this large co-variate shock, to cope with its effects. In Dollow, some SGs were disbanded because people no longer had the ability to save. Many SG participants stressed that CFW and cash grants were needed for them to successfully mitigate the drought's effects.

The qualitative study exposed multiple pathways through which VSLAs built resilience. Numerous examples were given about how loans from the program enabled households to strengthen the diversify income sources. These included starting or enhancing small business activities; planting crops for human and animal consumption; migrating in search of better pasture and selling water. In some cases, these activities even took advantage of the drought situation to bootstrap a new business that complemented humanitarian assistance efforts:

"**During the recent drought there were shortages of vegetables in the village. I borrowed a loan from the Savings Group and started a small grocery business selling mostly vegetables and other foodstuff**", PD from Dollow.

A 38-year-old business woman in Odweyne explained: "**The prolonged drought has been around 2 years. The drought was severe when the 2 seasonal rains failed. It affected all members in the Ceelsame community and I'm one them. I had 85 goats and sheep before the drought, and I lost 40 of 85 due to the lack of water and diseases caused by starvation. I was challenged some time due to my strategy to prepare for the drought by selling some animals to save money for drought or buy fodder plants to save and use later when the drought became serious. Unfortunately, I had a plan to sell some of my animals at a good price to cover basic needs for my family during the drought, but this did not happen because they lost their value and started to die rapidly due to disease and starvation.**

As I'm a member of a Savings Group, I had savings during the drought. I had lost half of my livestock animals, so I thought about other strategies to sustain my family. I decided to start a small shop in a strategic place and rent a place in the middle of the village. Then I took a loan from my group and a shop in the village now covers all basic needs of my family and is a good replacement for losing my animals. This action has allowed me to cope during and after the drought."

A PD from Dollow noted, "**I was able to borrow a loan from the Saving Groups and repair a water pump which I used to irrigate my farm**."

The VSLA activity also was felt to be a successful capacity development activity, particularly for women: "**we may have little formal education but have taken part in capacity building workshops as members of VSLA groups**". The capacity building nature of the VSLA activity surfaced in more than half of the discussions focused on SGs.

Universally, SG participants felt that SGs built social capital, self-esteem and empowered them. SGs provided a mechanism for self-help to exchange ideas, expertise and other resources. For some, it was a place where they could relieve stress through group interactions. Most participants took pride in their ability, through the social fund component of the VSLA, to help the neediest in the community. This elevated self-esteem and status in the community, including their newly acquired credit-worthiness. One SG FGD in Odweyne in Odweyne stated that they would advise others to join VSLAs rather than relying on the clan during times of need, because unlike clans, "**VSLA's share profit and opportunity**".

BONDING, BRIDGING AND LINKING SOCIAL CAPITAL

Bonding social capital – ties between individuals with a relatively high degree of network closure. Bonding social capital is often described as horizontal ties between individuals within the same social group (as opposed to vertical ties between social groups). Bonding social capital is often associated with local communities where many people know many other people in the group (network closure). Bonding social capital is often associated with strong norms, mores and trust which can have both positive and negative manifestations and implications for social exclusion. Many members have access to similar network assets so while providing solidarity, bonding social capital may not provide useful network assets in some situations.

Bridging social capital – ties between individuals which cross social divides or between social groups. From a network perspective bridging social capital places the actors at structural holes where each is able to tap into the social network resources of each other's social group. This is also described as vertical ties often operating through formal hierarchical structures. Bridging social capital may not involve many shared norms but is likely to be associated with reciprocity and 'thin trust'. It may provide access to network resources outside of an individual's normal circles and as such can provide significant individual (and group) benefits.

Linking social capital – 'norms of respect and networks of trusting relationships between people who are interacting across explicit, formal, or institutionalized power or authority gradients in society'. These relationships are described as 'vertical' and the key feature is differences in social position or power. An example could be relationships between a community-based organisation and government or other funders.

The importance of the development of social capital as a cross-cutting theme emerged from most of the interviews and discussions. Bonding, bridging and linking social capital were all important. Bonding social capital was mentioned most often with regard to family/kinship networks as a source of support during crisis. It was also mentioned as an important outcome of SGs. Development of bridges within and between villages to assist the destitute members of communities was viewed to be very important to successful coping. Drought Rescue Committees were repeatedly mentioned as important to recovery. They conferred credibility to local government, resulting in improved linking social capital.

An important finding from the qualitative study was that interpreting coping behavior measures can be complex. Migration can be a positive or negative coping strategy. Early migration in search of better pastures was viewed as a positive coping strategy and sign of resilience. Distress migration to access humanitarian assistance signaled destitution/vulnerability. Similarly, early livestock sales was a positive coping strategy while late sales was a signal of distress.

Section IV:
Positive Deviants' Perceptions in Comparison with Household Survey Characteristics, Drought Severity, Coping Strategies and Program Exposures

Of the 2,175 households in the survey, 105 included a PD respondent. This part of the analysis compared PD respondents with respondents from non-PD households. The sample was restricted to households living in communities where PDs were identified. In the communities where the 105 PDs were identified, there were 1,017 households not identified as PD households.

Differences in Household Demographics, Education, Assets and Livelihoods

Positive deviant households generally were better off socio-demographically than those who were not positive deviants, though the differences between the two varied across the different characteristics measured, as did statistical significance. The percentage of female-headed households (FHH) was equivalent among PDs and not-PDs; while the percentage of households having women with some education was significantly higher among PD households, but varied by only 7% points.

Table 6: Positive Deviant Households – Effect of Female Education

		Positive Deviant- HH classified as positive deviant by researchers	
		NOT a pos. dev (but lives in community that was evaluated for positive deviants)	Positive Deviant HH
		(A)	(B)
		Column N %	Column N %
Female headed households	Female	23.8%	23.8%
	Male	54.0%	52.4%
	Unknown	22.2%	23.8%
Highest level of education of the female head/spouse	No education	64.9%	58.1%
	Primary incomplete	16.0%	21.9%
	Primary complete or more	10.0%	13.3%
	Other education (literacy, church/mosque)	5.4%	5.7%
	No female head/spouse, or don't know	3.6%	1.0%

Results are based on two-sided tests. For each significant pair, the key of the category with the smaller column proportion appears in the category with the larger column proportion.
Significance level for upper case letters (A, B, C): .05[1]

1. Tests are adjusted for all pairwise comparisons within a row of each innermost sub table using the Bonferroni correction.

Similarly, PD households were somewhat larger than non-PD households. The percentage of households with improved roof materials was more than 11% higher among PDs and the percentage owning mattresses/beds was 16% points higher. Improved hygiene was in the right direction (a higher percentage of PDs had it) but not statistically significant.

Table 7: Positive Deviant Households - Effect of Number of People in Household

	Positive Deviant- HH classified as positive deviant by researchers	
	NOT a pos. dev (but lives in community that was evaluated for positive deviants)	Positive Deviant HH
	(A)	(B)
	Mean	Mean
Crowding (number of people/ number of rooms+1)	3.73	3.63
Dependency ratio (number children under 17/number of adults)	1.60	1.70
9a. How many people live in the household?	8.4	9.0 A
9b. How many people under 17 years of age live in the household?	4.4	4.8

Results are based on two-sided tests assuming equal variances. For each significant pair, the key of the smaller category appears in the category with the larger mean.
Significance level for upper case letters (A, B, C): .05[1]

1. Tests are adjusted for all pairwise comparisons within a row of each innermost sub-table using the Bonferroni correction.

Table 8: Positive Deviant Households - Effect of Household Assets; Type and Ownership

		Positive Deviant- HH classified as positive deviant by researchers	
		NOT a pos. dev (but lives in community that was evaluated for positive deviants)	Positive Deviant HH
		(A)	(B)
		Column N %	Column N %
Roof Bivariate (iron, cement, wood/mud)	Other kind of roof (thatched, plastic, cloth, no roof, other)	54.7% B	43.8%
	Iron, Cement, and/or wood/mud roof	45.3%	56.2% A
Latrine type bivariate	Poor hygiene (no toilet, shared flush, shared slab pit, no-slab pit	69.1%	60.0%
	Improved hygiene (private flush, private slab pit, blair latrine)	30.9%	40.0%
Radio bivariate	Don't own	85.7%	81.0%
	Own	14.3%	19.0%
Bed/mattress bivariate	Don't own	76.0% B	60.0%
	Own	24.0%	40.0% A

Results are based on two-sided tests. For each significant pair, the key of the category with the smaller column proportion appears in the category with the larger column proportion.
Significance level for upper case letters (A, B, C): .05[1]

1. Tests are adjusted for all pairwise comparisons within a row of each innermost sub table using the Bonferroni correction

Section V: Food Security/Well-being/Recovery Outcomes

Food security status was somewhat better among PDs than non-PDs though the magnitude of differences varied by indicator. The largest differences in food security measures between the two groups were found in the HHS, the FCS (mean scores), and the HFIAP. All showed significant differences between categories of hunger (in the case of HHS and HFIAP). The HHS showed a nearly 20 % points difference between the percentage of PDs and non-PDs who experienced little or no hunger and it also showed that non-PDs were more likely to experience moderate and severe hunger. In the case of the HFIAP, PDs were more likely to experience mild and moderate food insecurity, while non-PDs were more likely to experience severe food insecurity. PDs had more than a 5 point higher FCS (41.2 versus 36.56).

Thus, the indicator that appeared to be discriminate between PDs and non-PDs in this study sample was the HHS, an experiential score.

Table 9: Positive Deviant Households - Food Security Status (all indicators)

		Positive Deviant- HH classified as positive deviant by researchers	
		NOT a pos. dev (but lives in community that was evaluated for positive deviants)	Positive Deviant HH
		(A)	(B)
		Column N %	Column N %
Food Consumption Groups	Poor Food Consumption	43.1%	36.2%
	Borderline Food Consumption	20.9%	23.8%
	Acceptable Food Consumption	36.0%	40.0%
HHS Categories	Little to no hunger in household	42.6%	61.5% A
	Moderate hunger in household	43.0% B	32.7%
	Severe hunger in household	14.4% B	5.8%
HFIAP (household food insecurity access scale groups)	Food Secure	11.1%	6.7%
	Mildly Food Insecure Access	5.9%	11.5% A
	Moderately Food Insecure Access	8.6%	16.3% A
	Severely Food Insecure Access	74.5% B	65.4%
rCSI categories	No or low coping (rCSI < 4)	13.4%	13.3%
	Moderate coping (rCSI 4-9)	8.3%	6.7%
	High coping (rCSI 10 and higher)	78.4%	80.0%
Recovery from drought-extent the HH was able to recover from recent drought impacts	Did not recover	65.8%	67.3%
	Recovered some, but worse off than before event	26.1%	23.1%
	Recovered to same level as before event	7.3%	7.7%
	Recovered and better off than before event	0.8%	1.9%

Results are based on two-sided tests. For each significant pair, the key of the category with the smaller column proportion appears in the category with the larger column proportion.
Significance level for upper case letters (A, B, C): .05[1]

1. Tests are adjusted for all pairwise comparisons within a row of each innermost sub table using the Bonferroni correction.

Table 10: Positive Deviant Households - Food Security Status (Food Consumption Score)

	Positive Deviant- HH classified as positive deviant by researchers	
	NOT a pos. dev (but lives in community that was evaluated for positive deviants)	Positive Deviant HH
	(A)	(B)
	Mean	Mean
Food Consumption Score	36.56	41.20 A

Results are based on two-sided tests assuming equal variances. For each significant pair, the key of the smaller category appears in the category with the larger mean
Significance level for upper case letters (A, B, C): .05[1]

1. Tests are adjusted for all pairwise comparisons within a row of each innermost sub table using the Bonferroni correction.

Section VI: Shocks and Coping

There were no significant differences in reported shock exposure between PD and non-PD households. The number of shocks experienced by the household and PD status also did not show a clear relationship.

PDs felt that the drought was the worst that they have experienced. The difference between PDs and non-PDs was 10% points.

On the other hand, certain coping strategies were more commonly employed by PDs than non-PDs. These include:

- selling livestock (12% points more)
- slaughtering livestock (15% points more)
- taking children out of school (12% points more)

It should be noted, however, that non-PDs did not employ any specific coping strategies more frequently than PDs.

Table 11: Positive Deviant Households - Reported Shock Exposure (type of shock)

Percent of households that report experiencing the shock in the previous 12 months.	Positive Deviant- HH classified as positive deviant by researchers	
	NOT a pos. dev (but lives in community that was evaluated for positive deviants)	Positive Deviant HH
	(A)	(B)
	Column N %	Column N %
Drought	97%	100%
NO shock (other than drought)	16%	22%
Conflict / violence	4%	2%
Crop disease and/or pest	11%	14%
Flood	2%	3%
Food price increase	52%	50%
Livestock disease or epidemic	32%	29%
Human disease or epidemic	28%	36%
Displacement of people from or into your community	27%	21%
Illness of a household member	22%	18%
Death of a wage earner	3%	3%
Death or illness of someone outside the household	5%	8%
Sudden loss of outside income	1%	0%
Unexpected expense	4%	5%
Sudden loss of aid	2%	2%
Loss of livestock due to theft	9%	13%
Loss of livestock due to death	37%	45%
Other (specify)	2%	3%

Results are based on two-sided tests. For each significant pair, the key of the category with the smaller column proportion appears in the category with the larger column proportion.
Significance level for upper case letters (A, B, C): .05[b]

a. This category is not used in comparisons because its column proportion is equal to zero or one.

b. Tests are adjusted for all pairwise comparisons within a row of each innermost sub table using the Bonferroni correction.

Table 12: Positive Deviant Households - Reported Shock Exposure (number of incidences in past year)

Total Number of shocks in the past year (categories)	Positive Deviant- HH classified as positive deviant by researchers	
	NOT a pos. dev (but lives in community that was evaluated for positive deviants)	Positive Deviant HH
	(A)	(B)
	Column N %	Column N %
none or one shock	16.5%	22.9%
2.00	18.8%	14.3%
3.00	23.1% B	14.3%
4.00	17.5%	21.0%
5.00	12.1%	10.5%
6.00	6.0%	9.5%
7 or more shocks	6.0%	7.6%

Results are based on two-sided tests. For each significant pair, the key of the category with the smaller column proportion appears in the category with the larger column proportion.
Significance level for upper case letters (A, B, C): .05[1]

1. Tests are adjusted for all pairwise comparisons within a row of each innermost sub table using the Bonferroni correction.

Table 13: Positive Deviant Households - Effect of Shock Exposure on Income and Food Consumption

		Positive Deviant- HH classified as positive deviant by researchers	
		NOT a pos. dev (but lives in community that was evaluated for positive deviants)	Positive Deviant HH
		(A)	(B)
		Column N %	Column N %
22b. How severe was the impact on your income and food consumption?	No impact (none)	0.6%	0.0%[1]
	Slight impact	1.5%	0.0%[1]
	Moderate impact	7.5%	2.9%
	Strong impact	58.3%	54.8%
	Worst ever happened	32.1%	42.3% A

Results are based on two-sided tests. For each significant pair, the key of the category with the smaller column proportion appears in the category with the larger column proportion.
Significance level for upper case letters (A, B, C): .05[2]

1. This category is not used in comparisons because its column proportion is equal to zero or one.

2. Tests are adjusted for all pairwise comparisons within a row of each innermost sub table using the Bonferroni correction.

Note: All of the 105 PD households reported having experienced drought and have data for this follow-up question. 3% (27 households) of the non-PD households reported not having experienced drought, and were not asked this question, and so excluded from the analysis

Table 14: Positive Deviant Households - Coping Strategy Response to Shock Exposure

	Positive Deviant- HH classified as positive deviant by researchers	
	NOT a pos. dev (but lives in community that was evaluated for positive deviants)	Positive Deviant HH
	(A)	(B)
	Column N %	Column N %
Send livestock in search of pasture?	39.2%	42.9%
Sell livestock?	20.8%	32.4% A
Slaughter livestock?	15.5%	30.5% A
Lease out land?	0.8%	1.0%
Temporarily migrate?	23.4%	21.0%
Permanently migrate?	11.7%	6.7%
Send children or an adult to stay with relatives?	5.9%	5.7%
Take children out of school?	20.2%	32.4% A
Reduce food consumption?	41.0%	45.7%
Take up new wage labor?	0.8%	1.0%
Engage in charcoal production?	0.2%	1.9% A
Engage in firewood sales?	2.4%	2.9%
Sell household items (e.g. radio, bed)?	0.4%	0.0%[1]
Sell any assets that you or your household used to earn an income/ provide for household needs?	2.1%	2.9%
Take a loan from Savings Group/ VSLA?	2.8%	4.8%
Take a loan from another source?	19.5%	20.0%
Receive money or food from family members within the community?	3.1%	3.8%
Receive food aid or assistance from the government (including food/ cash for work?	3.1%	6.7%
Receive food aid or assistance from an NGO (including food/cash for work)?	18.2%	21.9%
Use money from savings?	2.9%	0.0%[1]
Get money from a relative from outside the village but inside Somalia/ Somaliland?	1.4%	1.9%
Get money from a relative in another country/abroad (remittances)?	1.6%	3.8%
Receive help from local organizations/companies?	2.3%	2.9%

Results are based on two-sided tests. For each significant pair, the key of the category with the smaller column proportion appears in the category with the larger column proportion.
Significance level for upper case letters (A, B, C): .05[2]

1. This category is not used in comparisons because its column proportion is equal to zero or one.

2. Tests are adjusted for all pairwise comparisons within a row of each innermost sub table using the Bonferroni correction.

Section VII: Well-being Outcomes and Correlates

This section of the report explores the relationships among various background and socio-economic characteristics, shock experience, coping and food security/recovery outcomes. We explore relationships with the following well-being outcomes that are frequently associated with resilience:

- Food Consumption Score: this reflects the weighted average of the frequency of consumption (during the week before the interview) of basic food groups, coded to consumption adequacy groups
- Household Hunger Score: the frequency of experiencing hunger, coded to severity of hunger categories
- Household Food Insecurity Access Scale Groups (HFIAP)
- Reduced Coping Strategies Index (rCSI)
- Perceived Recovery

These are correlated measures that capture different aspects of food security/insecurity and perceptions of resilience (Maxwell et al., 2013). Data on these indicators from this study suggest that the perception indicators of food security (HHS and rCSI) correlate more highly than either of these correlate with the FCS (see Annex 4). We report associations with all five indicators in the tables below. However, we do not discuss the HFIAP as it does not add value to information from the other four indices.

Well-being Outcomes by Basic Household Characteristics

In this sample, food security status varied substantially among the six districts. In general, the four food security indicators and the self-reported recovery indicator behaved similarly with some differences. Food security as defined by the FCS was highest in Erigavo and Badhan and lowest in Badhan and Dollow. Lack of hunger (HHS) also was highest in Erigavo and Badhan, but severe hunger (HHS) was highest in Dollow and Luuq. The recovery indicator showed a somewhat different pattern where Erigavo reported the highest levels of recovery while Dollow, Eyl and Luuq reported the lowest levels of recovery.

The agro-pastoral livelihood zone showed consistently better outcomes than other livelihood zones while IDP communities had the poorest outcomes. While the peri-urban sample had higher food consumption levels than the pastoral or IDP communities, the peri-urban sample was not superior to pastoral or IDP communities on the other well-being measures.

Female-headed households faired worse on all indicators. These **differences were significant in the case of food consumption, household hunger and the coping strategies index**. However, those households in which the **head was unknown**, most commonly due to an extended family structure, **performed better than male headed households on the food consumption and coping strategies index**. They also had less severe hunger than either female- or male-headed households. There were no discernable patterns for household recovery.

Education of the senior female (head or spouse of head) was consistently associated with somewhat **improved food security and recovery indicators**, except for the coping strategies index.

The data on household livelihoods further suggests the importance of source of income on well-being outcomes. Food consumption was most frequently adequate among those relying on aid as their primary income source, followed by salaried workers and agro-pastoralists. Poor food consumption was highest among those who reported no income source or unpaid work or who didn't respond to the survey, followed by those who reported handicrafts as their primary source of income, and those relying on pastoralism and wage labour respectively. The HHS showed a similar pattern, except that only other and wage labor were associated strongly with severe hunger. Use of negative coping strategies was least by those relying on remittances and most by pastoralists.

The number of livelihood sources was strongly related to the FCS and moderately to self-reported recovery but not to perceived hunger or coping. This result is of note and requires further exploration.

Table 15: Well-being Outcomes by District

		District					
		Badhan	Dollow	Erigavo	Eyl	Luuq	Odweyne
		(A)	(B)	(C)	(D)	(E)	(F)
		Column N %	Column N %	Column N %	Column N %	Column N %	Column N %
Food Consumption Groups	Poor Food Consumption	58.2% C E F	59.3% C E F	33.1%	50.6% C F	43.7% F	32.7%
	Borderline Food Consumption	18.6%	20.5%	19.5%	23.1%	21.1%	17.4%
	Acceptable Food Consumption	23.2%	20.2%	47.5% A B D	26.2%	35.2% A B	49.9% A B D E
HHS Categories	Little to no hunger in household	35.6% B	17.2%	69.0% A B D E	33.1% B	27.7% B	63.9% A B D E
	Moderate hunger in household	51.4% C F	47.5% C F	29.2%	50.6% C F	50.2% C F	30.6%
	Severe hunger in household	12.9% C F	35.3% A C D E F	1.8%	16.3% C F	22.2% A C F	5.5%
HFIAP (household food insecurity access scale groups)	Food Secure	8.3%	5.3%	17.2% B E	8.3% E	3.0%	13.5% B E
	Mildly Food Insecure Access	5.1% B	0.7%	10.3% B E	3.6% B	2.4%	14.9% A B D E
	Moderately Food Insecure Access	9.4% B	2.8%	10.3% B	9.6% B	8.8% B	10.6% B
	Severely Food Insecure Access	77.3% C F	91.2% A C D F	62.1%	78.6% C F	85.8% C F	61.0%
rCSI categories	No or low coping (rCSI < 4)	9.6%	5.6%	25.4% A B D E	9.8%	5.7%	19.5% A B D E
	Moderate coping (rCSI 4-9)	5.7%	4.8%	20.3% A B D E	6.9%	3.9%	14.3% A B D E
	High coping (rCSI 10 and higher)	84.6% C F	89.7% C F	54.2%	83.3% C F	90.4% C F	66.2%
Recovery from drought-extent the HH was able to recover from recent drought impacts	Did not recover	58.3% C	79.0% A C F	26.3%	74.2% A C F	74.4% A C F	57.4% C
	Recovered some, but worse off than before event	31.0% B D	16.5%	50.8% A B D E F	18.4%	21.0%	32.6% B D E
	Recovered to same level as before event	9.2% B	4.0%	21.2% A B D E F	6.1%	3.7%	9.6% B E
	Recovered and better off than before event	1.5%	0.5%	1.7%	1.3%	0.9%	0.5%

Results are based on two-sided tests. For each significant pair, the key of the category with the smaller column proportion appears in the category with the larger column proportion.
Significance level for upper case letters (A, B, C): .05[2]

1. This category is not used in comparisons because its column proportion is equal to zero or one.

2. Tests are adjusted for all pairwise comparisons within a row of each innermost sub table using the Bonferroni correction.

Table 16: Well-being Outcomes by Livelihood Zone

		Livelihood Zone			
		Agro-pastoral	Pastoral	Peri-urban	IDP community
		(A)	(B)	(C)	(D)
		Column N %	Column N %	Column N %	Column N %
Food Consumption Groups	Poor Food Consumption	35.5%	57.8% A C	45.5% A	61.3% A C
	Borderline Food Consumption	20.9%	19.9%	19.7%	19.3%
	Acceptable Food Consumption	43.6% B D	22.3%	34.8% B D	19.3%
HHS Categories	Little to no hunger in household	53.8% B C D	35.0% D	28.5% D	11.7%
	Moderate hunger in household	38.2%	49.2% A	49.2% A	48.2% A
	Severe hunger in household	7.9%	15.8% A	22.3% A	40.1% A B C
HFIAP (household food insecurity access scale groups)	No or low coping (rCSI < 4)	16.2% B C D	9.5% D	6.6%	5.1%
	Moderate coping (rCSI 4-9)	11.7% C D	7.8% D	3.7%	3.7%
	High coping (rCSI 10 and higher)	72.1%	82.7% A	89.8% A	91.2% A B
	Food Secure	11.6% C D	8.3%	3.7%	4.5%
rCSI categories	Mildly Food Insecure Access	10.1% B C D	4.2% D	2.9% D	0.2%
	Moderately Food Insecure Access	10.6% D	9.2% D	8.6% D	1.2%
	Severely Food Insecure Access	67.7%	78.3% A	84.8% A	94.1% A B C
Recovery from drought- extent the HH was able to recover from recent drought impacts	Did not recover	56.8%	72.7% A	73.5% A	76.9% A
	Recovered some, but worse off than before event	31.4% B C D	20.3%	20.2%	19.7%
	Recovered to same level as before event	10.7% B D	5.8%	5.0%	3.4%
	Recovered and better off than before event	1.1%	1.3%	1.3%	0.0%1

Results are based on two-sided tests. For each significant pair, the key of the category with the smaller column proportion appears in the category with the larger column proportion.
Significance level for upper case letters (A, B, C): .05[2]

1. This category is not used in comparisons because its column proportion is equal to zero or one.

2. Tests are adjusted for all pairwise comparisons within a row of each innermost sub table using the Bonferroni correction.

Table 17: Well-being Outcomes by Education of Females

		Female headed households			Female head/spouse education (none or church/ koranic vs. all other levels).	
		Female	Male	Unknown	No education, literacy, or church/ mosque	Incomplete primary and higher
		(A)	(B)	(C)	(A)	(B)
		Column N %	Column N %	Column N %	Column N %	Column N %
Food Consumption Groups	Poor Food Consumption	55.5%B C	47.7%C	40.7%	50.5%B	42.8%
	Borderline Food Consumption	19.2%	21.2%	18.1%	19.7%	21.4%
	Acceptable Food Consumption	25.3%	31.1%A	41.2%A B	29.8%	35.8%A
HHS Categories	Little to no hunger in household	30.7%	37.3%A	40.7%A	35.1%	38.2%
	Moderate hunger in household	44.5%	43.8%	46.9%	44.4%	46.1%
	Severe hunger in household	24.9%B C	18.8%C	12.4%	20.5%B	15.7%
HFIAP (household food insecurity access scale groups)	Food Secure	7.0%	7.8%	11.0%	7.9%	8.4%
	Mildly Food Insecure Access	4.8%	5.6%	5.8%	5.6%	5.0%
	Moderately Food Insecure Access	5.6%	9.2%A	6.5%	7.2%	9.4%
	Severely Food Insecure Access	82.6%B	77.4%	76.8%	79.2%	77.2%
rCSI categories	No or low coping (rCSI < 4)	10.6%	9.8%	14.0%	10.2%	11.5%
	Moderate coping (rCSI 4-9)	7.3%	6.7%	12.5%A B	7.5%	9.0%
	High coping (rCSI 10 and higher)	82.1%C	83.5%C	73.5%	82.4%	79.5%
Recovery from drought-extent the HH was able to recover from recent drought impacts	Did not recover	64.7%	68.8%	67.0%	68.9%	64.5%
	Recovered some, but worse off than before event	26.8%	23.8%	24.0%	24.2%	24.8%
	Recovered to same level as before event	7.3%	6.7%	8.0%	6.2%	9.5%A
	Recovered and better off than before event	1.1%	0.8%	1.0%	0.7%	1.3%

Results are based on two-sided tests. For each significant pair, the key of the category with the smaller column proportion appears in the category with the larger column proportion.
Significance level for upper case letters (A, B, C): .05[1]

1. Tests are adjusted for all pairwise comparisons within a row of each innermost sub table using the Bonferroni correction.

Table 18: Well-being Outcomes by Source of Income

Livelihood (income source) groups		Farm/ crop production and sales MAIN (NO livestock as secondary)	Farm/crop production and sales MAIN, Livestock as SECONDARY	Livestock production and sales MAIN (NO agriculture as secondary)	Livestock production sales MAIN, Agriculture as SECONDARY	Wage Labor (agriculture or other), and Salaried Agriculture work
		(A)	(B)	(C)	(D)	(E)
		Column N %	Column N %	Column N %	Column N %	Column N %
Food Consumption Groups	Poor Food Consumption	44.6%	35.1%	51.8% B F	44.8%	52.6% F
	Borderline Food Consumption	24.7%	20.6%	22.2%	21.6%	20.5%
	Acceptable Food Consumption	30.6%	44.3% C H K	26.1%	33.6%	26.9%
HHS Categories	Little to no hunger in household	45.3% E K	33.1%	34.5%	38.1%	21.1%
	Moderate hunger in household	44.2%	45.4%	48.8%	41.8%	46.1%
	Severe hunger in household	10.6%	21.5%	16.7%	20.1%	32.9% A C F J
HFIAP (household food insecurity access scale groups)	Food Secure	7.2%	10.1%	5.4%	9.8%	5.2%
	Mildly Food Insecure Access	5.7%	3.9%	5.1%	3.8%	3.9%
	Moderately Food Insecure Access	10.6%	4.7%	8.0%	3.8%	2.6%
	Severely Food Insecure Access	76.4%	81.4%	81.5%	82.7%	88.3%
rCSI categories	No or low coping (rCSI < 4)	12.2%	12.2%	7.1%	10.4%	6.4%
	Moderate coping (rCSI 4-9)	10.7%	10.7%	6.6%	3.7%	7.7%
	High coping (rCSI 10 and higher)	77.1%	77.1%	86.3% A I J	85.8%	85.9%
Recovery from drought-extent the HH was able to recover from recent drought impacts	Did not recover	73.1% B F	55.7%	73.5% B F H	66.2%	72.4%
	Recovered some, but worse off than before event	22.0%	35.9% C K	16.8%	24.8%	21.1%
	Recovered to same level as before event	3.8%	7.6%	8.7%	8.3%	6.6%
	Recovered and better off than before event	1.1%	0.8%	1.0%	0.8%	0.0%1

Results are based on two-sided tests. For each significant pair, the key of the category with the smaller column proportion appears in the category with the larger column proportion. Significance level for upper case letters (A, B, C): .05[2]

1. This category is not used in comparisons because its column proportion is equal to zero or one.

2. Tests are adjusted for all pairwise comparisons within a row of each innermost sub table using the Bonferroni correction.

Salaried work (non-agricultural) and other self employed/own business	Fishing and Sale of wild/ bush products (e.g., honey, charcoal)	Handicrafts	Remittances	Other- Aid Organization	OTHER (domestic, other, don't know, no response)
(F)	(G)	(H)	(I)	(J)	(K)
Column N %	Column N %	Column N %	Column N %	Column N %	Column N %
28.6%	52.5%	54.3% B F J	51.2%	35.3%	65.0% A B F J
22.1%	10.2%	19.1%	7.3%	12.6%	15.5%
49.3% A C H K	37.3%	26.6%	41.5%	52.1% A C E H K	19.4%
43.3% K	28.1%	35.5%	40.0%	46.6% E K	22.3%
43.3%	45.6%	42.9%	32.5%	43.2%	38.8%
13.4%	26.3%	21.6% A	27.5%	10.2%	38.8% A C F H J
11.0%	3.4%	10.2%	15.4%	14.4% C	3.9%
6.6%	10.3%	5.6%	7.7%	6.8%	4.9%
11.0%	1.7%	9.0%	2.6%	10.2%	4.9%
71.3%	84.5%	75.3%	74.4%	68.6%	86.4%
17.9%C	3.4%	11.6%	26.8% C G	17.6% C	6.8%
7.1%	5.1%	9.3%	7.3%	8.4%	6.8%
75.0%	91.5%	79.1%	65.9%	73.9%	86.4%
52.3%	63.8%	62.4%	64.9%	61.4%	84.2% B F H J
34.4% C K	25.9%	29.8%C	32.4%	32.5%C	13.9%
12.5%	10.3%	7.0%	2.7%	3.5%	2.0%
0.8%	0.0%1	0.8%	0.0%[1]	2.6%	0.0%1

Table 19: Well-being Outcomes by Number of Sources of Income

		Total number of income sources in the household		
		One main income source	Two income sources (one main, plus one secondary)	3 or 4 income sources (one main, plus 2 or 3 secondary)
		(A)	(B)	(C)
		Column N %	Column N %	Column N %
		n=1333	n=742	n=100
Food Consumption Groups	Poor Food Consumption	54.9% B C	40.2% C	21.0%
	Borderline Food Consumption	18.8%	22.8%	18.0%
	Acceptable Food Consumption	26.3%	37.1% A	61.0% A B
HHS Categories	Little to no hunger in household	35.7%	35.8%	48.0% A
	Moderate hunger in household	45.5%	43.6%	40.0%
	Severe hunger in household	18.8%	20.6%	12.0%
HFIAP (household food insecurity access scale groups)	Food Secure	8.1%	8.5%	7.2%
	Mildly Food Insecure Access	5.5%	5.0%	8.2%
	Moderately Food Insecure Access	7.9%	7.3%	9.3%
	Severely Food Insecure Access	78.5%	79.1%	75.3%
rCSI categories	No or low coping (rCSI < 4)	11.3%	9.8%	11.0%
	Moderate coping (rCSI 4-9)	8.6%	6.7%	9.0%
	High coping (rCSI 10 and higher)	80.1%	83.4%	80.0%
Recovery from drought- extent the HH was able to recover from recent drought impacts	Did not recover	70.5% B C	64.7% C	46.9%
	Recovered some, but worse off than before event	22.1%	27.2% A	37.8% A
	Recovered to same level as before event	6.6%	7.1%	13.3% A
	Recovered and better off than before event	0.8%	1.0%	2.0%

Results are based on two-sided tests. For each significant pair, the key of the category with the smaller column proportion appears in the category with the larger column proportion.
Significance level for upper case letters (A, B, C): .05[1]

1. Tests are adjusted for all pairwise comparisons within a row of each innermost sub table using the Bonferroni correction.

Food security and recovery measures were associated with the reported number of shocks experienced but in a complicated way. Acceptable food consumption was more common among those reporting higher shock exposure. On the other hand, household hunger and coping strategies employed showed a pattern in the expected direction; that is, **fewer shocks were associated with less hunger and coping while more shocks were associated with more hunger and coping**. Recovery did not show a consistent relationship.

Three wealth indicators were retained in the analysis because they accounted for most of the variability in wealth in this sample. **Improved roof type, radio ownership and owning a bed or mattress were all associated with adequate food consumption, little or no hunger, little or no use of negative coping strategies and recovering to some degree.**

Table 20: Well-being Outcomes by Number of Shocks in Past Year

		Total Number of shocks in the past year (categories)						
		none or one shock	2.00	3.00	4.00	5.00	6.00	7 or more shocks
		(A)	(B)	(C)	(D)	(E)	(F)	(G)
		Column N %	Column N %	Column N %	Column N %	Column N %	Column N %	Column N %
		n=344	n=459	n=493	n=353	n=253	n=142	n=131
Food Consumption Groups	Poor Food Consumption	48.5%	47.5%	51.1%	51.0%	45.1%	49.3%	38.2%
	Borderline Food Consumption	18.0%	19.8%	22.7%	22.9%	19.0%	13.4%	19.1%
	Acceptable Food Consumption	33.4%	32.7%	26.2%	26.1%	36.0%	37.3%	42.7% C D
HHS Categories	Little to no hunger in household	48.0% D E F G	40.3% G	38.9% G	30.9%	29.4%	28.4%	19.1%
	Moderate hunger in household	42.6%	46.0%	40.4%	46.4%	48.0%	47.5%	45.8%
	Severe hunger in household	9.4%	13.8%	20.7% A	22.6% A B	22.6% A	24.1%A	35.1% A B C
HFIAP (household food insecurity access scale groups)	Food Secure	21.5% B C D E F G	6.2%	9.0% D G	3.2%	4.3%	6.4%	0.8%
	Mildly Food Insecure Access	8.4%	7.7%	4.3%	4.9%	3.2%	4.3%	1.5%
	Moderately Food Insecure Access	6.3%	10.4%	9.6%	6.1%	7.1%	2.8%	6.9%
	Severely Food Insecure Access	63.9%	75.7% A	77.1% A	85.9% A B C	85.4% A B	86.5% A	90.8% A B C
rCSI categories	No or low coping (rCSI < 4)	24.1% B C D E F G	12.6% D E F G	10.5%	5.9%	4.7%	3.5%	3.1%
	Moderate coping (rCSI 4-9)	11.9% D G	8.9%	9.3%	4.5%	6.7%	6.3%	2.3%
	High coping (rCSI 10 and higher)	64.0%	78.4% A	80.1% A	89.5% A B C	88.5% A B	90.1% A B	94.7% A B C
Recovery from drought-extent the HH was able to recover from recent drought impacts	Did not recover	55.9%	64.7%	67.5% A	75.6% A B G	73.9% A	75.4% A	61.1%
	Recovered some, but worse off than before event	31.5% D	27.3% D	24.2%	17.6%	20.9%	19.0%	32.1% D
	Recovered to same level as before event	10.6%	7.2%	7.1%	6.8%	4.0%	5.6%	6.9%
	Recovered and better off than before event	1.9%	0.9%	1.2%	0.0%[1]	1.2%	0.0%[1]	0.0%[1]

Results are based on two-sided tests. For each significant pair, the key of the category with the smaller column proportion appears in the category with the larger column proportion.
Significance level for upper case letters (A, B, C): .05[2]

1. This category is not used in comparisons because its column proportion is equal to zero or one.

2. Tests are adjusted for all pairwise comparisons within a row of each innermost sub table using the Bonferroni correction.

Table 21: Well-being Outcomes by Wealth Ranking

		Roof Bivariate (iron, cement, wood/mud)		Radio bivariate		Bed/mattress bivariate	
		(A)	(B)	(A)	(B)	(A)	(B)
		Column N %	Column N %	Column N %	Column N %	Column N %	Column N %
		(A)	(B)	(A)	(B)	(A)	(B)
Food Consumption Groups	Poor Food Consumption	53.6% B	40.8%	50.5% B	34.9%	54.2% B	30.7%
	Borderline Food Consumption	20.0%	20.4%	20.2%	19.9%	19.9%	21.0%
	Acceptable Food Consumption	26.5%	38.8% A	29.3%	45.2% A	25.9%	48.3% A
HHS Categories	Little to no hunger in household	32.3%	42.1% A	34.5%	47.7% A	32.3%	48.1% A
	Moderate hunger in household	44.0%	45.4%	44.8%	43.3%	46.4% B	39.2%
	Severe hunger in household	23.7% B	12.6%	20.7% B	9.1%	21.3% B	12.6%
HFIAP (household food insecurity access scale groups)	Food Secure	6.2%	11.0% A	7.2%	14.7% A	6.8%	12.4% A
	Mildly Food Insecure Access	5.7%	5.1%	5.7%	4.1%	5.3%	5.8%
	Moderately Food Insecure Access	5.5%	11.1% A	7.4%	10.3%	6.0%	13.2% A
	Severely Food Insecure Access	82.6% B	72.8%	79.8% B	70.9%	81.9% B	68.5%
rCSI categories	No or low coping (rCSI < 4)	8.7%	13.9% A	9.6%	18.6% A	8.8%	16.9% A
	Moderate coping (rCSI 4-9)	6.9%	9.5% A	7.5%	10.6%	7.5%	9.4%
	High coping (rCSI 10 and higher)	84.5% B	76.6%	82.9% B	70.8%	83.8% B	73.7%
Recovery from drought- extent the HH was able to recover from recent drought impacts	Did not recover	71.5% B	61.6%	68.8% B	58.9%	71.1% B	56.2%
	Recovered some, but worse off than before event	22.4%	27.7% A	24.0%	28.4%	22.8%	29.9% A
	Recovered to same level as before event	5.6%	9.2% A	6.6%	9.9% A	5.5%	12.1% A
	Recovered and better off than before event	0.5%	1.5% A	0.6%	2.7% A	0.6%	1.7% A

Results are based on two-sided tests. For each significant pair, the key of the category with the smaller column proportion appears in the category with the larger column proportion.
Significance level for upper case letters (A, B, C): .05[1]

1. Tests are adjusted for all pairwise comparisons within a row of each innermost sub table using the Bonferroni correction.

Reported coping responses to the drought also were associated with food security outcomes and recovery, but showed different relationships with the different indicators. **Not searching for better pasture, selling livestock, slaughtering livestock, not migrating, not taking children out of school, taking out a loan from a source other than the VSLA and receipt of food aid were all associated with adequate food consumption.** Not permanently migrating, not reducing dietary consumption and receipt of food aid was associated with little or no hunger. On the other hand, **not slaughtering livestock, permanently migrating, taking children out of school and taking a loan were all associated with severe hunger**.

The relationship with the rCSI demonstrates that taking children out of school is associated with high levels of negative coping. Not reducing dietary consumption, not selling or slaughtering livestock, not migrating, not taking children out of school and receiving food aid were all associated with low levels of negative coping as reflected by the rCSI.

Acceptable food consumption was strongly related to an indicator of bridging social capital, that is, communicating regularly with someone living outside the respondent's community. The difference in **acceptable food consumption was over 22 percentage points**, one of the strongest relationships found in this data set. **Early warning also was related to acceptable food consumption**. Communicating regularly with someone outside the village was associated with the absence of hunger but receipt of early warning information was only associated with the severity of hunger. Communicating regularly with someone outside the respondent's village was associated with low coping and reporting some degree of recovery from the drought. Forty-six percent of respondents reported regularly communicating with at least one person outside their community. Only 15% of respondents reported receiving early warning information.

The **severity** of this drought shock was reflected in the overwhelming respondent rating of this drought as having a **strong impact on household income and food consumption** (59%) or the worst shock that has ever happened (30%). Those reporting that the drought shock had no impact or only a slight or moderate impact was 10%. The perceived severity of the shock was reflected in the food security and recovery indicators. There were no significant differences between those who judged the shock to be strong or the worst ever. No or lower shock severity was associated with adequate food consumption, lack of hunger, reduced coping and recovery to some degree.

Table 22: Well-being Outcomes by Common Coping Strategies – Livestock Slaughter and Migration Patterns

Well-being outcomes by common coping strategies reported in response to shock(s)		Send livestock in search of pasture?		Sell livestock?		Slaughter livestock?		Temporarily migrate?		Permanently migrate?	
		No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Note: HHs can report more than one coping strategy, they are not mutually exclusive. Coping strategies used by less than 5% of the sample were excluded from this table		(A)	(B)	(A)	(B)	(A)	(B)	(A)	(B)	(A)	(B)
		1305	870	1742	433	1795	380	1727	448	1901	274
		Column N %	Column N %	Column N %	Column N %	Column N %	Column N %	Column N %	Column N %	Column N %	Column N %
Food Consumption Groups	Poor Food Consumption	42.8%	56.7% A	52.1% B	33.3%	50.9% B	36.3%	47.0%	53.3% A	47.3%	55.1% A
	Borderline Food Consumption	22.3% B	16.9%	18.1%	28.4% A	19.0%	25.5% A	21.1% B	16.3%	19.7%	23.0%
	Acceptable Food Consumption	34.9% B	26.4%	29.9%	38.3% A	30.1%	38.2% A	31.8%	30.4%	32.9% B	21.9%
HHS Categories	Little to no hunger in household	35.7%	37.2%	36.3%	36.4%	36.1%	37.3%	35.9%	37.8%	39.3% B	15.8%
	Moderate hunger in household	41.2%	49.6 %A	45.1%	42.7%	45.5%	40.5%	44.6%	44.4%	43.7%	50.9% A
	Severe hunger in household	23.1% B	13.2%	18.7%	21.0%	18.5%	22.2%	19.5%	17.8%	17.1%	33.3% A
HFIAP (household food insecurity access scale groups)	Food Secure	7.7%	9.0%	9.1% B	4.4%	8.8% B	5.3%	8.3%	7.9%	9.1% B	2.2%
	Mildly Food Insecure Access	6.0%	4.7%	5.8%	3.9%	5.7%	4.5%	5.5%	5.4%	6.0% B	1.8%
	Moderately Food Insecure Access	6.4%	9.8% A	7.8%	7.7%	7.9%	7.1%	7.2%	10.0%	8.5% B	2.9%
	Severely Food Insecure Access	79.9%	76.6%	77.2%	84.0% A	77.6%	83.1% A	79.1%	76.7%	76.5%	93.0% A
rCSI categories	No or low coping (rCSI < 4)	11.0%	10.6%	12.3%B	4.6%	12.0% B	5.3%	10.8%	10.7%	12.0% B	2.2%
	Moderate coping (rCSI 4-9)	8.7%	6.9%	8.9% B	4.2%	8.7% B	4.2%	7.8%	8.5%	8.4% B	4.7%
	High coping (rCSI 10 and higher)	80.4%	82.5%	78.8%	91.2% A	79.3%	90.5% A	81.4%	80.8%	79.5%	93.1% A
Recovery from drought-extent the HH was able to recover from recent drought impacts	Did not recover	61.4%	76.3% A	67.3%	67.8%	67.6%	66.7%	65.3%	75.5% A	66.4%	74.3% A
	Recovered some, but worse off than before event	29.2% B	17.8%	25.2%	22.0%	24.3%	25.9%	26.1% B	18.7%	25.0%	21.6%
	Recovered to same level as before event	8.5% B	5.1%	6.6%	9.0%	7.2%	6.4%	7.7% B	4.9%	7.6% B	3.3%
	Recovered and better off than before event	1.0%	0.8%	0.8%	1.2%	0.9%	1.1%	0.9%	0.9%	0.9%	0.7%

Results are based on two-sided tests. For each significant pair, the key of the category with the smaller column proportion appears in the category with the larger column proportion. Significance level for upper case letters (A, B, C): .05[2]

1. This category is not used in comparisons because its column proportion is equal to zero or one.

2. Tests are adjusted for all pairwise comparisons within a row of each innermost sub table using the Bonferroni correction.

Table 23: Well-being Outcomes by Common Coping Strategies – Reduction Food Consumption, Food Aid, Loan and Removing Children from School

Well-being outcomes by common coping strategies reported in response to shock(s)		Take children out of school?		Reduce food consumption?		Take a loan from another source?		Receive food aid or assistance from an NGO (including food/cash for work)?	
		No	Yes	No	Yes	No	Yes	No	Yes
Note: HHs can report more than one coping strategy, they are not mutually exclusive. Coping strategies used by less than 5% of the sample were excluded from this table		(A)	(B)	(A)	(B)	(A)	(B)	(A)	(B)
		1809	366	1336	839	1766	409	1804	371
		Column N %	Column N %	Column N %	Column N %	Column N %	Column N %	Column N %	Column N %
Food Consumption Groups	Poor Food Consumption	47.9%	50.5%	47.7%	49.3%	50.1% B	40.6%	52.4% B	28.3%
	Borderline Food Consumption	19.2%	24.9% A	20.3%	19.9%	20.5%	18.6%	20.5%	18.3%
	Acceptable Food Consumption	32.9% B	24.6%	32.0%	30.8%	29.4%	40.8% A	27.1%	53.4% A
HHS Categories	Little to no hunger in household	36.2%	37.0%	39.8% B	30.8%	35.8%	38.3%	34.5%	45.1% A
	Moderate hunger in household	43.4%	50.1% A	43.1%	46.9%	46.9% B	34.6%	45.7% B	39.1%
	Severe hunger in household	20.4%B	12.9%	17.1%	22.4% A	17.3%	27.2% A	19.8%	15.8%
HFIAP (household food insecurity access scale groups)	Food Secure	9.2%B	3.0%	10.7% B	4.3%	8.3%	7.6%	7.4%	12.1% A
	Mildly Food Insecure Access	5.9%B	3.0%	6.3%B	4.1%	5.5%	5.2%	5.4%	5.5%
	Moderately Food Insecure Access	7.7%	8.0%	8.5%	6.6%	7.3%	9.6%	8.2%	5.5%
	Severely Food Insecure Access	77.1%	86.0% A	74.5%	85.0% A	78.8%	77.6%	78.9%	77.0%
rCSI categories	No or low coping (rCSI < 4)	12.2%B	3.8%	14.2% B	5.4%	11.0%	10.0%	9.9%	15.4% A
	Moderate coping (rCSI 4-9)	8.2%	6.6%	8.8%	6.7%	7.5%	10.0%	7.1%	12.1% A
	High coping (rCSI 10 and higher)	79.5%	89.6% A	77.0%	88.0% A	81.5%	80.0%	83.0% B	72.5%
Recovery from drought-extent the HH was able to recover from recent drought impacts	Did not recover	65.5%	76.9% A	68.3%	66.1%	69.2% B	59.9%	71.8% B	46.7%
	Recovered some, but worse off than before event	26.4%B	15.6%	23.5%	26.3%	23.7%	28.2%	21.6%	38.9% A
	Recovered to same level as before event	7.3%	6.1%	7.3%	6.8%	6.3%	10.4% A	5.9%	13.0% A
	Recovered and better off than before event	0.8%	1.4%	0.9%	0.8%	0.8%	1.5%	0.8%	1.4%

Results are based on two-sided tests. For each significant pair, the key of the category with the smaller column proportion appears in the category with the larger column proportion.
Significance level for upper case letters (A, B, C): .05[2]

1. This category is not used in comparisons because its column proportion is equal to zero or one.

2. Tests are adjusted for all pairwise comparisons within a row of each innermost sub table using the Bonferroni correction.

Table 24: Well-being Outcomes and Social Capital (bridging) and Receipt of Early Warning Information

		28. Do you communicate/talk regularly with at least one person outside the village?		35. Did you receive any information on early warning for natural hazards (floods, drought, etc.) in the last year?	
		No	Yes	No (or don't know)	Yes
		(A)	(B)	(A)	(B)
		Column N %	Column N %	Column N %	Column N %
Food Consumption Groups	Poor Food Consumption	59.7% B	35.1%	50.2% B	37.9%
	Borderline Food Consumption	19.1%	21.3%	20.4%	18.8%
	Acceptable Food Consumption	21.2%	43.6% A	29.4%	43.3% A
HHS Categories	Little to no hunger in household	29.1%	44.7% A	36.5%	34.9%
	Moderate hunger in household	46.1%	42.8%	43.3%	51.8% A
	Severe hunger in household	24.8%B	12.4%	20.2% B	13.3%
HFIAP (household food insecurity access scale groups)	Food Secure	7.4%	9.2%	8.5%	6.3%
	Mildly Food Insecure Access	2.9%	8.4% A	5.5%	5.4%
	Moderately Food Insecure Access	6.6%	9.2% A	7.4%	9.6%
	Severely Food Insecure Access	83.1% B	73.3%	78.6%	78.6%
rCSI categories	No or low coping (rCSI < 4)	8.5%	13.5% A	11.0%	9.6%
	Moderate coping (rCSI 4-9)	6.0%	10.2% A	7.9%	8.4%
	High coping (rCSI 10 and higher)	85.5 %B	76.3%	81.1%	82.1%
Recovery from drought- extent the HH was able to recover from recent drought impacts	Did not recover	75.9% B	57.6%	68.2%	63.2%
	Recovered some, but worse off than before event	19.0%	31.1% A	24.1%	27.0%
	Recovered to same level as before event	4.4%	10.2% A	7.0%	7.7%
	Recovered and better off than before event	0.7%	1.1%	0.7%	2.1% A

Results are based on two-sided tests. For each significant pair, the key of the category with the smaller column proportion appears in the category with the larger column proportion.
Significance level for upper case letters (A, B, C): .05[1]

1. Tests are adjusted for all pairwise comparisons within a row of each innermost sub table using the Bonferroni correction.

Table 25: Food Security (FCS) and Household Income Association with Respondent Rating of Severity of Drought-frequency

22b. How severe was the impact on your income and food consumption?		
	Frequency	**Percent**
No drought shock experienced	42	2%
None, slight, or moderate impact	181	8%
Strong impact	1292	59%
Worst ever happened	660	30%
Total	**2175**	**100%**

Table 26: Well-being Outcomes and Respondent Rating of Severity of Shock

		22b. How severe was the impact on your income and food consumption?			
		No drought shock experienced	**None, slight, or moderate impact**	**Strong impact**	**Worst ever happened**
		(A)	(B)	(C)	(D)
		Column N %	Column N %	Column N %	Column N %
Food Consumption Groups	**Poor Food Consumption**	38.1%	29.3%	48.1% B	54.5% B C
	Borderline Food Consumption	11.9%	24.3% D	22.1% D	15.8%
	Acceptable Food Consumption	50.0% C D	46.4% C D	29.8%	29.7%
HHS Categories	**Little to no hunger in household**	55.0% C	55.9% C D	33.6%	35.1%
	Moderate hunger in household	37.5%	33.0%	44.8% B	47.8% B
	Severe hunger in household	7.5%	11.2%	21.6% B	17.2%
HFIAP (household food insecurity access scale groups)	**Food Secure**	29.3% C D	20.2% C D	6.9%	6.1%
	Mildly Food Insecure Access	9.8%	12.9% C D	4.9%	4.3%
	Moderately Food Insecure Access	7.3%	6.7%	7.8%	8.0%
	Severely Food Insecure Access	53.7%	60.1%	80.4% A B	81.6% A B
rCSI categories	**No or low coping (rCSI < 4)**	31.0% C D	23.8% C D	9.4%	8.8%
	Moderate coping (rCSI 4-9)	7.1%	12.2% C	6.3%	10.2% C
	High coping (rCSI 10 and higher)	61.9%	64.1%	84.4% A B	81.1% A B
Recovery from drought- extent the HH was able to recover from recent drought impacts	**Did not recover**	100.0%[1,2]	26.4%	68.2% B	76.9% B C
	Recovered some, but worse off than before event	0.0%[1,2]	44.9% C D	25.4% D	17.5%
	Recovered to same level as before event	0.0%[1,2]	25.3% C D	6.0%	4.4%
	Recovered and better off than before event	0.0%[1,2]	3.4% C	0.4%	1.2%

Results are based on two-sided tests. For each significant pair, the key of the category with the smaller column proportion appears in the category with the larger column proportion.
Significance level for upper case letters (A, B, C): .05[3]

1. This category is not used in comparisons because the sum of case weights is less than two.

2. This category is not used in comparisons because its column proportion is equal to zero or one.

3. Tests are adjusted for all pairwise comparisons within a row of each innermost sub table using the Bonferroni correction.

In summary, this section shows that food security and recovery are associated with a variety of demographic factors, wealth and source of livelihoods, livelihood diversification, a measure of bridging social capital, shock severity measures and coping behaviors.

These data suggest that in this sample, some coping actions taken by households reflected the severity of their situations. **Moving livestock in search of pasture and human migration appeared to be late stage actions, in which animals were moved, like people, when the situation became dire**. Similarly, taking children out of school appeared to be a later stage action taken. On the other hand, **selling and slaughtering livestock, though associated with increased coping in general, were associated with better food security outcomes**. These findings are mostly consistent with the qualitative inquiry that suggested diversified livelihoods and selling and slaughtering livestock were all important for resilience. However, the qualitative assessment pointed to moving livestock in search of pasture as a positive coping strategy. It does not appear to be the case in the quantitative analysis. **Perhaps this may be because this action was taken too late**.

Testing Hypotheses about the Relationship between SomReP Program Exposures and Well-being Outcomes

Annex 4 shows the persistent relationship between well-being outcomes and SomReP program exposures. Savings Groups and CfW appear to have the most persistent effects and are the only interventions that predict acceptable food security, regardless of the approaches used and the variables controlled for in the analysis. All five of the high impact interventions contributed to improved food consumption scores and these effects were linear, meaning that the effects were additive, or put simply, more was better. In fact, the PMS analysis, that compared high levels of high exposure (3 or more interventions) with no interventions, illustrated a more than a 27% increase in acceptable food security levels.

The total number of exposures to non-high impact activities was not significantly related to well-being outcomes. This may be because these exposures were only measured at the village and not the individual level or it may be because the large number of interventions results in fragmentation of resources (spreading resources too thin). This is important and in the future, data should be collected to explore the question of program focus versus comprehensiveness.

Another important finding, possibly associated with SomReP interventions, was that households that reported regular communication outside their village/communities also had consistently higher food security outcomes. This finding again persisted in all but one model (HHS as outcome). It is hard to interpret this finding because it is not clear what pathway might link outside communication to well-being from the data collected.

Other important predictors of Food Consumption and Household Hunger Scores include livelihood zone and type (pastoralists and peri-urban were worst off while salaried/self employed and crop or mixed farmers were best off). Multiple income sources had a strong effect. Drought severity as reported by respondents was significantly related to outcomes as were selling livestock as a coping strategy (positive) and taking children out of school (negative).

Different approaches were taken to control for possible selection bias (program participants may have been better off to start with). The analysis controlled for possible selection bias through multiple regression techniques as well as Propensity Score Matching.

Section VIII: Program Exposure

PDs were more likely to have been exposed to some high impact programs. VSLA exposure showed the largest difference (nearly 20% points higher). Early warning committee membership was greater than 13% higher; water greater than 9% higher. PDs also were more likely to be exposed to multiple project interventions (2 or more).

This analysis comparing the profiles of PDs and non-PDs from household survey data shows some similarity and some difference to the qualitative study. PDs demonstrated somewhat superior socio-economic status, better food security outcomes and some coping mechanisms mentioned during the qualitative work. They also were more likely to be exposed to some high impact interventions and to be exposed to more high impact programs.

The findings differ, however, in several important ways. PDs felt that the drought was the worst they experienced. They did not seem to be less likely to experience severe sequelae of shocks and specific types of shocks than non-PDs. They also reported more frequently what is considered the negative coping behavior of taking children out of school. This is a common finding that is most likely explained by the fact that PDs have children in school in the first place, while non-PDs do not. Also notable is that there were no significant differences in livelihood strategies between PDs and non-PDs.

That similarities and differences between PDs and non-PDs exist in the findings is not surprising, given the methodological limitations of this study. First is the small sample size of PDs in this data set. Secondly, fielding questions over the phone and the limited time to pilot the quantitative study may have rendered the questionnaire less sensitive for detecting differences.

Nevertheless, the analysis comparing survey data on PD and non-PD households supports key conclusions of the qualitative study, namely:

- PDs are better off socio-economically
- PDs have better access to programs
- PDs appeared better able to liquidate livestock in response to the drought, probably earlier in the drought cycle
- PDs are more likely to be food secure and especially more likely to report that they are not experiencing hunger

Table 27: Positive Deviant Households - Exposure to Program Activities

		Positive Deviant HH (classified as positive deviant by researchers)	
		NOT a pos. dev (but lives in community that was evaluated for positive deviants)	Positive Deviant HH
		(A)	(B)
Participation in/benefit from high-intensity programs (plus CFW), and total number of high-intensity programs household participates in.		Column N %	Column N %
HH benefits from VSLA/savings activities		12.1%	33.3%A
HH needs/uses CAHW (in response for time-distance to nearest CAHW)		34.3%	36.2%
HH participation in in EW OR Drought committee activities		14.1%	27.6% A
HH benefits from Water Access activities		19.1%	28.6% A
HH participation in CFW activities		19.8%	21.9%
HH Number of HIGH Impact activities the HH participates in/ benefits from (VSLA, EW, CAHW, Water)	None	44.6% B	32.4%
	1.00	37.3%	30.5%
	2.00	12.7%	22.9% A
	3 or 4 high intensity (VSLA, CAHW, EW, Water)	5.4%	14.3% A

Results are based on two-sided tests. For each significant pair, the key of the category with the smaller column proportion appears in the category with the larger column proportion.
Significance level for upper case letters (A, B, C): .05[1]

1. Tests are adjusted for all pairwise comparisons within a row of each innermost sub table using the Bonferroni correction.

Section IX: Conclusions and Recommendations

Conclusion 1:

Despite its limitations, this study supports the conclusion that SomReP's programming is building resilience and that it made a difference for targeted households and communities during the last drought. **High impact interventions, particularly VSLAs and preparedness related activities were consistently related with both community identification of successful coping as well as food security status**. It also is clear that **exposure to high intensity interventions had an additive effect on food security; that is, the more high impact interventions implemented in villages and benefiting households the higher the food security status**. In the end there were five high impact interventions, including Cash for Work.

Given the number of activities implemented (62) by SomReP partners, it was impossible with this type of study, to assess which ones are better than others with respect to resilience. The most this study could do was to evaluate the relationship between what were defined as high impact interventions and well-being outcomes. It is only with subsequent rounds of data collection and the accumulation of panel datasets that we will be able to understand the relationships of other activities to each other and their role in building resilience. The large array of activities was very difficult to track.

Recommendation 1:

SomReP should focus its programming efforts, at least initially, on high impact interventions.

Conclusion 2:

From various perspectives, SomReP programs were insufficiently shock responsive. IPs were unable to intervene with humanitarian safety net programs in a timely and vigorous fashion. In some cases, this had an impact on VSLA functioning, and it certainly had a negative impact on food security.

Recommendation 2:

SomReP should increase its preparedness to ensure that safety net programs in targeted program areas are rapidly implemented in the face of large co-variate shocks. Whether this is done through MOUs with the World Food Program or crisis modification mechanisms within its own programs, additional resources must flow to areas affected by large covariate shocks in a timely way.

Safety net strategies should be more carefully studied by SomReP as they may vary according to the types of resilience programs being implemented by SomReP. Savings Group members suggested providing cash grants to the SGs. Others suggested that CFW should have been implemented more widely and for a longer period of time.

Conclusion 3:

VSLAs apparently do not reach the most vulnerable in program targeted communities. Only those households who can afford to save seek membership. So while VSLAs did benefit families and communities in which they were established, given the low coverage of households in targeted communities, additional effort is needed to ensure needs of the most vulnerable are met.

Similarly, targeting for other high impact interventions did not appear to be sufficiently deliberate nor was there a clear vision of the anticipated end state of SomReP targeted communities.

Recommendation 3:

SomReP should sequence, layer and target interventions to ensure that the most needy can embark on resilience pathways. CFW should be explored as it is a very popular intervention in rural communities because it both puts resources in the hands of the poorest while building community assets to improve water access and natural resources management.

SomReP should conduct a study to determine thresholds in the amount and timing of various high impact interventions in different segments of its target population, namely; IDPs, pastoralists, agro-pastoralists, peri-urban, the poorest segment of community. Through this type of work, SomReP should be able to better target and layer its interventions to help different beneficiary groups enter on and graduate from resilience building programs.

Conclusion 4:

Households in SomReP targeted communities were not sufficiently aware of program activities and therefore participation levels also were low.

Recommendation 4:

SomReP should focus more program resources on program awareness raising in targeted communities.

Conclusion 5:

Data quality on program exposure is an important concern. There were inconsistencies in data about where project activities were being implemented and the research team could not obtain information about the amounts and quality of programs. For example, basic data on the quantity of savings and loan distributions were not available to corroborate findings that VSLAs were contributing to food security improvements. As has been found elsewhere, the lack of meaningful program exposure and process information is a major impediment to sound evaluation of resilience building interventions.

Recommendation 5:

SomReP should develop a standardized program management reporting system that is based on beneficiary registration and project level tracking of resource flows.

Conclusion 6:

The use of a Positive Deviance framework to assess program contributions posteriori has merit as an analytical strategy. While attribution is challenged by the lack of rigorous counterfactuals, the approach can build a logical convergence of evidence about program contributions to resilience in the presence of large covariate shocks. However, the findings are limited by the lack of an a priori evaluation framework and prospective data collection strategy. The approach also does not permit adequate analysis of the effects of community level exposures on aggregate well-being.

Recommendation 6:

SomReP should develop an evaluation framework and data collection, management and analysis strategy a priori for future rounds of programming. The framework should take into account the multi-level strategy of resilience programming (community and household level improvements); combine good routine process monitoring as discussed above with on-going monitoring of shock exposure, coping and household well-being so that SomReP will have a better understanding of how program exposures enable or not households to manage risks and shocks. In addition, SomReP should better incorporate the multi-level nature of resilience programming in to an evaluation strategy by increasing the number of communities included in evaluation surveys, include adequate numbers of households within communities, and measuring key community attributes that affect both program exposure and outcomes.

Conclusion 7:

Improvements in field research quality control are needed. Several inconsistencies within the data set can be eliminated in the future with more careful formulation and testing of data collection instruments, improved training and increased supervision. Additional research also is needed to identify and adjust for selection and other forms of bias introduced by mobile survey methods.

Recommendation 7:

More time and resources should be devoted to field data collection. Research should be commissioned to evaluate the bias, if any, introduced by mobile phone surveys.

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Annex 1: SomReP Unified Log Frame

Result 1: Improved adaptive capacity of individuals, HHs and communities through support to livelihood diversification and improved access to markets, financial services, and basic livelihood services	
Output 1.1: Animal Health and Productivity Enhanced	Activity 1.1.1: Promotion of improved animal health services and related husbandry practices
	Activity 1.1.2: Improving access to markets and value addition for selected animal value chain(s)
	Activity 1.1.3: Access to effective markets and economic opportunities for the target beneficiaries enhanced
Output 1.2: Improved crop production and productivity (in agro-pastoral communities)	Activity 1.2.1: Promotion of Good Agricultural Production practices for selected crop value chains
	Activity 1.2.2: Train agro - pastoralists on fodder production and storage and provide access to storage facilities
	Activity 1.2.3: Train farmers in techniques for using more drought-tolerant or faster-maturing crop varieties
Output 1.3: Access to effective markets and economic opportunities for the target beneficiaries enhanced.	Activity 1.3.1: Improving access to markets and post-harvest handling (storage/value addition) of selected crop value chains
	Activity 1.3.2: Strengthening the capacity of farmers to meet market requirements through improved quality and volume of production
	Activity 1.3.3: Increasing incomes of rural households through strengthened commercial links between small holder farmers and buyers
Output 1.4: Vulnerable Populations supported to access marketable skills and livelihood opportunities	Activity 1.4.1: Promote business development services among HHs
	Activity 1.4.2: Link women and youth to vocational training opportunities, providing attendance costs where necessary
	Activity 1.4.3: Women, men and youth provided with short-term employment as a result of SomReP
Result 2: Improved absorptive capacity of HHs and communities through collective action in support of effective disaster risk management, adoption of positive coping strategies and improved access to formal & informal safety nets	
Output 2.1: Communities supported to develop risk-reduction strategies	Activity 2.1.1: Support communities to develop own risk reduction processes
Output 2.2: Vulnerable households and communities supported to develop contingency resources and linked to Early Warning and Early Action Systems.	Activity 2.2.1: Communities supported to develop own contingency resources tied to early warning indicators Unconditional Cash Transfers Water Distribution Emergency animal health interventions
	Activity 2.2.2: Strengthen and link self-help mechanisms to early action system
	Activity 2.2.3: Accountability systems linked with Radio Ergo talk back programme
Output 2.3: Households supported to access savings and credit facilities	Activity 2.3.1: Women, men and youth groups establish community managed savings and loan schemes
Result 3: Eco-system health improved through promotion of equitable and sustainable natural resource management	
Output 3.1: Natural Resource Management initiatives enhanced to provide adequate pasture for livestock and enabling support for agriculture.	Activity 3.1.1: Support communities to maintain and improve natural resources through holistic rehabilitation
	Activity 3.1.2: Make existing community natural resources accessible to the vulnerable during dry & drought periods
	Activity 3.1.3: Support communities to maintain and improve natural resources through holistic rehabilitation
	Activity 3.1.4: Make existing community natural resources accessible to the vulnerable during dry & drought periods
	Activity 3.1.5: Community rangeland & water management processes developed and implemented and linked to formal regulation

Output 3.2: Access to water for irrigation, livestock watering and domestic use improved through development of water resources (References to water here refer to exploitation for agriculture and livestock)	Activity 3.2.1: Households and communities' capacity and skills built to manage local water resources
	Activity 3.2.2: Water infrastructure supported for productive use during drought periods
Result 4: Transformative capacity of community governance improved	
Output 4.1: Community-Based Resilience groups strengthened to function effectively	Activity 4.1.1: Capacity needs assessment of groups and institutions identified as key to community management, community-to-community relations, rangeland management, natural resource management, social inclusion, conflict resolution or others important to resilience-building
	Activity 4.1.2: Build the capacity of local government in leadership, governance and technical areas
	Activity 4.1.3: Support formation of community-level interest groups (linked to district-level cooperatives or other orgs) around processing of specific farm produce e.g. horticultural crop
Output 4.2: Enhanced community assets to strengthen resilience among the targeted vulnerable communities	Activity 4.2.1: Train institutions to provide support to local pastoralists on mobility, splitting of herds, promoting mixed herds, and emergency livestock off-take activities based on capacity assessment findings
	Activity 4.2.2 Pastoralists enabled to access critical information that supports their livelihood and assets
Output 4.3: Laws and Policies for equitable and sustainable governance on local and national resources strengthened, disseminated and applied at the community level	Activity 4.3.1: Advocate for higher quality certification and veterinary services and boards, including increased investment where necessary
	Activity 4.3.2: Establish or strengthen local institution(s)/authorities and processes for drought-time natural resource management
Result 5: Program Learning & Research generated and shared among relevant stakeholders (including communities, NGOs and governments)	
Output 5.1: Forums established and facilitated to provide feedback, share and disseminate knowledge and experience on resilience	Activity 5.1.1: Hold dissemination forums for sharing of knowledge on resilience
	Activity 5.1.2: Conduct research or studies on resilience in Somalia
Output 5.2: Community resilience enhanced through learning processes/sessions through experience sharing	Activity 5.2.1: Conduct field sessions with beneficiaries, sharing their experiences – Lessons learnt community meetings, community exit meetings, Most Significant Change (MSC), community feedback sessions
	Activity 5.2.2: Hold periodic stakeholders' meetings to share experience on SomReP progress – (mid-term reviews, community forums to disseminate evaluation findings, progress reports, joint planning, redesigning and monitoring)

Annex 2: Qualitative Instruments

Appendix 2A: Focus Group Discussion Guide Master Version

District:	Interviewer:
Village:	Recorder:
Date:	FG Type:
Start Time:	End Time:

Notes to the investigator(s):

While these questions are presented to guide the discussion, this is best treated as a conversation with the community. Ensure all participants register and provide consent prior to beginning (ENSURE PHONE NUMBERS ARE PROVIDED IN THE CASE WHERE PARTICIPANTS CONSENT TO DO SO).

Module 1 – Resilience and Success	ALL FGDs
1.1	Here in this community, what does a resilient household look like? a. What makes them resilient? (Probe for details around how resilience is defined, how it is recognized, details). b. What makes them different from other households? (Probe for details around resources/wealth, livelihoods, assets, access to services like markets and health posts, behaviours, relationships or social support, activities, education/information.)
1.2	What are the main differences between a community that successfully responds to a shock/stress and one that does not? (Probe for details around what is meant by success in this context.) a. Which of these differences is the most important to successfully respond to a shock/stress?
1.3	Is there someone or some group in your community that you believe has been successful at responding to a challenge that you or others struggled with? (Probe around the following): a. What was the situation? b. How do you know they were successful (what did success look like)? c. What did they do that was different? d. What else about them was different? (Aside from the action taken - probe for details around resources/ wealth, livelihoods, assets, access to services like markets and health posts, behaviours, relationships or social support, activities, education/information.)

Module 2 – The recent drought and coping	ALL FGDs
2.1	Did the recent drought affect this community? a. If not, are you concerned that it will affect this community in the future? Why or why not? (CONTINUE TO 2.2) b. If yes, how did the drought affect this community? i. Duration and severity ii. Impact (whole community, women, men, children, elders, individuals with disabilities, minority groups, different groups within the community) c. People impacted less? How? (Probe to understand why these people were more impacted in detail – discuss differences in resources/wealth, livelihoods, assets, access to services like markets and health posts, behaviours, relationships or social support, activities, education/information.) d. People impacted more? How? (Probe to understand why these people were more impacted in detail – discuss differences in resources/wealth, livelihoods, assets, access to services like markets and health posts, behaviours, relationships or social support, activities, education/information.) e. What are people doing/what did people do in response to the drought? (Probe to understand what actions were taken/are being taken to cope – Sell assets? Reduce spending? Migrate? Rely on community support? Seek help from outside sources? Other action?) f. Did some of the community do better during the drought than others? i. Why? ii. What makes them different from other members of the community? (Probe for details around resources/wealth, livelihoods, assets, access to services like markets and health posts, behaviours, relationships or social support, activities, education/information.) g. Did some of the community experience the drought or its consequences at a later time than others (the drought took longer to impact them)? i. Why? ii. What makes them different from other members of the community? (Probe for details around resources/wealth, livelihoods, assets, access to services like markets and health posts, behaviours, relationships or social support, activities, education/information.) iii. Did they so better during the drought overall? h. Did some of the community recover from the drought faster than others? i. Why? ii. What makes them different from other members of the community? (Probe around differences in resources/wealth, livelihoods, assets, access to services like markets and health posts, behaviours, relationships or social support, activities, education/information.) i. What have been the most effective actions to deal with the drought / reduce the impact of the drought? i. Why have these actions been effective? ii. Who in the community has been able to use these actions to respond to drought?
2.2	HELPING WITHIN THE COMMUNITY: Do people in the community help each other during times of emergency or crisis? What does this look like? What kinds of resources are shared? Who are they shared with? What does the community do together to help recover from a crisis?
2.3	HELPING OTHER COMMUNITIES: Do people in the community help people outside of the community during times of emergency or crisis? (Probe to understand what type of help, who is it provided to, how often, what is the result.)
2.4	HELP FROM OTHER COMMUNITIES: Do people in the community receive help from people outside the community during times of emergency or crisis? (Probe to understand what type of help, who is it provided to, how often, what is the result.)
2.5	HELP FROM OTHER SOURCES: To whom does the community turn to for assistance during crises like drought? What kind of assistance do they provide? How reliable is this/are these sources of assistance? How does this affect the community?

Module 2 – The recent drought and coping	PD ONLY
2.6	Think back to how you successfully responded to a challenge or crisis, or how you are responding right now (Probe): a. How is what you have done different from others? b. What was the outcome/result? c. If you have been successful, why have you been successful? (Probe for details around resources/wealth, livelihoods, assets, access to services like markets and health posts, behaviours, relationships or social support, activities, education/information.) d. What motivated you to do what you did/why did you decide to do that? e. Did you consider other options? What were they? f. Why do you think others have perceived you as being particularly successful in addressing this challenge? g. Do you think others in your community could do what you did/do? Is there any advice you would share about what you did/do? h. If others in the community did what you did, what do you think the outcome would be?

Module 3 – Savings Groups	NON-VSLA ONLY
3.1	Are there savings groups (VSLAs) in this village? a. Who supports the savings group/VSLA (what organization/project)? b. How do they work? c. What do you think about them? d. Do they help members in times of drought? e. How are people who are members different from people who are not? (Probe for details around resources/wealth, livelihoods, assets, access to services like markets and health posts, behaviours, relationships or social support, activities, education/information.)
3.2	If there are not savings groups (VSLAs) in this village, have you heard about them? a. Who supports the savings group/VSLA (what organization/project)? b. What have you heard about them?

Module 3 – Savings Groups	VSLA ONLY
3.1	How are members of a savings group (VSLA) different from people who are not members? (Probe for details around resources/wealth, livelihoods, assets, access to services like markets and health posts, behaviours, relationships or social support, activities, education/information.)
3.2	Does your savings group (VSLA) have an emergency or social savings fund? a. How has it been used? b. What do you think about it? c. Is this fund helpful? Why or why not?
3.3	How does being a member of a savings group (VSLA) help to reduce the impacts of shock/stress such as the most recent drought? a. How is this different from people who are not members of a savings group (VSLA)? b. What could make your savings group (VSLA) more helpful in reducing the impacts of shock/stress?
3.4	How does being a member of a savings group (VSLA) help to prepare for any future shock/stress? a. How is this different from people who are not members of a savings group (VSLA)? b. What could make your savings group (VSLA) more helpful in preparing for any future shock/stress?
3.5	During the recent drought, how did being a member of a savings group (VSLA) affect you/your response? a. Are there any differences between what you did in response that non-members did not do?
3.6	What is the most important result of being a savings group (VSLA) member? (Probe along financial, social, personal, etc.)
3.7	What are the successes of your savings group (VSLA)?
3.8	What advice would you share to a new savings group (VSLA)? Someone who wants to join a savings group (VSLA)?

Module 4 – Project and activities	ALL FGDs
4.1	Of the projects/activities that take place in your community, which are the most effective? a. Why? b. How have these project/activities impacted the community? c. How do these projects/activities help to reduce the impact of shocks/stresses? d. How are people who participate in these projects/activities different from people who do not participate? (Probe for details around resources/wealth, livelihoods, assets, access to services like markets and health posts, behaviours, relationships or social support, activities, education/information.) e. Who runs these projects/activities (NGO, Governmental organization, etc.)?
4.2	Of the activities run by SomReP/ORGANZATION OR PROJECT NAME, which are the most effective? a. Why? b. How have these project/activities impacted the community? c. How do these projects/activities help to reduce the impact of shocks/stresses? d. How are people who participate in these projects/activities different from people who do not participate? (Probe for details around resources/wealth, livelihoods, assets, access to services like markets and health posts, behaviours, relationships or social support, activities, education/information.)

Module 5 - Closing	ALL FGDs
5.1	In your opinion, is there anything else we should have discussed?
5.2	Is there anything you would like to add?

Closing consent (repeats some of consent from before):

If I decide to publish some information, can I use your name? Or would you prefer that I do not use your name? There is no problem if you prefer to remain anonymous.

As discussed, we took some photos during the discussion. If you would prefer that these photos not be saved, please let us know. It is not a problem to delete photos of the group as a whole or to delete certain photos.

Thank all the participants for their time and willingness to participate in the discussion.

NOTE:

Ensure the participant list is completed. Do not forget to note the length of the interview.

Annex 2B: Key Informant Interview Guide with Community Leaders

Interviewee Information			
Date		Name	
District		Age	
Village		Sex	
Phone number			
Title/Role			
Interviewer		Recorder	
Start time		End time	

Prompts for Community Leaders

1. Here in this community, what does a resilient household look like?
   a. What makes them resilient? *(Probe for details around how resilience is defined, how it is recognized, details.)*
   b. What makes them different from other households? *(Probe for details around resources/wealth, livelihoods, assets, access to services like markets and health posts, behaviours, relationships or social support, activities, education/information.)*

2. What are the main differences between a community that successfully responds to a shock/stress and one that does not? (Probe for details around what is meant by success in this context.)
   a. Which of these differences is the most important to successfully respond to a shock/stress?

3. Is there someone or some group in your community that you believe has been successful at responding to a challenge that others struggled with? (Probe around the following):
   a. What was the situation?
   b. How do you know they were successful (what did success look like)?
   c. What did they do that was different?
   d. What else about them was different? (Aside from the action taken)

4. Did the recent drought affect this community?
   a. If not, are you concerned that it will affect this community in the future? Why or why not? *(CONTINUE TO QUESTION 5)*
   b. If yes, how did the drought affect this community?
      i. Duration and severity
      ii. Impact (whole community, women, men, children, elders, individuals with disabilities, minority groups, different groups within the community)
      iii. People impacted less? How? *(Probe to understand why these people were not as impacted in detail.)*
      iv. People impacted more? How? *(Probe to understand why these people were more impacted in detail.)*
   c. What are people doing/what did people do in response to the drought? *(Probe to understand what actions were taken/are being taken to cope – Sell assets? Reduce spending? Migrate? Rely on community support? Seek help from outside sources? Other action?)*
   d. Did some of the community do better during the drought than others?
      i. Why?
      ii. What makes them different from other members of the community?
   e. Did some of the community experience the drought or its consequences at a later time than others (the drought took longer to impact them)?
      i. Why?
      ii. What makes them different from other members of the community?
      iii. Did they so better during the drought overall?
   f. Did some of the community recover from the drought faster than others?
      i. Why?
      ii. What makes them different from other members of the community?
   g. What have been the most effective actions to deal with the drought / reduce the impact of the drought?
      i. Why have these actions been effective?
      ii. Who in the community has been able to use these actions to respond to drought?
   h. Based on your experience with facing this challenge, what are some of the things you have learned that you want to share with others?

5. Of the projects/activities that take place in your community, which are the most effective?
   a. Why?
   b. How have these project/activities impacted the community?
   c. How do these projects/activities help to reduce the impact of shocks/stresses?
   d. How are people who participate in these projects/activities different from people who do not participate?
   e. Who runs these projects/activities (NGO, Governmental organization, etc.)?

Annex 2C: Key Informant Interview Guide with Positive Deviants

Interviewee Information			
Date		Name	
District		Age	
Village		Sex	
Phone number			
Role/ membership			
Interviewer		Recorder	
Start time		End time	

Prompts for Positive Deviants

1. Here in this community, what does a resilient household look like?
   a. What makes them resilient? *(Probe for details around how resilience is defined, how it is recognized, details).*
   b. What makes them different from other households? *(Probe for details around resources/wealth, livelihoods, assets, access to services like markets and health posts, behaviours, relationships or social support, activities, education/information.)*

2. What are the main differences between a household that successfully responds to a shock/stress and one that does not? *(Probe for details around what is meant by success in this context.)*
   a. Which of these differences is the most important to successfully respond to a shock/stress?

3. Did the recent drought affect you?
   a. If not, are you concerned that it will affect you in the future? Why or why not? *(CONTINUE TO 4)*
   b. If yes, how did the drought affect you?
      i. Duration and severity
      ii. Impact *(Probe to understand if the impact on them was this similar to or different from others – did they do better, worse or more or less equal to most of the community?)*

4. What are the strategies you use to protect your household and family in times of drought? *(Probe to understand if these strategies are to cope before, during or after the drought.)*
   a. What is the most important thing you do to protect your household and family in times of drought (most important strategy to deal with drought)? Why is this important?
   b. Rank the different strategies you discuss in terms of importance, discussing why.

5. Others in your community/program staff observed that (you have been more successful than others in dealing with CHALLENGE/ you have taken ACTION). (PROVIDE ADDITIONAL DETAIL AS NECESSARY, BUT DON'T LEAD, THIS SECTION SHOULD BE RESPONSIVE TO THE SPECIFICS OF THE PERSON'S ACTIONS/ SUCCESS). Probe around:
   a. What did you do? Could you share more about what you did? When was it?
   b. How is what you have done different from others?
   c. What was the outcome/result?
   d. If you have been successful, why do you think you have been successful? *(Probe for details around resources/wealth, livelihoods, assets, access to services like markets and health posts, behaviours, relationships or social support, activities, education/information.)*
   e. What motivated you to do what you did/why did you decide to do that?
   f. Did you consider other options? What were they?
   g. Why do you think others have perceived you as being particularly successful in addressing this challenge?

h. Do you think others in your community could do what you did/do? Is there any advice you would share about what you did/do?
i. If others in the community did what you did, what do you think the outcome would be?

6. Is there someone or some group in your community that you believe has been successful at responding to a challenge that you or others struggled with?
   a. What was the situation?
   b. How do you know they were successful (what did success look like)?
   c. What did they do that was different?
   d. What else about them was different? *(Aside from the action taken - probe for details around resources/wealth, livelihoods, assets, access to services like markets and health posts, behaviours, relationships or social support, activities, education/information.)*

7. Are you a member of a savings group? *(IF NO, ASK a. AND b. THEN PROCEED TO 8.)*
   a. What are the benefits/positives of being a savings group member?
   b. How are members of a savings group (VSLA) different from people who are not members? *(Probe for details around resources/wealth, livelihoods, assets, access to services like markets and health posts, behaviours, relationships or social support, activities, education/information.)*
   c. How does being a member of a savings group (VSLA) help to reduce the impacts of shock/stress such as the most recent drought?
      i. How is this different from people who are not members of a savings group (VSLA)?
   d. How does being a member of a savings group (VSLA) help to prepare for any future shock/stress?
      i. How is this different from people who are not members of a savings group (VSLA)?
   e. During the recent drought, how did being a member of a savings group (VSLA) affect you/your response?
      i. Are there any differences between what you did in response that non-members did not do?
   f. What is the most important result of being a savings group (VSLA) member? *(Probe along financial, social, personal, etc.)*

8. Do you participate in any activities with SomReP, (ORGANIZATION) or (PROJECT NAME)? Which ones?
   a. What are the benefits/positives of participating in these activities?
   b. What advantages does participating in these activities offer during crisis/shock?
      i. How is this different from people who do not participate in these activities?
   c. If you participate in more than one activity, which activity is the most important for helping during times of crisis/shock? How does it help?

Annex 2D: Consent Script for Focus Group Discussions and Key Informant Interviews

Note to researchers:

Consent to participate must be acquired prior to beginning the discussion. Prior to registering participants or beginning the discussion, the following should be read out loud.

My name is _____ and I am accompanied here by _____. We are doing a study about how households and communities throughout Somalia/ Somaliland respond to challenges. Today, we would like to speak with you about life here in your community and how you are addressing different challenges.

You are being asked to participate because you are a member of the community and we value your experience and perspective. We would like to learn from you and will be sharing back with the community as a whole the information that we gather during this process.

We do not bring any benefits or projects and this study is not related to direct funding to the community.

This study is taking place in your community as well as about 20 other communities in Somalia and Somaliland.

If you do not want to speak with us or do not have time, it is not a problem. Whether you decide to speak with us or not, it will not affect your relationship with SomReP, [ORGANIZATION WORKING HERE] or any other organization.

Although we ask you to provide your name and other information about yourself, we will not link anything you say to your name or other personal information that could identify you unless you provide your permission.

If you need to leave at any time or otherwise decide you no longer want to participate, you are free to do so at any moment and this will also not affect your relationship with SomReP, [ORGANIZATION WORKING HERE] or any other organization. You can also choose not to respond to any question asked if you do not want to. The choice is yours alone and there are no consequences for choosing not to respond to a question or for ending your participation in the discussion.

If you decide to participate, nothing you share in this discussion will affect your relationship with SomReP, [ORGANIZATION WORKING HERE] or any other organization. The discussion can last from 1 to 1.5 hours.

If there is anything in the discussions that you find difficult or upsetting to talk about, you can exit the discussion at any time or not respond to or talk about any specific question. The choice is yours alone and there are no consequences for choosing not to respond to a question or for exiting the discussion.

Although we ask about some personal information such as your mobile phone number, you are not required to provide any of this information. The purpose of collecting your mobile phone number is to be able to follow-up on certain questions or issues in the future.

Do you have any questions?

If there are no more questions, do you agree to participate?

At this stage, do you want to keep your name private?
At this stage, would you mind if you are included in photos of the group?
Are you willing to provide your phone number?

You can change your mind at any point. We will return to these questions at the end of the discussion.

Annex 3: Quantitative Instrument

Filled by the Enumerator	
Tracking Sheet Number	
Partner Organization	
Date of Survey	
Region	
District	
Village	
Name of Enumerator	
Enumerator ID	

Module 1: Consent

I am_____ from Forcier Consulting calling on behalf of SomReP. We are conducting a survey on the recent drought and the well-being of households in this area. You are invited to participate because you are a member of the community and we want to know what you think and do about these issues. We would like to gather your knowledge, experience and understanding.

We think the topics and questions we would like to discuss with you are not upsetting or private. If you chose to participate, we will protect all the information you provide and keep anything you provide anonymous and confidential.

This survey is taking place in your community and other communities throughout Somalia/Somaliland. The call should take approximately 30-45 minutes of your time and your participation is entirely voluntary. You can stop the interview at any time or not respond to any question and there are no consequences for choosing not to respond to a question or for ending the interview.

You may not personally directly benefit from this call. However, we hope that the information and knowledge you provide will help SomReP design and implement programs that can better support people and communities throughout Somalia and Somaliland.

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 concerns or complaints, please contact the SomReP partner in your area.

Question		Responses/Coding		Skip
101	If you do not have any (more) questions, can you let me know here if you agree to be a part of this call and have your responses recorded?	Yes No I don't know/Unsure	1 2 99	⇒M2 ⇒END ⇒Probe

Module 2: Respondent Information

NOTE: Thank you. I would like to ask you a few questions about yourself before starting the interview.

Question		Responses/Coding		Skip
201a	What is your first name?	[Text] I don't know/Unsure I prefer not to answer/ no answer	 99 66	
201b	What is your second name (family name/surname)?	[Text] I don't know/Unsure I prefer not to answer/ no answer	 99 66	
202	How old are you?	[Integer] I don't know/Unsure I prefer not to answer/ no answer	 99 66	
203	What is your sex?	Male Female I don't know/Unsure I prefer not to answer/ no answer	1 2 99 66	
204	What telephone number can we reach you on, if we have any follow up questions?	[Phone number] I don't know/Unsure I prefer not to answer/ no answer	 99 66	
204	What is your relationship to the household head?	Head Spouse Child of head/spouse Parent of head/spouse Sibling of head/spouse Other relative (specify) Not related Other (specify) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 4 5 6 7 8 99 66	
205	What is the highest level of education you have completed?	Never attended Primary incomplete Primary complete Secondary incomplete Secondary complete Incomplete higher education Completed higher education Adult literacy program Other literacy program Some mosque education Other (specify) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 4 5 6 7 8 9 10 11 99 66	
206	What is your marital status?	Never married Married Separated/Divorced Widow/widower Other (specify) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 4 5 99 66	
207	How many people live in the household?	[Integer] I don't know/Unsure I prefer not to answer/ no answer	 99 66	
208	How many people under 17 years of age live in the household?	[Integer] I don't know/Unsure I prefer not to answer/ no answer	 99 66	
209	How many children from the household are currently in school?	[Integer] I don't know/Unsure I prefer not to answer/ no answer	 99 66	
210	What is the highest school grade that the female head/spouse has completed?	Never attended Primary incomplete Primary complete Secondary incomplete Secondary complete Incomplete higher education Completed higher education Adult literacy program Other literacy program Some mosque education Other (specify) No female head/spouse I don't know / Unsure I prefer not to answer/ no answer	1 2 3 4 5 6 7 8 9 10 11 12 99 66	

211	What is your main source of income from last season? [Select one]	Farm/crop production and sales Livestock production and sales Agricultural wage labour (crop/livestock) Non-agricultural wage labour Salaried work (agricultural) Salaried work (non-agricultural) Sale of wild/bush products (e.g., honey, charcoal) Handicrafts Household/ domestic/housewife (unpaid) Childcare/domestic work (paid) Fishing Other self-employment/ own business (non-agricultural) Remittances Other (specify) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 4 5 6 7 8 9 10 11 12 14 13 99 66	
212	What are your other sources of household income from last season? [Select all that apply]	Farm/crop production and sales Livestock production and sales Agricultural wage labour (crop/livestock) Non-agricultural wage labour Salaried work (agricultural) Salaried work (non-agricultural) Sale of wild/bush products (e.g., honey, charcoal) Handicrafts Household/ domestic/housewife (unpaid) Childcare/domestic work (paid) Fishing Other self-employment/ own business (non-agricultural) Remittances Other (specify) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 4 5 6 7 8 9 10 11 12 14 13 99 66	

Module 3: Housing Characteristics

NOTE: Thank you for these answers. Now let's begin the interview. The next few questions will be about your house and living place.

Question		Responses/Coding		Skip
301	What materials have been used to construct the roof of your dwelling?	Corrugated iron Cement Thatched Wood and mud Reed/bamboo and thatched Plastic sheeting Cloth No roof Other (specify) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 4 5 6 7 8 9 99 66	
302	What materials have been used to construct the floor of your dwelling?	Earth Cow dung Concrete/stone/cement Tile/bricks Mats/rugs/animal skins Other (specify) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 4 5 6 99 66	
303	Excluding the kitchen and toilet, how many rooms are in your dwelling?	[Integer] I don't know / Unsure I prefer not to answer/ no answer	 99 66	
304	What type of latrine do you have/use?	No toilet Flush toilet, private Flush toilet, shared Pit latrine with slab, private Pit latrine with slab, shared Pit latrine without slab, private Pit latrine without slab, shared Blair latrine Other (specify) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 4 5 6 7 8 9 99 66	

305	What is the main source of drinking water for your household?	Pond Hand dug well Shallow tube well Borehole Berkad River, stream, dam Rain water harvesting Water trucked to settlements without permanent water source Other (specify) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 4 5 6 7 8 9 99 66	
306	How long does it take you to fetch water for household use/How many MINUTES does it take to go to the water source, get water, and come back (include waiting time)? [Note - if water source is in compound, record 0 minutes]	[Integer] I don't know / Unsure I prefer not to answer/ no answer	 99 66	
307	What is the main source of cooking fuel?	Mainly firewood (purchased or collected), animal dung or other Crop residue Charcoal, kerosene, butane gas, electricity or does not cook Other (specify) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 4 99 66	
308	Does the household currently own any radios?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	
309	Does the household currently own any mattresses and/or beds?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	

Module 4: Shock Exposure and Coping

Note: Thank you for your answers so far. Now I would like to ask about different shocks and disasters and how you deal with them.

Question		Responses/Coding		Skip
401	During the last twelve (12) months/one (1) year, did your household experience any drought?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	⇒401a ⇒402 ⇒402 ⇒402
a.	How severe was the impact on your income and food consumption?	No impact (none) Slight impact Moderate impact Strong impact Worst ever happened I don't know / Unsure I prefer not to answer/ no answer	1 2 3 4 5 99 66	
b.	To what extent were you and your household able to recover (by recover we mean how well or poorly you were able to return to your normal life after the drought)?	Did not recover Recovered some, but worse off than before event Recovered to same level as before event Recovered and better off than before event Not affected by event I don't know / Unsure I prefer not to answer/ no answer	1 2 3 4 5 99 66	

402	During the last twelve (12) months/one (1) year, did your household experience any other significant shock or stress? (Not including drought) [Select all that apply]	None Conflict/violence Crop disease and/or pest Flood Food price increase Livestock disease or epidemic Human disease or epidemic Displacement of people from or into your community Illness of a household member Death of a wage earner Death or illness of someone outside the household Sudden loss of outside income Unexpected expense Sudden loss of aid Loss of livestock due to theft Loss of livestock due to death Other (specify) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 99 66	⇒ 403
a.	How many times did you experience this/these shock(s) or stress(es) in the last twelve (12) months?	[Integer] I don't know / Unsure I prefer not to answer/ no answer	 99 66	
b.	How severe was the impact on your income and food consumption?	No impact (none) Slight impact Moderate impact Strong impact Worst ever happened I don't know / Unsure I prefer not to answer/ no answer	1 2 3 4 5 99 66	
c.	To what extent were you and your household able to recover (by recover we mean how well or poorly you were able to return to your normal life after the shock)?	Did not recover Recovered some, but worse off than before event Recovered to same level as before event Recovered and better off than before event Not affected by event I don't know / Unsure I prefer not to answer/ no answer	1 2 3 4 5 99 66	
403	As a result of the stressful event you experienced in the last year, were you at any point forced to: [Select all that apply]	Send livestock in search of pasture Sell livestock Slaughter livestock Lease out land Temporarily migrate Permanently migrate Send children or an adult to stay with relatives Take children out of school Reduce food consumption Take up new wage labour Engage in charcoal production Engage in firewood sales Sell household items (e.g. radio, bed) Sell any assets that you or your household used to earn an income/provide for basic needs Take a loan from a Savings Group/VSLA Take a loan from another source Receive money or food from family members within the community Receive food aid or assistance from the government (including food/cash for work) Receive food aid or assistance from an NGO (including food/cash for work) Use money from savings Get money from a relative from outside the village but inside Somalia/Somaliland (remittances) Get money from a relative in another country/abroad (remittances) Receive help from local organizations/ companies	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23	

Module 5: Access to Select Markets, Information and Services

Note: Thank you for your answers so far. Now I would like to ask about services and support in your area.

	Question	Responses/Coding		Skip
501	Where is the market you usually go to for accessing household goods and/or services?	This village Another village nearby Local market Regional market Other (specify) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 4 5 99 66	
a.	How do you access the market?	By foot or bicycle By car/taxi By bus I don't know / Unsure I prefer not to answer/ no answer	1 2 3 99 66	
b.	How many minutes (one way) does it take you to reach the market where you normally access household goods and/ or services?	[Integer] I don't know / Unsure I prefer not to answer/ no answer	 99 66	
502	Do you communicate/talk regularly with at least one person outside the village?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	
503	Are Community Animal Health Worker (CAHW) services available to members of your community?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	
a.	How many minutes does it take you to reach (in one direction) the nearest Community Animal Health Worker (CAHW)? (Write 0 if they do not use or need CAHWs)	[Integer] Do not use/need CAHWs I don't know / Unsure I prefer not to answer/ no answer	 0 99 66	⇒ 503b ⇒ 504
b.	How do you access the CAHWs?	By foot or bicycle By car/taxi By bus I don't know / Unsure I prefer not to answer/ no answer	1 2 3 99 66	
c.	Have you or anyone in your household faced problems within the last year in accessing CAHW services when you needed it?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	⇒ 504c ⇒ 504d ⇒ 504d ⇒ 504d
d.	Why were you or they not able to access the service?	Lack of money to pay for service There was no (or not adequate) staff to provide the service Service is too far away There was no transportation There is no road/road condition was poor No (or not adequate) supplies at service location Quality of the service was very poor Other (specify) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 4 5 6 7 8 99 66	
e.	How well does the service meet your needs?	It does not help (does not make our life better) It helps a little (makes our lives a little better) It helps a good amount (makes our lives better) It helps a lot (makes our lives much better) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 4 99 66	
504	Did you receive any information on early warning for natural hazards (floods, droughts, etc.) in the last year?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	⇒ 504a ⇒ 505 ⇒ 505 ⇒ 505

a.	Who was the main provider of the information about this topic?	Rural development agents Clan/traditional leaders Religious leaders Neighbours or friends Government offices Family members Community group NGO (local or international) Other (specify) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 4 5 6 7 8 9 99 66	
b.	How did the information influence your household or livelihood decisions?	No decisions made based on the information Decision benefited the HH Decision was detrimental to the HH Decision had no effect I don't know / Unsure I prefer not to answer/ no answer	1 2 3 4 99 66	
505	During the recent drought, did you or anyone in your household receive support from a Savings Group or a member of a Savings Group?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	⇒ 505a ⇒ M6
a.	What types of support your household received from a Savings Group or a member of a Savings Group in the past 12 months?	Zakat Remittances Gifts (donation of cash/animals) Loans (cash, labor, seeds, animals) Shared water and/or food Provided shelter Sadaqa Other (specify) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 4 5 6 7 8 99 66	
506	How many times in the past year has someone from the local government visited your community and met with community members (not just a social visit)?	[Integer] I don't know / Unsure I prefer not to answer/ no answer	 99 66	

Module 6: Project Participation

Note: Thank you for your answers so far. Now I would like to ask about the activities that you have participated in.

Question		Responses/Coding		Skip
601	Do Cash for Work (CfW) activities take place in your community?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	➡ 601a ⇒ 602 ⇒ 602 ⇒ 602
a.	Do you or does anyone in the household participate in the activity?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	➡ 601b ⇒ 602 ⇒ 602 ⇒ 602
b.	How well is the CfW activity meeting participant needs?	It does not help (does not make our life better) It helps a little (makes our lives a little better) It helps a good amount (makes our lives better) It helps a lot (makes our lives much better) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 4 99 66	
602	Is there an Early Action/Early Warning Committee or Community-based Disaster Risk Management (CBDRM) system in your community (by this we mean a committee or a group that makes plans for disaster risk management or response or communicates early information about risks like drought so people can take action)?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	➡ 602a ⇒ 603 ⇒ 603 ⇒ 603

a.	Do you or does anyone in the household participate in this committee or group?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	➡ 602b ⇒ 603 ⇒ 603 ⇒ 603
b.	How well is the committee's or group's activities meeting participant needs?	It does not help (does not make our life better) It helps a little (makes our lives a little better) It helps a good amount (makes our lives better) It helps a lot (makes our lives much better) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 4 99 66	
c.	Is the government (district or local) involved in the Early Warning/Early action activities in your community?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	
603	Is there a Drought Committee in your community (by Drought Committee we mean a group organized by the government, local community or an NGO to mobilize the community to respond to the drought)?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	➡ 603a ⇒ 604 ⇒ 604 ⇒ 604
a.	Do you or does anyone in the household participate in the committee?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	➡ 603b ⇒ 604 ⇒ 604 ⇒ 604
b.	How well are the committee's activities meeting participant needs?	It does not help (does not make our life better) It helps a little (makes our lives a little better) It helps a good amount (makes our lives better) It helps a lot (makes our lives much better) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 4 99 66	
604	Have there been any water asset activities in your community (rehabilitation or installation)?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	⇒ 604a ⇒ 605 ⇒ 605 ⇒ 605
a.	Do you or does anyone in the household benefit from the activity?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	⇒ 604b ⇒ 605 ⇒ 605 ⇒ 605
b.	Do you participate in managing the water asset (through Water Management Committee for example)?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	
c.	How well is the activity meeting participant needs?	It does not help (does not make our life better) It helps a little (makes our lives a little better) It helps a good amount (makes our lives better) It helps a lot (makes our lives much better) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 4 99 66	
605	Is there a savings group/VSLA in your community?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	⇒ 605b ⇒ M7
a.	Do you or does anyone in the household benefit from the group's (savings group/ VSLA) activities?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	⇒ 605b ⇒ M7
b.	How well is the activity (savings group/ VSLA) meeting participant needs?	It does not help (does not make our life better) It helps a little (makes our lives a little better) It helps a good amount (makes our lives better) It helps a lot (makes our lives much better) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 4 99 66	

Module 7: Dietary Diversity and Food Consumption

Thank you for your answers so far. We have reached the last part of the survey, in this part I would like to ask about food security. For the first questions, 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 and how many days in last 7 days. Please include all food eaten both at your home or away from home or outside of your home.

Question		Responses/Coding		Skip
701	How many days in the last seven (7) days has this household eaten any food made from grains, such as sadza, rice, posho, porridge, bread, chapatti, pasta/macaroni, noodles or other foods made from maize, millet, sorghum or other grains such as mandazi, doughnut, pancakes, etc.?	[INTEGER] I don't know / Unsure I prefer not to answer/ no answer	 99 66	
702	How many days in the last seven (7) days has this household eaten any cassava, yams, sweet potatoes, Irish potatoes or other roots and tubers?	[INTEGER] I don't know / Unsure I prefer not to answer/ no answer	 99 66	
703	How many days in the last seven (7) days has this household eaten any food made with vegetables such as onions, cabbage, green leafy vegetables, gathered wild green leaves, tomato, cucumber, pumpkin, mushroom, kale, leak, green pepper, beet root, garlic, or carrots?	[INTEGER] I don't know / Unsure I prefer not to answer/ no answer	 99 66	
704	How many days in the last seven (7) days has this household eaten any food made from beans (white, brown, horse), peas, lentils, chick peas, rape seed, linseed, sesame, sunflower, soybean flour or nuts (groundnuts, groundnut flour)?	[INTEGER] I don't know / Unsure I prefer not to answer/ no answer	 99 66	
705	How many days in the last seven (7) days has this household eaten any food or fruit juices made from fruits such as mango, banana, oranges, pineapple, papaya, guava, avocado, wild fruit, or apple?	[INTEGER] I don't know / Unsure I prefer not to answer/ no answer	 99 66	
706	How many days in the last seven (7) days has this household eaten any food made from beef, lamb, goat, wild game, chicken, or other birds, other meats?	[INTEGER] I don't know / Unsure I prefer not to answer/ no answer	 99 66	
707	How many days in the last seven (7) days has this household eaten any eggs?	[INTEGER] I don't know / Unsure I prefer not to answer/ no answer	 99 66	
708	How many days in the last seven (7) days has this household eaten any fresh fish, smoked fish, fish soup/sauce or dried fish or shellfish?	[INTEGER] I don't know / Unsure I prefer not to answer/ no answer	 99 66	
709	How many days in the last seven (7) days has this household eaten any cheese, yogurt, milk, powder milk, buttermilk or other milk products?	[INTEGER] I don't know / Unsure I prefer not to answer/ no answer	 99 66	
710	How many days in the last seven (7) days has this household eaten any sugar, sugar cane, or honey?	[INTEGER] I don't know / Unsure I prefer not to answer/ no answer	 99 66	
711	How many days in the last seven (7) days has this household eaten any foods made with oil, margarine, fat or butter?	[INTEGER] I don't know / Unsure I prefer not to answer/ no answer	 99 66	
712	How many days in the last seven (7) days has this household eaten any other foods, such as condiments, coffee or tea?	[INTEGER] I don't know / Unsure I prefer not to answer/ no answer	 99 66	

Module 8: Household Hunger (HFIAS and HHS)

Question		Responses/Coding		Skip
801	In the past four weeks [30 days], did you worry that your household would not have enough food?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	⇒ 801a ⇒ 802
a.	How often did this happen in the past 4 weeks [30 days]?	Rarely (once or twice in the past four weeks) Sometimes (three to ten times in the past four weeks) Often (more than ten times in the past four weeks) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 99 66	
802	In the past four weeks [30 days], were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	⇒ 802a ⇒ 803
a.	How often did this happen in the past 4 weeks [30 days]?	Rarely (once or twice in the past four weeks) Sometimes (three to ten times in the past four weeks) Often (more than ten times in the past four weeks) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 99 66	
803	In the past four weeks [30 days], did you or any household member have to eat a limited variety of foods due to a lack of resources?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	⇒ 803a ⇒ 804
a.	How often did this happen in the past 4 weeks [30 days]?	Rarely (once or twice in the past four weeks) Sometimes (three to ten times in the past four weeks) Often (more than ten times in the past four weeks) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 99 66	
804	In the past four weeks [30 days], did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	⇒ 804a ⇒ 805
a.	How often did this happen in the past 4 weeks [30 days]?	Rarely (once or twice in the past four weeks) Sometimes (three to ten times in the past four weeks) Often (more than ten times in the past four weeks) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 99 66	
805	In the past four weeks [30 days], did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	⇒ 805a ⇒ 806
a.	How often did this happen in the past 4 weeks [30 days]?	Rarely (once or twice in the past four weeks) Sometimes (three to ten times in the past four weeks) Often (more than ten times in the past four weeks) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 99 66	
806	In the past four weeks [30 days], did you or any other household member have to eat fewer meals in a day because there was not enough food?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	⇒ 806a ⇒ 807

a.	How often did this happen in the past 4 weeks [30 days]?	Rarely (once or twice in the past four weeks) Sometimes (three to ten times in the past four weeks) Often (more than ten times in the past four weeks) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 99 66	
807	In the past four weeks [30 days], was there ever no food to eat of any kind in your household because of lack of resources to get food?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	⇒ 807a ⇒ 808
a.	How often did this happen in the past 4 weeks [30 days]?	Rarely (once or twice in the past four weeks) Sometimes (three to ten times in the past four weeks) Often (more than ten times in the past four weeks) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 99 66	
808	In the past four weeks [30 days], did you or any household member go to sleep at night hungry because there was not enough food?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	⇒ 808a ⇒ 809
a.	How often did this happen in the past 4 weeks [30 days]?	Rarely (once or twice in the past four weeks) Sometimes (three to ten times in the past four weeks) Often (more than ten times in the past four weeks) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 99 66	
809	In the past four weeks [30 days], did you or any household member go a whole day and night without eating anything because there was not enough food?	Yes No I don't know / Unsure I prefer not to answer/ no answer	1 2 99 66	⇒ 809a ⇒ M9
a.	How often did this happen in the past 4 weeks [30 days]?	Rarely (once or twice in the past four weeks) Sometimes (three to ten times in the past four weeks) Often (more than ten times in the past four weeks) I don't know / Unsure I prefer not to answer/ no answer	1 2 3 99 66	

Module 9: Reduced Coping Strategies Index (rCSI)

Question		Responses/Coding		Skip
In the past seven (7) days, if there have been times when you did not have enough food or money to buy food, how often has your household had to:				
901	Borrow food, or rely on help from a friend or relative?	[INTEGER 0 – 7] I don't know / Unsure I prefer not to answer/ no answer	 99 66	
902	Rely on less preferred and less expensive foods?	[INTEGER 0 – 7] I don't know / Unsure I prefer not to answer/ no answer	 99 66	
903	Limit portion size at mealtimes?	[INTEGER 0 – 7] I don't know / Unsure I prefer not to answer/ no answer	 99 66	
904	Restrict/reduce consumption by adults so children can eat more?	[INTEGER 0 – 7] I don't know / Unsure I prefer not to answer/ no answer	 99 66	
905	Reduce number of meals eaten in a day?	[INTEGER 0 – 7] I don't know / Unsure I prefer not to answer/ no answer	 99 66	

Module 10: Closing

This concludes our survey, thank you kindly for your participation in this household survey. The information you have provided will be used to monitor and measure resilience, livelihood and food security in Somalia and Somaliland. Your participation in this survey is highly appreciated.

Thank you.

Annex 4: Food Security Indicators and Calculations

The outcome indicators of food security were defined as the following:

- Food Consumption Score (FCS)
- Food Consumption Groups (FCGs)
- Household Hunger Scale (HHS)
- Household Food Insecurity Access Scale (HFIAS)
- Household Food Insecurity Access Prevalence (HFIAP)
- Reduced Coping Strategies Index (rCSI)
- Reduced Coping Strategies Index Groups (rCSI groups)
- Recovery from Drought

Food Consumption Score (FCS) and Food Consumption Groups (FCGs)

The FCS is a composite score combining dietary diversity and consumption frequency questions together with relative nutritional importance (WFP, 2008). Diversity is measured via the number of different types of food or food groups consumed over the last seven (7) days, which are all weighted based on an interpretation of nutrient density, and frequency is considered by the number of days of consumption of each food or food group over the period of interest (WFP, 2008).

As the described in the Technical Guidance Sheet for the Food Consumption Analysis (2008), when FCS is part of a more comprehensive food security assessment, it is calculated using the reported consumption frequency of food items and summing the frequency per specific food group (there are nine (9): main staples, pulses, vegetables, fruit, meat and fish, milk, sugar, oil, and condiments). This information is generated through a food consumption module that asks about the number of days 10 to 25 different food items are consumed as well as the primary and secondary source of the food item. However, when the inclusion of this module or the required calculation steps are not possible, pre-existing work, analyst judgment or local knowledge can be used to create the food consumption groups and their values. In this research, pre-existing food consumption group data is utilized to calculate the corresponding value. This is then combined with the pre-determined weight of the food group to generate a new weighted score for each of the nine (9) food groups. The standard weights for each are below.

Table 28: Food Group and Weight Applied

No.	Food group	Weight
1	Cereals or main staples	2
2	Pulses and nuts	3
3	Vegetables	1
4	Fruits	1
5	Meat and fish	4
6	Dairy products	4
7	Sugars	0.5
8	Oils	0.5
9	Condiments	0

The FCS module in the quantitative survey asks how many days in the last seven (7) days has the household eaten:

- Any food made from grains, such as sadza, rice, posho, porridge, bread, chapatti, pasta/macaroni, noodles or other foods made from maize, millet, sorghum or other grains such as mandazi, doughnut, pancakes, etc.? (Staples group)
- Any cassava, yams, sweet potatoes, Irish potatoes or other roots and tubers? (Staples group)
- Any food made with vegetables such as onions, cabbage, green leafy vegetables, gathered wild green leaves, tomato, cucumber, pumpkin, mushroom, kale, leak, green pepper, beet root, garlic, or carrots? (Vegetables group)
- Any food made from beans (white, brown, horse), peas, lentils, chick peas, rape seed, linseed, sesame, sunflower, soybean flour or nuts (groundnuts, groundnut flour)? (Pulses group)
- Any food or fruit juices made from fruits such as mango, banana, oranges, pineapple, papaya, guava, avocado, wild fruit, or apple? (Fruit group)
- Any food made from beef, lamb, goat, wild game, chicken, or other birds, other meats? (Meat and fish group)
- Any eggs? (Meat and fish group)
- Any fresh fish, smoked fish, fish soup/sauce or dried fish or shellfish? (Meat and fish group)
- Any cheese, yogurt, milk, powder milk, buttermilk or other milk products? (Dairy group)
- Any sugar, sugar cane, or honey? (Sugar group)
- Any foods made with oil, margarine, fat or butter? (Oil group)
- Any other foods, such as condiments, coffee or tea? (Condiments group)

After the numerical FCS is calculated, it is converted into a categorical variable based on the categories identified below, called Food Consumption Groups (FCGs).[15]

Table 29: Food Consumption Categorization

Category	FCS
Poor	1 - 28
Borderline	28.5 - 42
Acceptable	> 42

An individual with the most diverse and best consumption will have an FCS of 112, meaning they have eaten from all the food groups each of the seven (7) days prior to the assessment. Generally, an acceptable score indicates that the respondent has eaten staples every day and vegetables almost every day, consumed sugar and fat on several days and may have eaten either some animal protein or pulses several days along with fruits and milk. Someone with poor food consumption is assumed to have eaten staples each day, but groups such as vegetables, sugars and oils with less frequency. They are not expected to have eaten animal proteins at all.

In the original analysis of this data, the FCS calculation contained an error, which swapped the weight of the vegetable and pulses food groups. This was corrected for this report. However, the impact on the calculated prevalence of poor/borderline, and acceptable food consumption was small.

Household Hunger Scale (HHS)

HHS is a measure of household food deprivation developed from the Household Food Insecurity Access Scale (HFIAS) that serves as a proxy for food access. Both scales ask respondents to report on their experience with hunger within the past 30 days or 4 weeks using a combination of occurrence and frequency-of-occurrence questions. According to Ballard et al. (2011), HHS is best suited to use in situations of substantial food insecurity and is designed to be used to compare across cultures and countries.

HHS uses the three (3) questions from HFIAS that correspond with the most severe forms of food insecurity (Ballard et al 2011.).

[15] The categories for FCS have been also identified as poor being from one (1) to 21, borderline as 21.5 to 35 and acceptable as over 35. However, the guidance on scoring WFP produced in 2012 identifies the thresholds as they are presented here and were the categories utilized in the analysis for this study.

Table 30: HFIAS Food Insecurity Questions

	Question	Response options and score	
1	In the past 30 days, was there ever no food of any kind to eat in your house because of lack of resources to get food?	Rarely (1-2 times) Sometimes (3-10 times) Often (more than 10 times)	0 1 2
2	In the past 30 days, did you or any household member go to sleep at night hungry because there was not enough food?	Rarely (1-2 times) Sometimes (3-10 times) Often (more than 10 times)	0 1 2
3	In the past 30 days did you or any household member go a whole day and night without eating anything at all because there was not enough food?	Rarely (1-2 times) Sometimes (3-10 times) Often (more than 10 times)	0 1 2

The HHS score is a combination of the responses to these questions, with scores ranging from zero (0) to six (6). The continuous values and then transformed into categorical variables based on the following thresholds:

- None or light hunger (0 to 1),
- Moderate hunger (2 to 3), and
- Severe hunger (4 to 6).

As opposed to FCS, a higher HHS score is generally thought to identify more extreme hunger. It should be noted that because the quantitative survey was designed to assess both the HFIAS and HHS scores of respondents, the questions for HHS were constructed according to recommendations for HFIAS, as discussed below, in which the question first addresses the occurrence of a specific condition and then proceeds, as relevant, to assess the frequency of occurrence.

Household Food Insecurity Access Scale (HFIAS) and Prevalence (HFIAP)

The HFIAS is structured in line with the HHS questions but includes a total of nine (9) questions that address respondent experiences with various levels of food insecurity. The questions as included in the quantitative survey are in the table below. If respondents have not experienced a condition (the occurrence portion of the question), the frequency-of-occurrence sub-question is skipped and the module moves to the next occurrence question.

Table 31: HFIAS and HFIAP Food Insecurity Questions

1.	In the past four weeks [30 days], did you worry that your household would not have enough food?	Yes No I don't know / Unsure I prefer not to answer/ no answer
1a.	How often did this happen in the past 4 weeks [30 days]?	Rarely (once or twice) Sometimes (three to ten times) Often (more than ten times) I don't know / Unsure I prefer not to answer/ no answer
2.	In the past four weeks [30 days], were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?	Yes No I don't know / Unsure I prefer not to answer/ no answer
2a.	How often did this happen in the past 4 weeks [30 days]?	Rarely (once or twice) Sometimes (three to ten times) Often (more than ten times) I don't know / Unsure I prefer not to answer/ no answer
3.	In the past four weeks [30 days], did you or any household member have to eat a limited variety of foods due to a lack of resources?	Yes No I don't know / Unsure I prefer not to answer/ no answer
3a.	How often did this happen in the past 4 weeks [30 days]?	Rarely (once or twice) Sometimes (three to ten times) Often (more than ten times) I don't know / Unsure I prefer not to answer/ no answer

4.	In the past four weeks [30 days], did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?	Yes No I don't know / Unsure I prefer not to answer/ no answer
4a.	How often did this happen in the past 4 weeks [30 days]?	Rarely (once or twice) Sometimes (three to ten times) Often (more than ten times) I don't know / Unsure I prefer not to answer/ no answer
5.	In the past four weeks [30 days], did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?	Yes No I don't know / Unsure I prefer not to answer/ no answer
5a.	How often did this happen in the past 4 weeks [30 days]?	Rarely (once or twice) Sometimes (three to ten times) Often (more than ten times) I don't know / Unsure I prefer not to answer/ no answer
6.	In the past four weeks [30 days], did you or any other household member have to eat fewer meals in a day because there was not enough food?	Yes No I don't know / Unsure I prefer not to answer/ no answer
6a.	How often did this happen in the past 4 weeks [30 days]?	Rarely (once or twice) Sometimes (three to ten times) Often (more than ten times) I don't know / Unsure I prefer not to answer/ no answer
7	In the past four weeks [30 days], was there ever no food to eat of any kind in your household because of lack of resources to get food?	Yes No I don't know / Unsure I prefer not to answer/ no answer
7a.	How often did this happen in the past 4 weeks [30 days]?	Rarely (once or twice) Sometimes (three to ten times) Often (more than ten times) I don't know / Unsure I prefer not to answer/ no answer
8.	In the past four weeks [30 days], did you or any household member go to sleep at night hungry because there was not enough food?	Yes No I don't know / Unsure I prefer not to answer/ no answer
8a.	How often did this happen in the past 4 weeks [30 days]?	Rarely (once or twice) Sometimes (three to ten times) Often (more than ten times) I don't know / Unsure I prefer not to answer/ no answer
9.	In the past four weeks [30 days], did you or any household member go a whole day and night without eating anything because there was not enough food?	Yes No I don't know / Unsure I prefer not to answer/ no answer
9a.	How often did this happen in the past 4 weeks [30 days]?	Rarely (once or twice) Sometimes (three to ten times) Often (more than ten times) I don't know / Unsure I prefer not to answer/ no answer

Coates, Swindale and Bilinsky (2007) state that the HFIAS questions are presented in order of the severity of the food insecurity (access), with the latter questions associated with more extreme food insecurity. Additionally, the occurrence questions address the food insecurity access domains of:

- "Anxiety and uncertainty about the household food supply…
- Insufficient Quality (includes variety and preferences of the type of food)…
- Insufficient food intakes and its physical consequences… (Ibid., pg. 6)."

For the HFIAS, the response of 'no' to the occurrence question is coded as zero (0), 'rarely' is coded as one (1), 'sometimes' as two (2), and 'often' as two (3). These scores are then summed to create the overall HFIAS numerical measurement. Scores range from zero (0) to 27, with higher scores indicating increased food insecurity access.

HFIAS scores are not easily converted to categorical variables but the individual variable scores can be used to calculate Household Food Insecurity Access Prevalence (HFIAP), which categorizes households into the classifications of food secure, mildly food insecure, moderately food insecure and severely food insecure, based on the frequency and occurrence of events experienced as they move towards more severe conditions. The table

below is developed from the guidance presented in Coates, Swindale and Bilinsky (2007, pgs. 19-21).

Table 32: HFIA Categorization Guidance

HFIA category	Calculation	Description
Food secure	Q1a= 0 or Q1a= 1, and Q2= 0, and Q3= 0, and Q4= 0, and Q5= 0, and Q6= 0, and Q7= 0, and Q8= 0, and Q9= 0	Experiences none of the food insecurity access conditions, or rarely experiences just worry (Q1)
Mildly food insecure access	Q1a= 2 or Q1a= 3 or Q2a= 1 or Q2a= 2 or Q2a= 3 or Q3a= 1 or Q4a= 1, and Q5= 0, and Q6= 0, and Q7= 0, and Q8= 0, and Q9= 0	Worries sometimes or often about having access to sufficient food, being able to eat preferred foods, eats a more monotonous diet than desired (and/or rarely eats some undesirable food). However, does not reduce the quantity of food eaten and does not experience the most severe food insecurity access conditions.
Moderately food insecure access	Q3a= 2 or Q3a= 3 or Q4a= 2 or Q4a= 3 or Q5a= 1 or Q5a= 2 or Q6a= 1 or Q6a= 2, and Q7= 0, and Q8= 0, and Q9= 0	Reduces the quality of food more often or sometimes or often eats undesirable foods, and additionally rarely or sometimes reduces the quantity of food. However, still does not experience the most severe food insecurity access conditions.
Severely food insecure access	Q5a= 3 or Q6a= 3 or Q7a= 1 or Q7a= 2 or Q7a= 3 or Q8a= 1 or Q8a= 2 or Q8a= 3 or Q9a= 1 or Q9a= 2 or Q9a= 3	Often reduces quantity of food and experiences at least one (1) of the most severe food insecurity access conditions, even if rarely.

Using these categories, HFIA Prevalence is then calculated by determining the percentage of all respondent households that fall into each of the four (4) categories.

Reduced Coping Strategy Index (rCSI) and rCSI Groups

The rCSI is a subset of the Coping Strategies Index (CSI) with five (5) particular coping behaviors, each assigned a universal severity weighting so that scores can be compared across contexts (Maxwell and Caldwell, 2008). Like the CSI, the rCSI asks a series of questions about the behaviors a household employs to cope with food insecurity. Respondents are asked to report the number of times within the past seven (7) days they have employed the coping strategies in response to inadequate food or a lack of resources to purchase food. A heightened rCSI score corresponds with increased reliance on extreme coping measures to deal with food insecurity.

To measure rCSI, households are asked about how often they used the set of five (5) short-term food based coping strategies in situations in which they did not have enough food, or money to buy food, during the seven (7) days prior to the assessment. Each of the strategies is assigned a standard weight based on its severity. Household rCSI scores determined by multiplying the number of days in the past week each strategy was employed by its corresponding severity weight, and then summing the totals. The table below indicates the severity weight assigned to each strategy.

Table 33: Reduced Coping Strategies Index Weighting

Coping Strategy	Universal Severity Weight
1. Rely on less preferred and less expensive foods	1
2. Borrow food or rely on help from friends or relatives	2
3. Limit portion size at mealtime	1
4. Restrict consumption by adults in order for small children to eat	3
5. Reduce number of meals eaten in a day	1

There are no universal thresholds for rCSI, but the higher the score, the more severe the coping applied by a household. Based on the country context, the total rCSI score is classified into three (3) categories for this research, referred to as rCSI groups:

- No or low coping (0 to 3),
- Medium coping (4 to 9), and
- High coping (≥10).

In the original analysis, the first two coping strategies were erroneously switched in the dataset, and so the wrong weights were used for these two questions when calculating the rCSI. This was corrected for the additional analysis in this report. However, the overall impact on the score was generally found to be small.

Recovery from Drought

Households were asked if their income and food consumption had been impacted by drought in the past year. Nearly all (98%) of households reported that they had been impacted by drought. These households were then asked to what extent they had recovered from these impacts. Reponses were:

- 1= did not recover
- 2= recovered some, but worse off than before event
- 3= recovered to the same level as before
- 4= recovered and better off than before event

This indicator is related to resilience to food insecurity and was used as an outcome indicator in some analyses.

Additional information on these indicators can be accessed via the corresponding resources identified in the references section of the report.

Mosaic Plots Showing Correlations among the Food Security and Coping Variables

Mosaic plots are visual representations of the associations among categorical variables, in this case, the three different food security indicators. The colored bars represent food security status: green is acceptable Food Consumption (FC), yellow reflects borderline FC, and red reflects poor FC. These plots, in which the area of each tile represents the proportion of total observations in the corresponding group, show that the percent of the sample with high coping is very high (far left column). The proportion of the sample with poor food consumption (three red bars from left to right) is much lower.

The tiles of the graphs represent the relative cell frequencies of contingency tables. The first mosaic plot shows that while there is overlap between the FCS and the rCSI, the overlap is not great. Among those households with high coping, nearly half of them have acceptable or borderline FC. Similarly, among households with low coping, more than a third of these have borderline or poor FC.

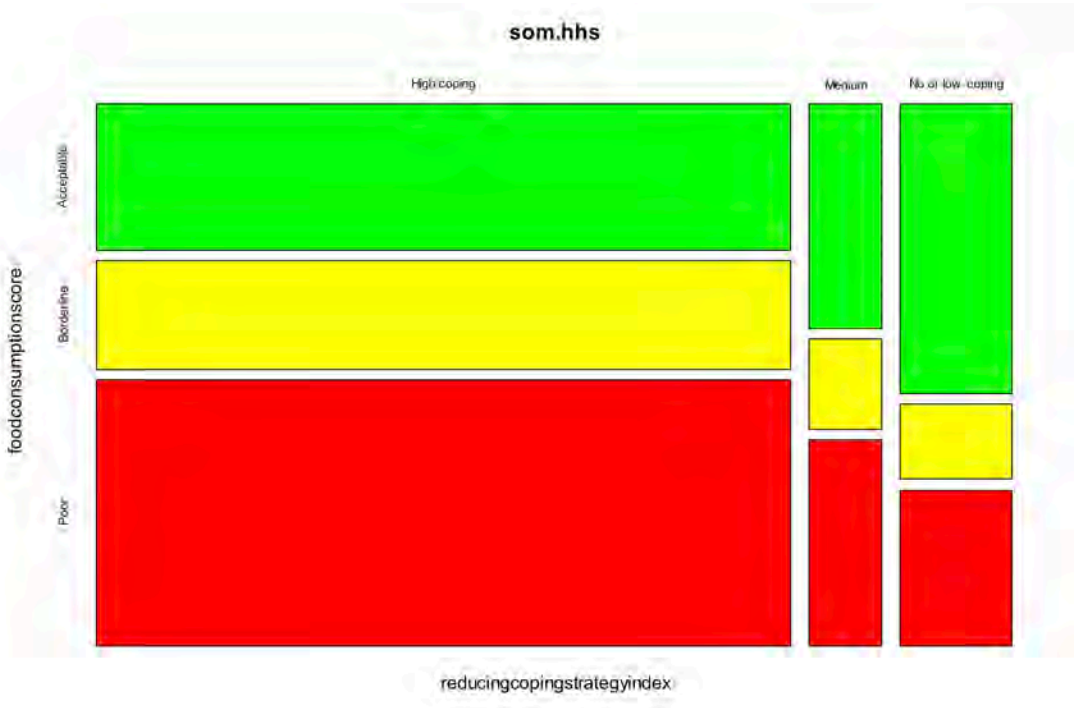

Figure 3: Pairwise Relationship between FCS and rCSI

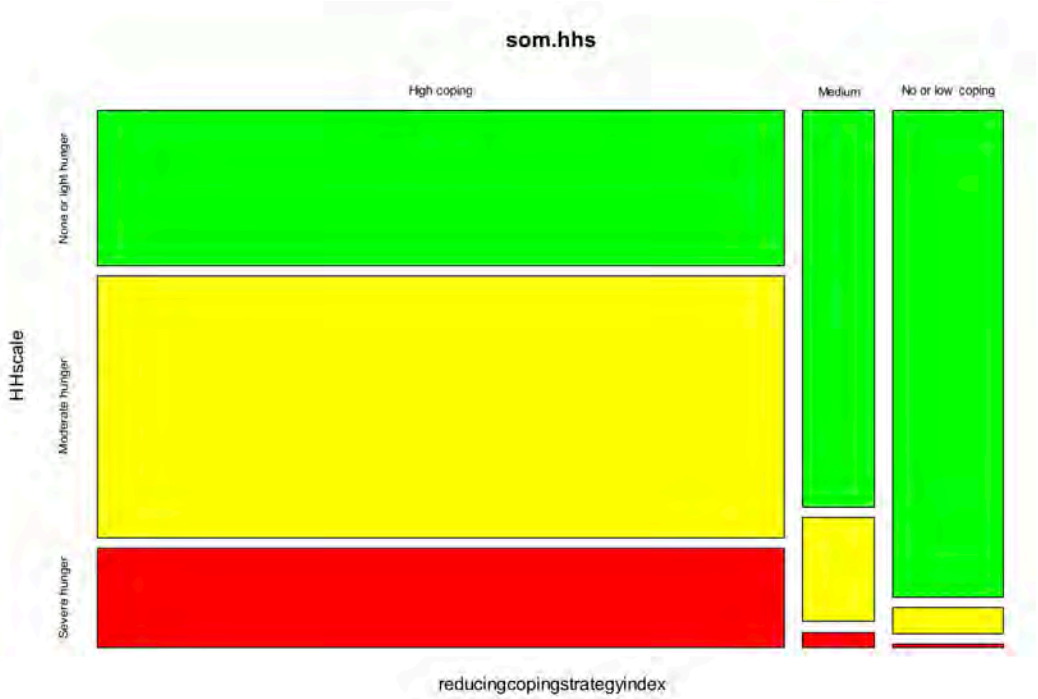

Figure 4: Pairwise Relationship between HHS and rCSII

The relationship between the HHS and rCSI is stronger but there is still not high agreement between the two measures. Among those with high coping, which represents a large proportion of this sample, nearly one quarter have no or little hunger. However, there is much better agreement among those with low coping. Nearly all of these households were considered to have little or no hunger.

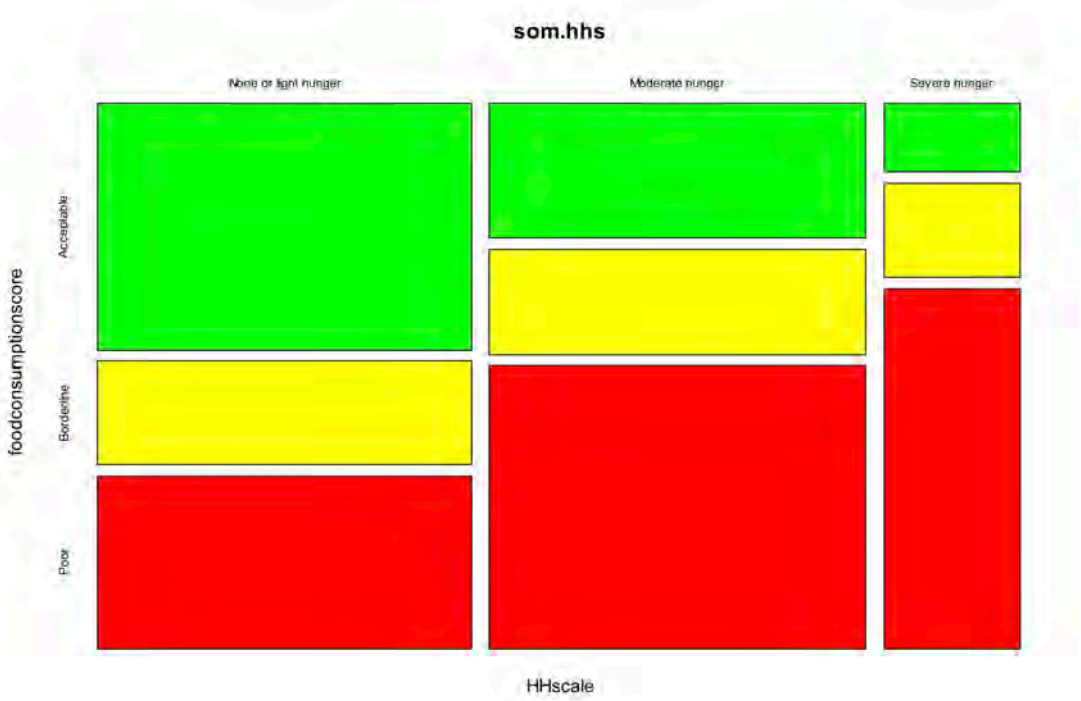

Figure 5: Pairwise Relationship between FCS and HHS

The household hunger score also correlates with the FCS, but there are a substantial number of households with poor FCS in all hunger groups and there are nearly one-third of households among those considered to have severe hunger (far right column) that have acceptable or borderline FCS.

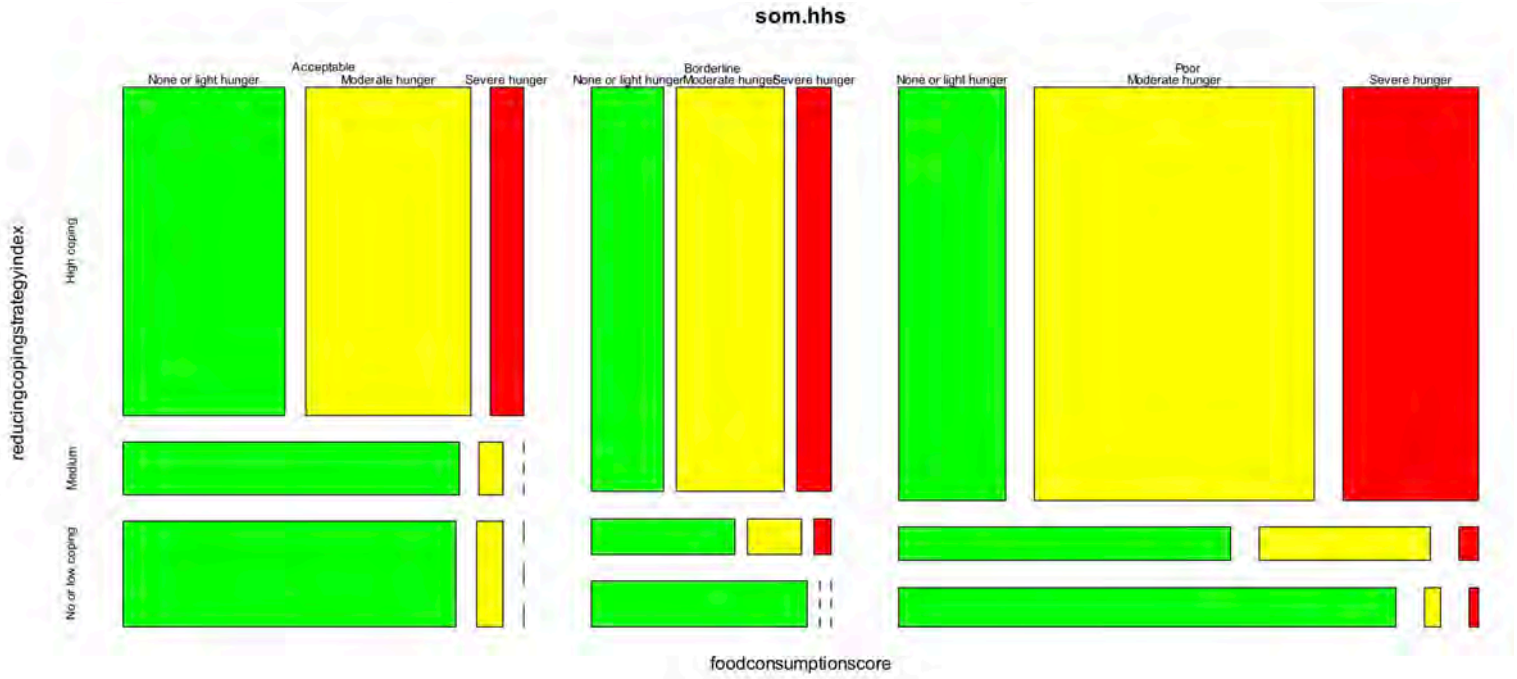

Figure 6: Three-way Relationship between rCSI, FCS and HHS

The three way plot above shows how the three variables relate to each other. Here green, yellow and red reflect the categories of household hunger (green to red means less to more hunger); however, the three sets of bars reflect the three categories of FC. The far left set of bars reflects the adequate food consumption group; the middle set of bars represent borderline food consumption and the far right set of bars reflects poor FC. High coping is commonly found in the adequate consumption group as is moderate and severe hunger. Among those with poor FC, the majority are categorized as having moderate hunger. From these plots we conclude that the perception based indicators overlap more than do the perception indicators with the FC.

While we analyze all of these indicator sas possible outcome measures, the FCS more consistently relates to potential determinants of food security. Therefore, many of our multivariable analyses utilize the FCS or a binary version of FC, “secure” or “not secure”, in the final models.

Annex 5: Data Analysis and Statistical Methods

Data Cleaning and Analysis

Data cleaning and analysis was conducted using SPSS V22, STATA V13, and R 3.4.1.

Initial data cleaning was done by the Forcier Consulting analysts. Further data cleaning was done as part of this analysis to verify and correct certain key indicators, and to construct additional household and community level indicators. Questions of interest for the analysis with extensive 'other' responses had text records of these responses. The translations of these were obtained from World Vision, and the analysts re-coded these answers into quantifiable variables. This was most important for the main and secondary income source questions, which had 342 un-coded 'other' answers (223 primary, 119 secondary). Additionally, information from the community database were consolidated and merged into the household database to provide additional information on programmes present in the communities where the surveyed households lived.

The data and sampling methodology were reviewed to assess whether sampling probability weights were needed in analysis. The incomplete sampling frame, as well as the bias that may be introduced by the use of cell phones for data collection led to the decision not to introduce probability weights. As such, this data should not be considered statistically representative of the populations surveyed, though they are considered indicative.

Statistical Tests and Procedures

A number of statistical tests are used throughout this analysis.

Tabulated proportions and means

First, when prevalences are tabulated comparing different strata, the column proportions are compared using a chi-squared test of independence. When multiple comparisons are made, the Bonferroni correction was used to adjust p-values. Significant differences ($p<0.05$) were indicated in these tables by labelling the columns with letters (A, B, etc.) and the higher prevalence value cell has the letters of the columns that is significantly differs from.

Additionally, in some cases, tabulated mean values are compared in the same way. This uses t-tests to compare column means, also using the Bonferroni correction to adjust the p-values when multiple comparisons are made. This is the equivalent of a one-way ANOVA with post-hoc tests.

Comparisons of means/medians

Certain outcome indicators of food security and well-being were compared using not only their categorical classifications, but also by comparing the continuous indicators (FCS, rCSI, HFIAS). Only the FCS approached normality. For all three indicators, non-parametric tests were used to compare medians and distributions between groups (Median test and Kolmogorov-Smirnov test). For the FCS, t-tests and one-way ANOVAS were also used.

Multivariate Regression

Several types of multiple regression analyses were used. When using the FCS as the outcome variable, generalized linear models (GLM) were used to run both linear and logistic regressions for the raw score and binary "secure/insecure" indicator, respectively. Only logistic regression was used when using the rCSI and HFIAS groups as the outcome. Independent variables that are categorical are entered as such, and automatically dummied out in the analysis.

p value for the variable (as a whole if categorical)	<0.001		Model 1		Model 2		Model 3	
	<0.01		Outcome= FCS (linear)		Outcome= FCS (linear)		Outcome= FCS (linear)	
	<0.05		n= 2175	Adjusted R2=0.088	n=2175		n=2175	
Variable Typology	Independent varibles (those listed as 0/1 are coded as zero no, 1 yes, or 0 worse 1 better)		B	Sig.	B	Sig.	B	Sig.
Intercept	(Intercept)		28,551	0,000	28,602	0,000	28,805	0,000
Prog. Exp.	HH benefits from VSLA/savings activities (0/1)		7,045	0,000	8,442	0,000	8,450	0,000
Prog. Exp.	HH needs/uses CAHW (in response for time-distance to nearest CAHW) (0/1)		6,295	0,000	3,633	0,000	3,628	0,000
Prog. Exp.	HH participation in in EW OR Drought committee activities (0/1)		4,337	0,002	3,846	0,005		
Prog. Exp.	HH benefits from Water Access activities 0/1)		6,011	0,000	6,888	0,000	6,545	0,000
Prog. Exp.	HH participation in CFW activities 0/1)		8,460	0,000	6,962	0,000	6,852	0,000
Prog. Exp.	Received EW info (1/0)						5,451	0,000
Prog. Exp.	Total # of activities/prgrms. in the comm. according to project staff							
Geographic	District	Badhan			-6,972	0,000	-7,180	0,000
		Dollow			-6,425	0,001	-7,158	0,000
		Erigavo			2,159	0,335	2,173	0,330
		Eyl			-5,226	0,002	-5,539	0,001
		Luuq			-0,954	0,724	-0,811	0,763
		Odweyne			0a	n/a	0a	n/a
Geographic	Livelihood zone	Agro-pastoral			9,376	0,000	9,092	0,000
		Pastoral			0,231	0,903	0,189	0,920
		Peri-urban			4,745	0,075	4,031	0,128
		IDP community (peri-urban)			0a	n/a	0a	n/a
Demographic	Sex of head of household	Female						
		Male						
		Unknown						
Demographic	Dependency ratio (number children undr 17/number of adults)							
Demographic	Crowding (number of people/number of rooms+1)							
SES	Radio (1/0)							
SES	Bed/mattress (1/0)							
SES	Roof (1/0)							
SES	Female head/spouse education (1/0)							
Social Network	Talk regularly with someone outside village (1/0)							
Livelihood	Livelihood group (main income)	Farming (NO livestock as secondary)						
		Farming (livestock as secondary)						
		Livestock (NO agriculture as secondary)						
		Livestock (Agriculture as secondary)						
		Wage labor, Salaried Agriculture						
		Salaried (no-agriculture, other self employed/ own business						
		Fishing, sale of wild/bush products						
		Handicrafts						
		Remittances						
		Other- Aid organization assisntance						
		OTHER (domestic, other, don't know, no response)						
Livelihood	Total number of income sources	One income source						
		Two income sources						
		three or more income sources						
Shocks and coping	Total number of shocks in the past year	None or onw						
		two shocks						
		Three shocks						
		four shocks						
		five shocks						
		six shocks						
		7 or more shocks						
Shocks and coping	Severity of drought shock	No drought shock experienced						
		None, slight, or moderate impact						
		Strong impact						
		Worst ever happened						
Shocks and coping	Sold Livestock (shock coping) (1/0)							
Shocks and coping	Took children out of school (shock coping) (1/0)							

a. Set to zero because this parameter is redundant.

Model 4		Model 5		Model 6		Model 7		Model 8		Model 9		Model 10		Model 11	
Outcome= FCS (linear)		Outcome= FCS (linear)		Outcome= FCS (linear)		Outcome= FCS (linear)		Outcome= FCS (linear)		Outcome= FCS (linear)		Outcome= FCS (linear)		Outcome= FCS (linear)	
n=2175		n=2175		n=2118		n= 2118		n= 2118		n=2118	Adjusted R2=0.341	n=2169	Adjusted R2=0.340	n=2169	
B	Sig.	B	Sig.	B	Sig.	B	Sig.	B	Sig.	B	Sig.	B	Sig.	B	Sig.
28,706	0,000	25,844	0,000	31,666	0,000	38,067	0,000	36,733	0,000	36,756	0,000	35,511	0,000	33,871	0,000
8,218	0,000	7,238	0,000	6,711	0,000	5,439	0,000	5,434	0,000	5,435	0,000	5,795	0,000	5,794	0,000
3,385	0,001	3,424	0,001	2,435	0,014	1,834	0,058	1,817	0,054	1,818	0,054	1,733	0,063	1,700	0,069
2,896	0,038	2,400	0,081	2,289	0,086	1,644	0,208	1,617	0,204	1,617	0,204	1,706	0,174	1,714	0,173
6,197	0,000	5,369	0,000	5,097	0,000	4,328	0,000	4,370	0,000	4,371	0,000	4,207	0,000	4,399	0,000
6,721	0,000	6,431	0,000	4,797	0,000	4,297	0,000	3,903	0,001	3,903	0,001	4,143	0,000	4,047	0,000
4,996	0,000	3,888	0,002	3,048	0,013	2,673	0,026	3,016	0,010	3,015	0,010	3,093	0,007	3,191	0,006
										-0,002	0,990				
-7,344	0,000	-6,894	0,000	-11,624	0,000	-11,931	0,000	-11,353	0,000	-11,355	0,000	-11,883	0,000	-11,876	0,000
-7,034	0,000	-5,825	0,003	-11,180	0,000	-11,692	0,000	-11,389	0,000	-11,395	0,000	-11,245	0,000	-11,454	0,000
2,261	0,311	-0,019	0,993	-2,764	0,199	-2,767	0,193	-1,175	0,573	-1,181	0,584	-1,383	0,506	-1,588	0,444
-5,636	0,001	-5,211	0,002	-9,911	0,000	-10,432	0,000	-10,449	0,000	-10,448	0,000	-10,723	0,000	-11,007	0,000
-1,240	0,645	-1,553	0,557	-6,719	0,009	-7,409	0,004	-7,834	0,002	-7,820	0,005	-7,717	0,002	-7,599	0,002
0a	n/a	0a	n/a	0a	n/a	0a	n/a	0a	n/a	0a	n/a	0a	n/a	0a	n/a
9,075	0,000	7,468	0,000	4,040	0,030	3,616	0,052	3,793	0,038	3,813	0,120	4,138	0,022	3,853	0,032
0,203	0,915	-0,560	0,763	-3,870	0,036	-3,916	0,031	-3,633	0,043	-3,622	0,073	-3,403	0,056	-3,672	0,038
4,451	0,093	4,817	0,064	1,145	0,650	1,354	0,584	2,207	0,362	2,198	0,384	2,125	0,377	1,936	0,421
0a	n/a	0a	n/a	0a	n/a	0a	n/a	0a	n/a	0a	n/a	0a	n/a	0a	n/a
				0,537	0,688	0,534	0,687	-0,992	0,447	-0,992	0,447				
				0,809	0,478	1,118	0,325	-0,369	0,745	-0,370	0,745				
				0a	n/a	0a	n/a	0a	n/a	0a	n/a				
				0,200	0,493	0,176	0,539	0,173	0,536	0,173	0,536				
				-1,042	0,000	-1,012	0,000	-0,796	0,001	-0,796	0,001	-0,768	0,001	-0,778	0,001
				3,300	0,009	2,980	0,016	2,499	0,038	2,499	0,038	2,326	0,051	2,453	0,040
				11,131	0,000	10,790	0,000	9,901	0,000	9,901	0,000	10,078	0,000	10,069	0,000
				4,204	0,000	3,448	0,000	2,818	0,003	2,817	0,003	2,946	0,002	3,093	0,001
				0,561	0,567	0,904	0,346	1,048	0,264	1,049	0,265				
		8,391	0,000	6,882	0,000	5,748	0,000	5,572	0,000	5,572	0,000	5,622	0,000	5,729	0,000
						5,804	0,008	5,894	0,006	5,894	0,006	6,167	0,004	6,306	0,003
						4,705	0,073	4,393	0,090	4,394	0,090	4,787	0,062	5,288	0,039
						5,034	0,015	3,453	0,092	3,453	0,092	3,780	0,065	4,149	0,041
						2,654	0,308	1,119	0,664	1,119	0,664	1,708	0,504	2,009	0,431
						4,738	0,096	4,424	0,112	4,425	0,112	4,885	0,078	4,843	0,082
						13,268	0,000	12,852	0,000	12,853	0,000	12,683	0,000	12,702	0,000
						6,689	0,029	5,635	0,060	5,636	0,060	5,680	0,058	5,953	0,048
						3,259	0,113	2,969	0,142	2,970	0,142	3,296	0,102	3,604	0,073
						8,262	0,021	6,577	0,060	6,576	0,061	5,252	0,120	5,747	0,090
						10,354	0,000	10,593	0,000	10,591	0,000	10,569	0,000	11,402	0,000
						0a	n/a	0a	n/a	0a	n/a	0a	n/a	0a	n/a
						-12,572	0,000	-10,545	0,000	-10,543	0,000	-10,097	0,000	-10,445	0,000
						-6,129	0,003	-5,040	0,013	-5,038	0,013	-4,797	0,017	-5,241	0,009
						0a	n/a	0a	n/a	0a	n/a	0a	n/a	0a	n/a
								-1,768	0,411	-1,768	0,411	-1,389	0,508		
								-1,331	0,512	-1,331	0,512	-0,930	0,641		
								-5,142	0,009	-5,142	0,009	-4,466	0,022		
								-3,165	0,114	-3,164	0,114	-2,502	0,202		
								-0,420	0,841	-0,420	0,841	0,203	0,921		
								-1,704	0,462	-1,704	0,461	-0,805	0,722		
								0a	n/a	0a	n/a	0a	n/a		
								10,803	0,000	10,804	0,000	10,812	0,000	11,283	0,000
								8,912	0,000	8,912	0,000	9,121	0,000	9,067	0,000
								3,190	0,001	3,190	0,001	2,975	0,001	2,802	0,002
								0a	n/a	0a	n/a	0a	n/a	0a	n/a
								6,634	0,000	6,635	0,000	6,508	0,000	7,072	0,000
								-4,361	0,000	-4,360	0,000	-4,606	0,000	-4,512	0,000

The independent variables were flagged for significance at the 0.05, 0.01, and 0.001 levels for each of the independent variables. Note that when flagging multiple categorical variables for significance, the significance as a variable as a whole is flagged for significance, but the p-values for the differences between each category and the reference are reported in the regression summary tables.

Only the regressions of interest are shown. Numerous other regression models were run as part of the exploratory analysis in designing the final regression models.

In addition to predicting multiple outcome variables, we also examine the primary exposure variables, the SomReP high impact interventions as either village/community wide exposure or actual household level exposure to programs. For reasons described below, household level exposures were the main focus of the analyses.

Exploratory Multivariate Methods

Household level exposure models

These exploratory models generally show that program exposures are significant, and especially, that multiple program exposures are both better and additive in nature. Other variables such as livelihood zone, district and household income sources are very important together with livelihood diversity, as measured by the number of livelihood sources. Other important predictors of FCS include a measure of social capital (regular communication with anyone outside the village/community), perceived severity of shock and specific coping strategies employed (positive outcomes for selling livestock and negative for taking children out of school).

Village Level Exposure Analysis

For the village-level analysis we assign treatment at the village level, e.g. all households within a village get the same value for a particular treatment. We perform the analysis, however, using the household as the unit of observation. This allows us to gain additional precision from our control variables as we can associate each household with its outcome and particular values of controls rather than being reduced to controlling for means in some alternative scheme such as collapsing observations to the village level. We calculate Huber-White cluster robust standard errors at the village level to account for correlation in the error terms across households within a village.

The village level exposure analysis (IP identification of villages/communities where their programs are being implemented) was less useful for a number of reasons. First, a high number of villages/communities were exposed to specific interventions such s VSLAs (35/40 villages) and CFW (33/40 villages). Secondly, IP rating of village exposure and respondent identification of interventions overlapped but was not highly correlated. The reasons for this are not clear but they include spill over effects, faulty identification of intervention implementation by IPs, faulty identification of interventions by respondents, the presence of interventions being implemented by non-SomRep partners, and recall identification of interventions by respondents (interventions that may have been implemented in the past). For this reason, the research team places very little emphasis on the village exposure analysis.

Future research can design approaches aimed to quantify the impact of interventions at the village level. However, this research design is not adequate to quantify the village level impacts. Nevertheless, village level intervention exposure variables do emerge as significant in various models that test exposure interaction effects; geographic, livelihood zone and household socio-economic variables. The effects, however, are not stable across the different models.

Village Level Regressions

MODEL 1: Individual programmes only (high-impact plus CfW)

```
regress C1_FCS P6b_VSLAprojectstaff P1b_CAHWsprojectstaff P3b_EWEAprojectstaff
P5b_wateractivityprojectstaff P2b_CFWprojectstaff, vce(cluster s3_village_numb)

staff P2b_CFWprojectstaff, vce(cluster s3_village_numb)

Linear regression                               Number of obs =    2175
                                                F(  5,    39) =   12.28
                                                Prob > F      =  0.0000
                                                R-squared     =  0.0503
                                                Root MSE      =  21.888

                                  (Std. Err. adjusted for 40 clusters in s3_village_numb)
------------------------------------------------------------------------------------------
                         |               Robust
                  C1_FCS |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------------------+----------------------------------------------------------------
       P6b_VSLAprojectstaff |   7.663774   2.933993     2.61   0.013     1.729214    13.59833
     P1b_CAHWsprojectstaff |  -1.272694   3.927633    -0.32   0.748    -9.217081    6.671693
       P3b_EWEAprojectstaff |    6.70249   3.259706     2.06   0.047      .109112    13.29587
P5b_wateractivityprojectstaff |   .1034788   2.652781     0.04   0.969    -5.262278    5.469236
       P2b_CFWprojectstaff |  -1.794172   3.886085    -0.46   0.647    -9.654521    6.066176
                     _cons |   25.81885    4.20865     6.13   0.000     17.30606    34.33165
------------------------------------------------------------------------------------------
```

Model 2: Individual programs and Interactions

```
generate VSLA_CAHW_comm_INT = P6b_VSLAprojectstaff * P1b_CAHWsprojectstaff

generate VSLA_EWDROUGHT_COMM_INT = P6b_VSLAprojectstaff * P3b_EWEAprojectstaff

generate VSLA_WATER_COMM_INT = P6b_VSLAprojectstaff * P5b_wateractivityprojectstaff

generate VSLA_CfW_COMM_INT = P6b_VSLAprojectstaff * P2b_CFWprojectstaff

generate VSLA_CFW_EW_comm_3wayINT = P6b_VSLAprojectstaff * P2b_CFWprojectstaff * P3b_EWEAprojectstaff

tabl P6_VSLA_incommunity P1_CAHW_incommunity P3b_EWEAprojectstaff P5_Waterasset_incommunity P2_CFW_incommunity
VSLA_CAHW_comm_INT VSLA_EWDROUGHT_COMM_INT VSLA_WATER_COMM_INT VSLA_CfW_COMM_INT VSLA_CFW_EW_comm_3wayINT


regress C1_FCS P6b_VSLAprojectstaff P1b_CAHWsprojectstaff P3b_EWEAprojectstaff P5b_wateractivityprojectstaff
P2b_CFWprojectstaff VSLA_CAHW_comm_INT VSLA_EWDROUGHT_COMM_INT VSLA_WATER_COMM_INT VSLA_CfW_COMM_INT
VSLA_CFW_EW_comm_3wayINT, vce(cluster s3_village_numb)


Linear regression                               Number of obs =    2175
                                                F(  6,    39) =       .
                                                Prob > F      =       .
                                                R-squared     =  0.0564
                                                Root MSE      =  21.832

                                  (Std. Err. adjusted for 40 clusters in s3_village_numb)
------------------------------------------------------------------------------------------
                         |               Robust
                  C1_FCS |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------------------+----------------------------------------------------------------
        P6b_VSLAprojectstaff |   13.07509   5.242009     2.49   0.017     2.472127    23.67806
       P1b_CAHWsprojectstaff |  -4.122257   4.936961    -0.83   0.409     -14.1082     5.86369
        P3b_EWEAprojectstaff |   1.423559   4.600144     0.31   0.759     -7.88111    10.72823
P5b_wateractivityprojectstaff |   4.833252          .        .       .            .           .
         P2b_CFWprojectstaff |          0  (omitted)
          VSLA_CAHW_comm_INT |          0  (omitted)
      VSLA_EWDROUGHT_COMM_INT |  -1.283179   7.653026    -0.17   0.868    -16.76289    14.19653
          VSLA_WATER_COMM_INT |  -6.728716   3.623735    -1.86   0.071    -14.05841    .6009807
           VSLA_CfW_COMM_INT |  -7.598982   5.242009    -1.45   0.155    -18.20195    3.003983
     VSLA_CFW_EW_comm_3wayINT |    13.2851   9.46953     1.40   0.169    -5.868835    32.43903
                        _cons |   23.52389          .        .       .            .           .
------------------------------------------------------------------------------------------

NOTE:  the CFW and CAHW*vsla interaction were omitted because they must be collinear with one or another variable…

.
```

Model 3: Geographic variables and program vars

```
regress C1_FCS P6b_VSLAprojectstaff P1b_CAHWsprojectstaff P3b_EWEAprojectstaff P5b_wateractivityprojectstaff
P2b_CFWprojectstaff i.s2_district_num i.S5_livelihoodzone, vce(cluster s3_village_numb)

Linear regression                               Number of obs =    2175
                                                F( 11,    39) =       .
                                                Prob > F      =       .
                                                R-squared     =  0.1028
                                                Root MSE      =  21.313

                                   (Std. Err. adjusted for 40 clusters in s3_village_numb)
------------------------------------------------------------------------------------------
                           |               Robust
                    C1_FCS |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
---------------------------+--------------------------------------------------------------
        P6b_VSLAprojectstaff |    4.68471   1.54377     3.03   0.004     1.562141    7.807279
      P1b_CAHWsprojectstaff |  -2.825099   5.042163    -0.56   0.578    -13.02384    7.373639
      P3b_EWEAprojectstaff |   2.833935   4.316492     0.66   0.515    -5.896994    11.56486
P5b_wateractivityprojectstaff |   .2695686   2.568302     0.10   0.917    -4.925313     5.46445
      P2b_CFWprojectstaff |   5.323586   3.731704     1.43   0.162    -2.224498    12.87167
                          |
           s2_district_num |
                   Dollow |    4.61375   3.542184     1.30   0.200    -2.550994    11.77849
                  Erigavo |   11.32761   6.898976     1.64   0.109    -2.626881    25.28211
                      Eyl |   4.158724   3.899081     1.07   0.293    -3.727912    12.04536
                     Luuq |   11.52636   2.309848     4.99   0.000     6.854247    16.19847
                  Odweyne |   9.068574   3.691901     2.46   0.019       1.601    16.53615
                          |
         S5_livelihoodzone |
                 Pastoral |  -7.870667   2.467705    -3.19   0.003    -12.86207   -2.879263
              Peri-urban |  -4.424278   5.982515    -0.74   0.464    -16.52506    7.676501
            IDP community |  -9.960767   5.575256    -1.79   0.082    -21.23779    1.316253
                          |
                    _cons |   23.83243   8.228121     2.90   0.006     7.189488    40.47538
------------------------------------------------------------------------------------------
```

Model 4: Just programme variables, adding in Geographic, SES/livelihood

```
regress C1_FCS P6b_VSLAprojectstaff P1b_CAHWsprojectstaff P3b_EWEAprojectstaff P5b_wateractivityprojectstaff
P2b_CFWprojectstaff i.s2_district_num i.S5_livelihoodzone Dependency_ratio ROOF_biv  RADIO_Biv BED_biv communicate  dum5__16
dum5__17 dum5__18 dum5__19 dum5__20 dum5__21 dum5__22 dum5__23 dum5__24 dum5__25, vce(cluster s3_village_numb)

Linear regression                               Number of obs =    2164
                                                F( 26,    39) =       .
                                                Prob > F      =       .
                                                R-squared     =  0.2610
                                                Root MSE      =  19.429

                                   (Std. Err. adjusted for 40 clusters in s3_village_numb)
------------------------------------------------------------------------------
                             |               Robust
                      C1_FCS |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------------------+------------------------------------------------------------------
          P6b_VSLAprojectstaff |   2.582054   1.516933     1.70   0.097    -.4862327     5.65034
          P1b_CAHWsprojectstaff |  -4.783336   4.325553    -1.11   0.276    -13.53259     3.96592
          P3b_EWEAprojectstaff |   6.568581     2.8384     2.31   0.026     .8273744    12.30979
P5b_wateractivityprojectstaff |   .3872839   2.090662     0.19   0.854    -3.841479    4.616047
           P2b_CFWprojectstaff |    2.11116    2.80911     0.75   0.457    -3.570801     7.79312
                             |
               s2_district_num |
                       Dollow |   5.209768   3.331963     1.56   0.126    -1.529763     11.9493
                      Erigavo |    9.77769   5.669152     1.72   0.092    -1.689251    21.24463
                          Eyl |   5.955623   3.662948     1.63   0.112    -1.453388    13.36463
                         Luuq |   4.618939   2.333332     1.98   0.055      -.10067    9.338548
                      Odweyne |   15.60224   3.946561     3.95   0.000     7.619567    23.58491
                             |
            S5_livelihoodzone |
                     Pastoral |  -5.816027   2.457658    -2.37   0.023    -10.78711    -.844944
                   Peri-urban |   3.736009   4.463717     0.84   0.408    -5.292712    12.76473
                IDP community |  -.9191677   4.700642    -0.20   0.846    -10.42711    8.588779
                             |
            Dependency_ratio |   .1040126    .295186     0.35   0.726    -.4930574    .7010826
                     ROOF_biv |   4.682836   1.077806     4.34   0.000     2.502767    6.862904
                    RADIO_Biv |   4.048922   1.552112     2.61   0.013     .9094784    7.188365
                      BED_biv |   12.94478   1.566288     8.26   0.000     9.776665     16.1129
                  communicate |   7.813526   1.217457     6.42   0.000     5.350987    10.27607
                     dum5__16 |   6.698875    3.35158     2.00   0.053    -.0803354    13.47809
                     dum5__17 |   12.97736   3.632316     3.57   0.001     5.630311    20.32442
                     dum5__18 |    6.54735   3.021531     2.17   0.036     .4357262    12.65897
                     dum5__19 |   9.612219   3.168379     3.03   0.004     3.203568    16.02087
                     dum5__20 |   5.514442   3.406279     1.62   0.114    -1.375408    12.40429
                     dum5__21 |   14.23997   3.106115     4.58   0.000     7.957263    20.52268
                     dum5__22 |   7.983517    3.89838     2.05   0.047     .0982995    15.86873
                     dum5__23 |   4.310527   2.587019     1.67   0.104    -.9222128    9.543267
                     dum5__24 |   7.850258    5.17861     1.52   0.138    -2.624469    18.32498
                     dum5__25 |   13.14538   3.835636     3.43   0.001     5.387072    20.90368
                        _cons |   5.763623   7.126095     0.81   0.424    -8.650265    20.17751
------------------------------------------------------------------------------
```

dum5__16	Livelihood_Groups=Farm/crop production and sales MAIN (NO livestock as secondary)
dum5__17	Livelihood_Groups=Farm/crop production and sales MAIN, Livestock as SECONDARY
dum5__18	Livelihood_Groups=Livestock production and sales MAIN (NO agriculture as secondary)
dum5__19	Livelihood_Groups=Livestock production sales MAIN, Agriculture as SECONDARY
dum5__20	Livelihood_Groups=Wage Labor (agriculture or other), and Salaried Agriculture work
dum5__21	Livelihood_Groups=Salaried work (non-agricultural) and other self employed/own business
dum5__22	Livelihood_Groups=Fishing and Sale of wild/bush products (e.g., honey, charcoal)
dum5__23	Livelihood_Groups=Handicrafts
dum5__24	Livelihood_Groups=Remittances
dum5__25	Livelihood_Groups=Other- Aid Organization
dum5__26	Livelihood_Groups=OTHER (domestic, other, don't know, no response)

Model 5a: Above, with positive coping and severity as potential pathway variables

```
regress C1_FCS P6b_VSLAprojectstaff P1b_CAHWsprojectstaff P3b_EWEAprojectstaff P5b_wateractivityprojectstaff P2b_CFWprojectstaff
i.s2_district_num i.S5_livelihoodzone Dependency_ratio ROOF_biv  RADIO_Biv BED_biv communicate  dum5__16 dum5__17 dum5__18 dum5__19
dum5__20 dum5__21 dum5__22 dum5__23 dum5__24 dum5__25 i.Drought_impact_cleaned dis_eff_sellILS dis_eff_childrenoutofschool, vce(cluster
s3_village_numb)

Linear regression                               Number of obs =    2164
                                                F( 31,    39) =       .
                                                Prob > F      =       .
                                                R-squared     =  0.3011
                                                Root MSE      =  18.916

                                   (Std. Err. adjusted for 40 clusters in s3_village_numb)
------------------------------------------------------------------------------------------
                                 |               Robust
                          C1_FCS |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
---------------------------------+--------------------------------------------------------------
            P6b_VSLAprojectstaff |   2.435455   1.350667     1.80   0.079    -.2965269    5.167438
           P1b_CAHWsprojectstaff |  -4.203681    4.06793    -1.03   0.308    -12.43185    4.024484
           P3b_EWEAprojectstaff |   6.347096   2.602785     2.44   0.019     1.082467    11.61173
    P5b_wateractivityprojectstaff |   .2881299   1.925145     0.15   0.882    -3.605844    4.182103
           P2b_CFWprojectstaff |   5.691012   2.802513     2.03   0.049     .0223949    11.35963
                                 |
                 s2_district_num |
                          Dollow |   4.296777    3.04463     1.41   0.166    -1.861568    10.45512
                         Erigavo |    10.7711   5.368342     2.01   0.052    -.0873918     21.6296
                             Eyl |   4.571304   3.346776     1.37   0.180     -2.19819     11.3408
                            Luuq |   5.962262   2.147341     2.78   0.008     1.618854    10.30567
                          Odweyne |   14.97575   3.374523     4.44   0.000     8.150136    21.80137
                                 |
                S5_livelihoodzone |
                        Pastoral |  -5.724873   2.122417    -2.70   0.010    -10.01787   -1.431879
                      Peri-urban |    6.14989   4.054917     1.52   0.137    -2.051954    14.35173
                    IDP community |  -.3533515   4.489515    -0.08   0.938    -9.434252    8.727549
                                 |
                Dependency_ratio |   .0965388   .2856382     0.34   0.737     -.481219    .6742966
                        ROOF_biv |   4.136587    .95474     4.33   0.000     2.205444    6.067731
                        RADIO_Biv |   3.650459   1.404353     2.60   0.013     .8098862    6.491031
                         BED_biv |   11.87325   1.418336     8.37   0.000     9.004394    14.74211
                     communicate |   7.606654   1.113583     6.83   0.000     5.354219    9.859089
                        dum5__16 |   7.227368   3.014891     2.40   0.021     1.129175    13.32556
                        dum5__17 |   12.30572   3.577476     3.44   0.001     5.069594    19.54185
                        dum5__18 |   4.838484   2.908026     1.66   0.104    -1.043554    10.72052
                        dum5__19 |   7.074093   3.261637     2.17   0.036     .4768089    13.67138
                        dum5__20 |    5.41937   3.207036     1.69   0.099    -1.067473    11.90621
                        dum5__21 |   14.03833   3.149989     4.46   0.000     7.666872    20.40978
                        dum5__22 |   7.147485   3.789416     1.89   0.067    -.5173317     14.8123
                        dum5__23 |   4.606227   2.499953     1.84   0.073    -.4504053     9.66286
                        dum5__24 |    6.85183   5.060999     1.35   0.184    -3.385006    17.08867
                        dum5__25 |   14.53443   3.921695     3.71   0.001     6.602054    22.46681
                                 |
           Drought_impact_cleaned |
None, slight, or moderate impact |  -2.301753   5.351453    -0.43   0.669    -13.12609    8.522582
                  Strong impact |   -8.60043   5.517493    -1.56   0.127    -19.76061    2.559752
              Worst ever happened |  -11.29688    4.97337    -2.27   0.029    -21.35647   -1.237284
                                 |
                 dis_eff_sellILS |   9.300445   1.757572     5.29   0.000     5.745419    12.85547
       dis_eff_childrenoutofschool |  -3.714594   1.416415    -2.62   0.012    -6.579563   -.8496238
                           _cons |   11.30417    8.31309     1.36   0.182    -5.510637    28.11899
------------------------------------------------------------------------------------------
```

Model 5b: repeated, but not taking village cluster into account

```
regress C1_FCS P6b_VSLAprojectstaff P1b_CAHWsprojectstaff P3b_EWEAprojectstaff P5b_wateractivityprojectstaff
P2b_CFWprojectstaff i.s2_district_num i.S5_livelihoodzone Dependency_ratio ROOF_biv  RADIO_Biv BED_biv communicate  dum5__16
dum5__17 dum5__18 dum5__19 dum5__20 dum5__21 dum5__22 dum5__23 dum5__24 dum5__25 i.Drought_impact_cleaned dis_eff_sellLS
dis_eff_childrenoutofschool

  Source |       SS       df       MS              Number of obs =    2164
-------------+------------------------------       F( 33,  2130) =   27.81
       Model |  328422.355    33  9952.19256         Prob > F      =  0.0000
    Residual |  762141.849  2130  357.813075         R-squared     =  0.3011
-------------+------------------------------       Adj R-squared =  0.2903
       Total |  1090564.2  2163   504.19057         Root MSE      =  18.916

------------------------------------------------------------------------------
                      C1_FCS |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------------------+------------------------------------------------
          P6b_VSLAprojectstaff |   2.435455     1.5118     1.61   0.107    -.5293029    5.400214
          P1b_CAHWsprojectstaff |  -4.203681   2.199899    -1.91   0.056    -8.517855    .1104935
          P3b_EWEAprojectstaff |   6.347096   2.709112     2.34   0.019     1.034314    11.65988
   P5b_wateractivityprojectstaff |   .2881299   1.178756     0.24   0.807    -2.023503    2.599762
          P2b_CFWprojectstaff |   5.691012    4.94124     1.15   0.250    -3.999147    15.38117
                              |
            s2_district_num |
                      Dollow  |   4.296777   2.543357     1.69   0.091    -.6909452    9.284499
                     Erigavo  |    10.7711   2.271611     4.74   0.000     6.316296    15.22591
                         Eyl  |   4.571304   2.022026     2.26   0.024     .6059523    8.536655
                        Luuq  |   5.962262   3.714036     1.61   0.109    -1.321253    13.24578
                     Odweyne  |   14.97575   2.407099     6.22   0.000     10.25524    19.69626
                              |
          S5_livelihoodzone |
                     Pastoral  |  -5.724873   1.466143    -3.90   0.000    -8.600094   -2.849652
                   Peri-urban  |   6.14989   5.249343     1.17   0.242    -4.144483    16.44426
                IDP community  |  -.3533515   3.062187    -0.12   0.908    -6.358539    5.651836
                              |
          Dependency_ratio |   .0965388   .2889744     0.33   0.738    -.4701627    .6632402
                   ROOF_biv |   4.136587   .9857641     4.20   0.000     2.203427    6.069748
                  RADIO_Biv |   3.650459   1.242573     2.94   0.003     1.213675    6.087243
                    BED_biv |   11.87325   1.063188    11.17   0.000     9.788256    13.95824
                communicate |   7.606654   .8851973     8.59   0.000     5.870712    9.342595
                    dum5__16 |   7.227368   2.249833     3.21   0.001     2.815269    11.63947
                    dum5__17 |   12.30572   2.551276     4.82   0.000     7.302469    17.30897
                    dum5__18 |   4.838484   2.117866     2.28   0.022     .6851834    8.991785
                    dum5__19 |   7.074093   2.555595     2.77   0.006     2.062372    12.08581
                    dum5__20 |    5.41937   2.905667     1.87   0.062    -.2788698    11.11761
                    dum5__21 |   14.03833   2.532097     5.54   0.000     9.072686    19.00397
                    dum5__22 |   7.147485   3.140788     2.28   0.023     .9881538    13.30682
                    dum5__23 |   4.606227   2.103912     2.19   0.029     .4802912    8.732164
                    dum5__24 |    6.85183   3.551844     1.93   0.054    -.1136136    13.81727
                    dum5__25 |   14.53443   2.666225     5.45   0.000     9.305755    19.76311
                              |
          Drought_impact_cleaned |
None, slight, or moderate impact  |  -2.301753   3.273507    -0.70   0.482    -8.721357    4.117851
                Strong impact  |   -8.60043   3.028997    -2.84   0.005    -14.54053   -2.66033
            Worst ever happened  |  -11.29688   3.072488    -3.68   0.000    -17.32227   -5.271485
                              |
                dis_eff_sellLS |   9.300445     1.1076     8.40   0.000     7.128356    11.47254
      dis_eff_childrenoutofschool |  -3.714594   1.139021    -3.26   0.001    -5.948304   -1.480883
                          _cons |   11.30417   7.530759     1.50   0.133    -3.464236    26.07258
------------------------------------------------------------------------------

.
```

Regression Results (including random effects for enumerator and village and other fixed effects)

These analyses took in to account the multi-level nature of this analytical problem, where both household and village level variables contribute to program outcomes. These models confirm that key program exposures and some individual household variables, primarily associated with regular outside communications and livelihoods, were important. A key finding is that VSLA and CFW are more consistently associated with acceptable food security. Regular communication outside the community was highly significant and may capture a number of SomReP program effects, including early warning information, so this analysis may reflect some underestimation of program effects.

The coding guide for variables is as follows:

```
Livelihood_Groups
        1.0 Farm/crop production and sales MAIN (NO livestock as secondary)
1.5 Farm/crop production and sales MAIN, Livestock as SECONDARY
2.0 Livestock production and sales MAIN (NO agriculture as secondary)
2.5 Livestock production sales MAIN, Agriculture as SECONDARY
3.0 Wage Labor (agriculture or other), and  Salaried Agriculture work
6.0 Salaried work (non-agricultural) and other self employed/own business
7.0 Fishing and Sale of wild/bush products (e.g., honey, charcoal)
8.0 Handicrafts
13.0 Remittances
14.0 Other- Aid Organization
20.0 OTHER (domestic, other, don't know, no response)


S5_livelihoodzone
 1 Agro-pastoral
2 Pastoral
3 Peri-urban
4 IDP community
```

	Value	Std.Error	DF	t-value	p-value
(Intercept)	27.281622	3.056952	1510	8.924452	0.0000
VSLA.bene	5.757162	1.305742	1510	4.409111	0.0000
CFW.bene	4.776288	1.132568	1510	4.217220	0.0000
CAHW.bene	0.827756	0.982816	1510	0.842229	0.3998
earlywarninginfo	1.879805	1.159996	1510	1.620527	0.1053
H2O.bene	4.030500	1.105297	1510	3.646532	0.0003
communicate	3.189141	0.947581	1510	3.365560	0.0008
factor(S5_livelihoodzone)2	-5.994279	1.957264	127	-3.062581	0.0027
factor(S5_livelihoodzone)3	-2.751584	2.185181	127	-1.259202	0.2103
factor(S5_livelihoodzone)4	-6.805182	2.436494	127	-2.793022	0.0060
beds	9.187409	1.019054	1510	9.015625	0.0000
radio	3.513569	1.188409	1510	2.956532	0.0032
rooms	2.317117	0.546645	1510	4.238799	0.0000
factor(Livelihood_Groups)1.5	-2.233206	2.126398	1510	-1.050229	0.2938
factor(Livelihood_Groups)2	-3.250292	1.521497	1510	-2.136247	0.0328
factor(Livelihood_Groups)2.5	-1.878309	2.118286	1510	-0.886712	0.3754
factor(Livelihood_Groups)3	-3.882476	2.543051	1510	-1.526700	0.1270
factor(Livelihood_Groups)6	4.688114	2.003724	1510	2.339701	0.0194
factor(Livelihood_Groups)7	-6.549416	2.806733	1510	-2.333466	0.0198
factor(Livelihood_Groups)8	-1.871385	1.476705	1510	-1.267271	0.2053
factor(Livelihood_Groups)13	2.614040	3.318360	1510	0.787750	0.4310
factor(Livelihood_Groups)14	-4.967190	2.332688	1510	-2.129384	0.0334
factor(Livelihood_Groups)20	-8.986696	2.227559	1510	-4.034325	0.0001
I(education_female > 1)TRUE	1.276001	0.974010	1510	1.310050	0.1904

Adequate consumption was also modeled as a binary indicator. Many of the factors were no longer significant in this case, but that makes sense given that this is a less nuanced model. This table is for the reduced model with only the predictive factors retained (note that only the "no response/none" category for livelihood groups was significant here).

Fixed effects:

	Estimate	Std. Error	z value	Pr(>|z|)	
(Intercept)	-2.07172	0.41771	-4.960	7.06e-07	***
VSLA.bene	0.44494	0.21690	2.051	0.040232	*
CFW.bene	0.52175	0.17617	2.962	0.003059	**
communicate	0.69250	0.15018	4.611	4.00e-06	***
factor(S5_livelihoodzone)2	-0.78154	0.27378	-2.855	0.004309	**
factor(S5_livelihoodzone)3	-0.35633	0.32245	-1.105	0.269139	
factor(S5_livelihoodzone)4	-0.76347	0.41952	-1.820	0.068782	.
beds	1.21543	0.17020	7.141	9.24e-13	***
radio	0.41397	0.19588	2.113	0.034570	*
rooms	0.22615	0.09086	2.489	0.012813	*
I(Livelihood_Groups == 20)TRUE	-1.20936	0.33623	-3.597	0.000322	***

For predicting the "little or no hunger" on the HHS, only VSLA was significant after accounting for a few of the socioeconomic status (SES) factors. For this model bed ownership was clearly the most important predictor and livelihood zone was also very significant.

Fixed effects:

	Estimate	Std. Error	z value	Pr(>|z|)	
(Intercept)	-0.76022	0.36071	-2.108	0.03507	*
VSLA.bene	0.48611	0.19721	2.465	0.01370	*
factor(S5_livelihoodzone)2	-0.81251	0.39122	-2.077	0.03781	*
factor(S5_livelihoodzone)3	-1.21828	0.46928	-2.596	0.00943	**
factor(S5_livelihoodzone)4	-1.37903	0.69265	-1.991	0.04649	*
beds	1.05722	0.15662	6.750	1.48e-11	***
radio	0.36503	0.18004	2.027	0.04261	*
rooms	0.25098	0.08271	3.034	0.00241	**
I(Livelihood_Groups == 20)TRUE	-0.76421	0.31144	-2.454	0.01414	*

A logical conclusion from these results is that the majority of these programs are somewhat helpful, but only the VSLA and the CFW are pushing people into adequate consumption levels who wouldn't already be there based on their SES factors.

Propensity Score Matching

PSM matching was done to test the impacts of household (HH) programme exposure on FS outcomes. This strategy ensures that there are no observable factors aside from the programmes themselves that are impacting food security outcomes. If NGOs are selecting which villages to initiate programmes in based on livelihood zone or existing connections, then an unbiased analysis would ensure that a particular livelihood zone or village is equally represented in the treatment and control groups before the program impact is calculated.

First, the exposure and non-exposure groups were defined using the number of programmes the household reported participating in or benefiting from out of the set of high-intensity programmes (VSLA, CAHW, Water, EW/DRM/Drought, and CfW). Households were exposed to anywhere from zero to all five programmes.

Households exposed to zero programmes were considered the control group, and household exposed to 3, 4, or 5 programmes were considered the treatment group. In order to maximize the detectable treatment impact of programme exposure, households exposed to only 1 or 2 programmes were excluded from this analysis. 1018 households had zero exposure (none of the five programmes/activities), 182 households had exposure to three, four, or all five programmes. The remaining 975 households were exposed to one or two programmes and thus excluded from this analysis.

Next, propensity scores were created using logistic regression that calculated the probability of being exposed to 3 or more programs (as outlined above). The variables included in this were:

- District (dummies)
- Livelihood zone (dummies)
- Sex of head of household (dummies for male, female, unknown)
- Level of education of the female head/spouse (bivariate)
- Livelihood group (dummies)
- Roof construction material (bivariate)
- Radio ownership (bivariate)
- Bed/mattress ownership (bivariate)
- Crowding (continuous)
- Dependency ratio (continuous).

Because removing bias from unobserved confounders at the geographic level was a top priority, we forced matches to only occur within unique combinations of district and livelihood zone. For example a household exposed to three or more programmes in the pastoral livelihood zone in Gedo would only be matched with a household exposed to no programmes in the pastoral livelihood zone in Gedo.

Then matching was done with a caliper of 0.2 which required paired treatment and control households to be within a 20% chance of receiving three or more programmes. Of the 182 exposure households, matches were found for 174, and no matches meeting these criteria were found for 8 households. This resulted in a dataset of 348 households total.

This dataset was checked for balance (using standardized differences in means). Districts and livelihood zones all balanced completely. Sex of household head did not match well. A few of the livelihood dummies had a standardized difference above 0.1 Household assets including radio, bed, and roof all matched reasonably well. Crowding and dependency ratio were not perfectly matched, with a standardized difference of 0.14 and 0.11 respectively.

PSM- case controls. Number of high intensity and CfW programmes HH benefits from/participates in		NO HH exposure (selected controls)	HH exposure to 3, 4 or all 5 programmes	Standardized difference
		n=174	n=174	
Sex of head of household	Female	25%	13%	**-0.33**
	Male	58%	63%	**0.11**
	Unknown	17%	24%	**0.19**
Livelihood (income source) groups	Farm/crop production and sales MAIN (NO livestock as secondary)	16%	14%	**-0.06**
	Farm/crop production and sales MAIN, Livestock as SECONDARY	5%	11%	**0.21**
	Livestock production and sales MAIN (NO agriculture as secondary)	20%	16%	**-0.12**
	Livestock production sales MAIN, Agriculture as SECONDARY	8%	6%	**-0.07**
	Wage Labor (agriculture or other), and Salaried Agriculture work	1%	1%	**0.00**
	Salaried work (non-agric.) and other self employed/own business	6%	5%	**-0.08**
	Fishing and Sale of wild/bush products	3%	3%	**0.00**
	Handicrafts	25%	25%	**0.00**
	Remittances	2%	3%	**0.04**
	Other- Aid Organization	9%	14%	**0.16**
	OTHER (domestic, other, don't know, no response)	3%	2%	**-0.07**
Household Assets	Improved roof material	46%	51%	**0.09**
	Owns Radio	20%	22%	**0.04**
	Owns bed/mattress	34%	37%	**0.07**
Education, Demographics	Female head/spouse education- incomplete primary and higher	28%	32%	**0.09**
	MEAN- Crowding (# of people/# of rooms+1)	3.94	3.67	**0.00**
	MEAN- Dependency ratio (# children under 17/# of adults)	1.64	1.49	**0.00**

Note: The matching was forced at the District and Livelihood level, and so the standardized differences for those variables are zero. They are not included in this table.

Using this matched dataset, food security outcomes were compared between the exposure and control groups.

- The exposure group has significantly higher prevalence of acceptable food consumption, and significantly lower prevalence of poor food consumption, compared to the no exposure group.
- The control group has significantly higher prevalence of severe hunger in the household (HHS) compared to the no exposure group.
- The exposure group has significantly less Severely food insecure Access (HFIAP) and more food secure compared to the no exposure group (though not significant).
- The exposure group has a lower prevalence of households that report not recovering at all from the drought shock (though not significant).
- Little difference was seen in the rCSI groups (none significant).

		PSM- case controls. Number of high impact and CfW programmes HH benefits from/participates in	
		NO HH exposure (selected controls)	HH exposure to 3, 4 or all 5 programmes
		(A)	(B)
		Column N %	Column N %
Food Consumption Groups	**Poor Food Consumption**	54.0% B	28.2%
	Borderline Food Consumption	18.4%	16.7%
	Acceptable Food Consumption	27.6%	55.2% A
HHS Categories	**Little to no hunger in household**	39.1%	46.2%
	Moderate hunger in household	41.4%	42.8%
	Severe hunger in household	19.5% B	11.0%
HFIAP (household food insecurity access scale groups)	**Food Secure**	8.7%	13.5%
	Mildly Food Insecure Access	6.4%	5.3%
	Moderately Food Insecure Access	6.4%	12.9% A
	Severely Food Insecure Access	78.6% B	68.4%
rCSI categories	**No or low coping (rCSI < 4)**	12.1%	16.1%
	Moderate coping (rCSI 4-9)	8.6%	8.0%
	High coping (rCSI 10 and higher)	79.3%	75.9%
Recovery from drought- extent the HH was able to recover from recent drought impacts	**Did not recover**	64.0%	58.9%
	Recovered some, but worse off than before event	29.7%	31.5%
	Recovered to same level as before event	4.7%	7.1%
	Recovered and better off than before event	1.7%	2.4%

Results are based on two-sided tests. For each significant pair, the key of the category with the smaller column proportion appears in the category with the larger column proportion.
Significance level for upper case letters (A, B, C): .05[1]

1. Tests are adjusted for all pairwise comparisons within a row of each innermost subtable using the Bonferroni correction.

The differences between the continuous variables was also tested. None are normally distributed, though the FCS was close. The t-test was only used on the FCS. Non-parametric tests (median test, Mann-Whitney U test) were used on all three indicators.

- Mean FCS significantly higher in exposure group ($p<0.001$, t-test) as is the median FCS (median test $p<0.001$, Mann-Whitney U test $p<0.001$)
- rCSI is not significantly different between groups (median test $p = 0.163$, Mann-Whitney U test $p=0.996$)
- The median HFIAS is significantly higher (worse) in the no exposure group (median test $p = 0.026$, Man-Whitney $p=0.012$)

PSM- case controls. Number of high intensity and CfW programmes HH benefits from/participates in	Food Consumption Score		reduced Coping Strategies Index		HFIAS (household food insecurity access scale)	
	Mean	Median	Mean	Median	Mean	Median
NO HH exposure (selected controls)	30.2	24.0	21.9	19.0	13.0	14.0
HH exposure to 3, 4 or all 5 programmes	49.3	47.5	21.6	21.5	11.0	12.0
Total	**39.8**	**35.8**	**21.7**	**20.5**	**12.0**	**13.0**

PSM- case controls. Number of high intensity and CfW programmes HH benefits from/participates in	Food Consumption Score		reduced Coping Strategies Index		HFIAS (household food insecurity access scale)	
	Mean	Median	Mean	Median	Mean	Median
NO HH exposure (selected controls)	33.0	28.0	22.8	19.0	13.1	13.0
HH exposure to 3, 4 or all 5 programmes	49.4	47.5	21.8	22.0	11.1	12.0
Total	**41.2**	**36.5**	**22.3**	**21.0**	**12.1**	**12.0**

Note: Higher FCS is considered BETTER food security. Higher rCSI and higher HFIAS is considered WORSE food security.

Annex 6: Data Quality Control Problems

The mosaic plots below suggest that operator error poses a significant risk to the accuracy of the research. In these plots color schemes vary according to the specific analyses. The first plot displays the frequency of FCS categories reported by each enumerator; the second plot shows the various districts from which respondents were interviewed (color scheme reflects the different districts). The next three graphs show the distibutions of the HHS categories (green is best to red worst) for enumerators in three districts.

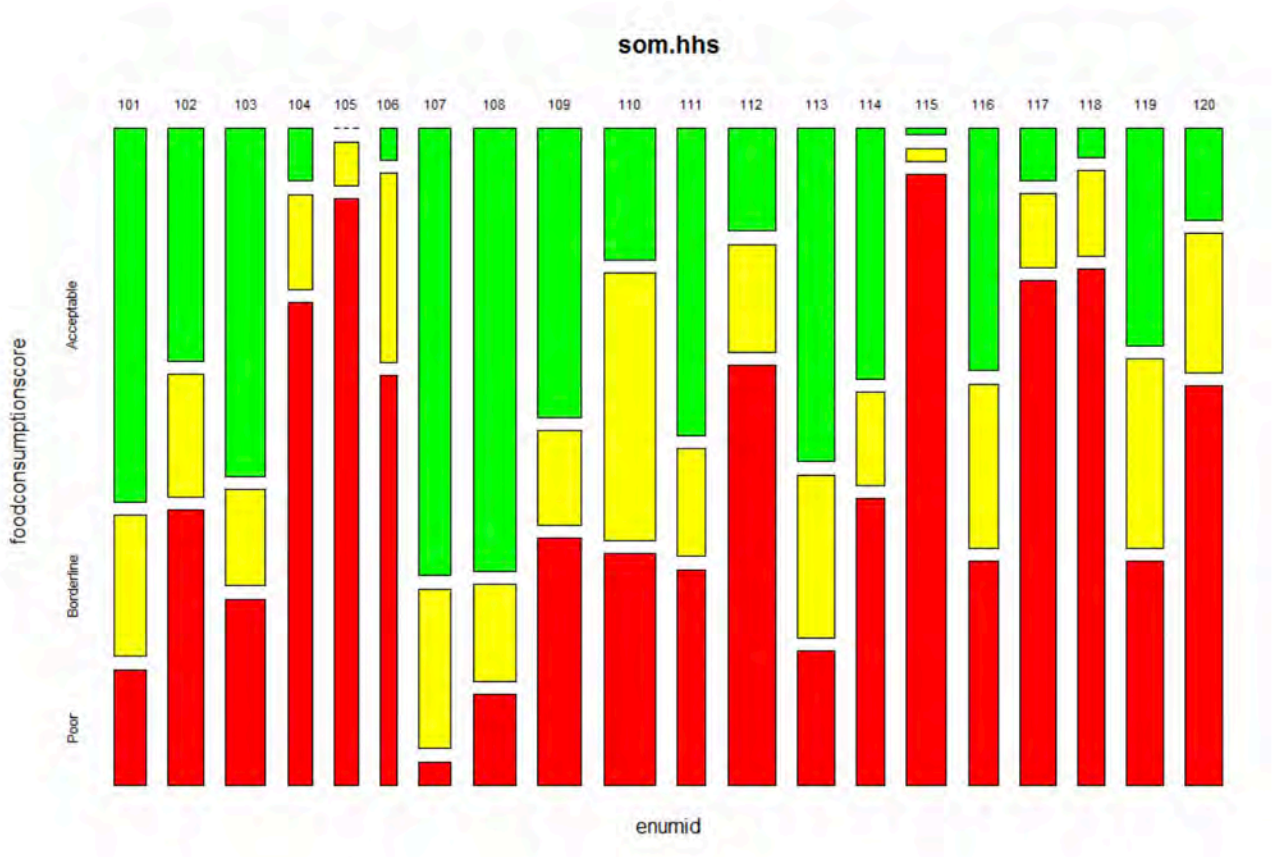

Figure 7: Plot showing Operator Bias in Food Consumption Score Data Collection

Note in this figure, operators report widely different FCS categories. Operators 105 and 115 almost always reflect poor food consumption (red portion of bars). Operators 107 and 108 report that the majority of respondents have acceptable FC (green portion of bars). Because the number of interviews done by each operator (width of bars) varies, the potential bias of their error also may be magnified.

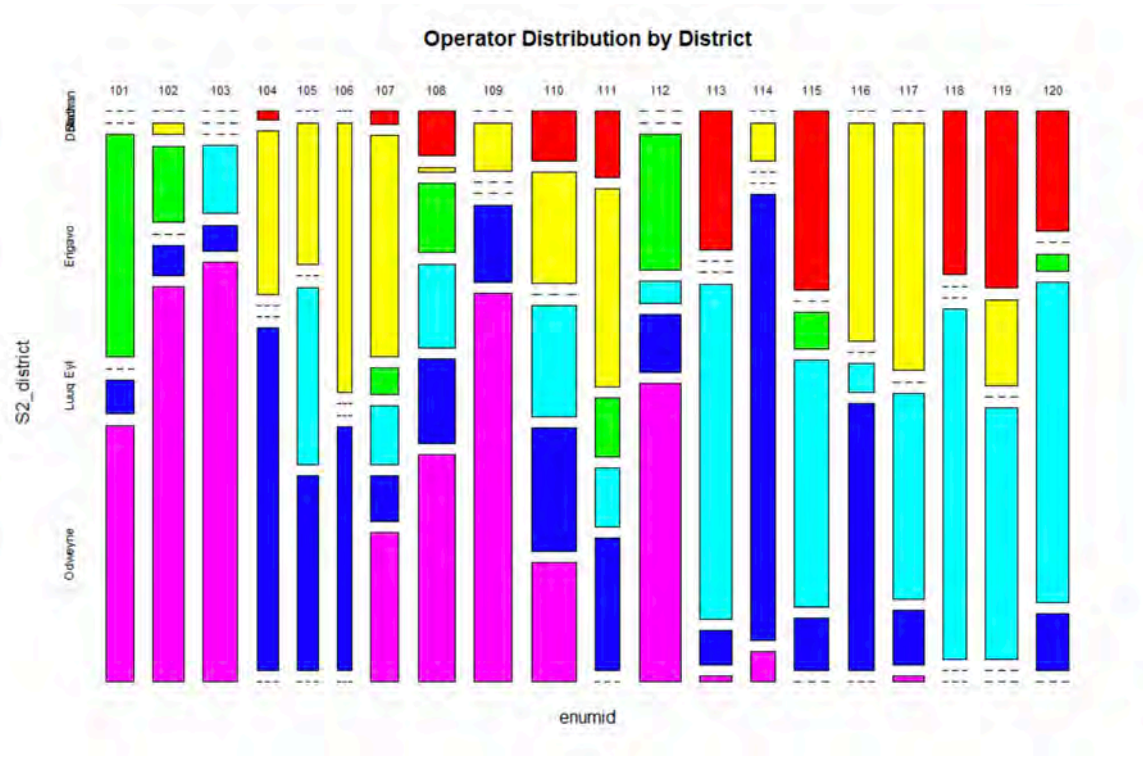

Figure 8: Mosaic Plot showing Operator Distribution by District

This figure demonstrates that, while operators often interviewed in some districts more than others, they tended to interview in several districts (multi-colored bars represent multiple districts). Thus, while some districts may have higher food insecurity than others, the extent of the variation in food consumption categorization reported by different operators can't be explained by operator interviews being restricted to single districts.

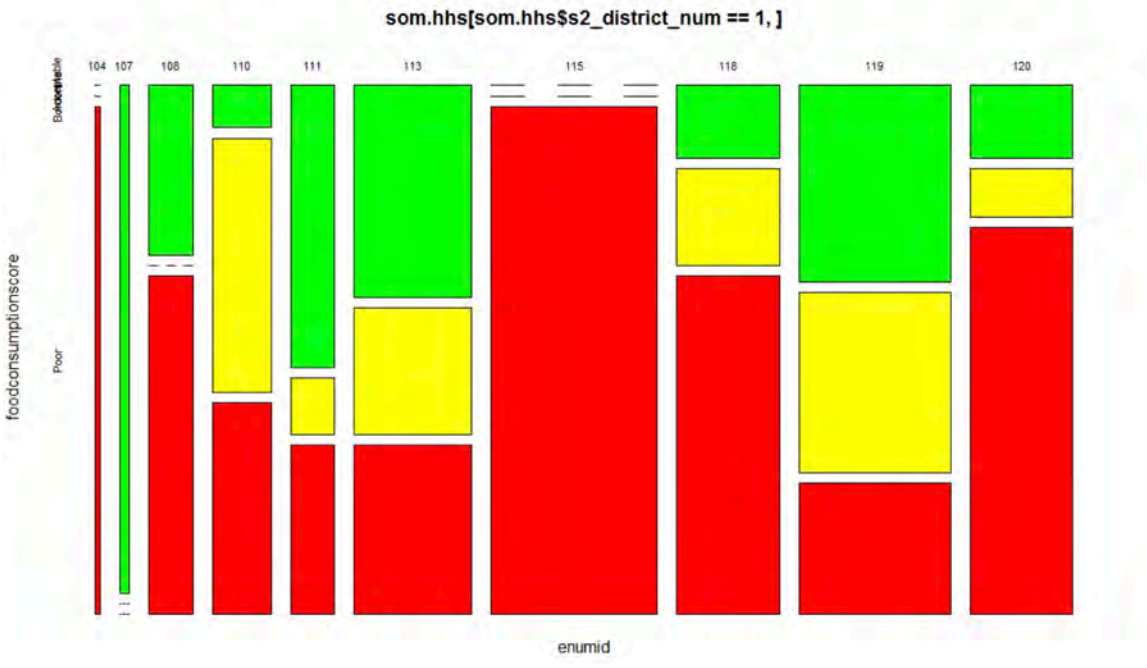

Figure 9: Mosaic Plot showing Operator and Food Consumption Score in Dollow District

Moreover, when mosaic plots of FCS are plotted by district, it is clear that in Dollow District, enumerators 104 and 115 are the only enumerators that report 100% poor food consumption. Operator 107 is the only operator that reports 100% acceptable food consumption. Operator 115 conducted a large portion of interviews in the district (width of the bar).

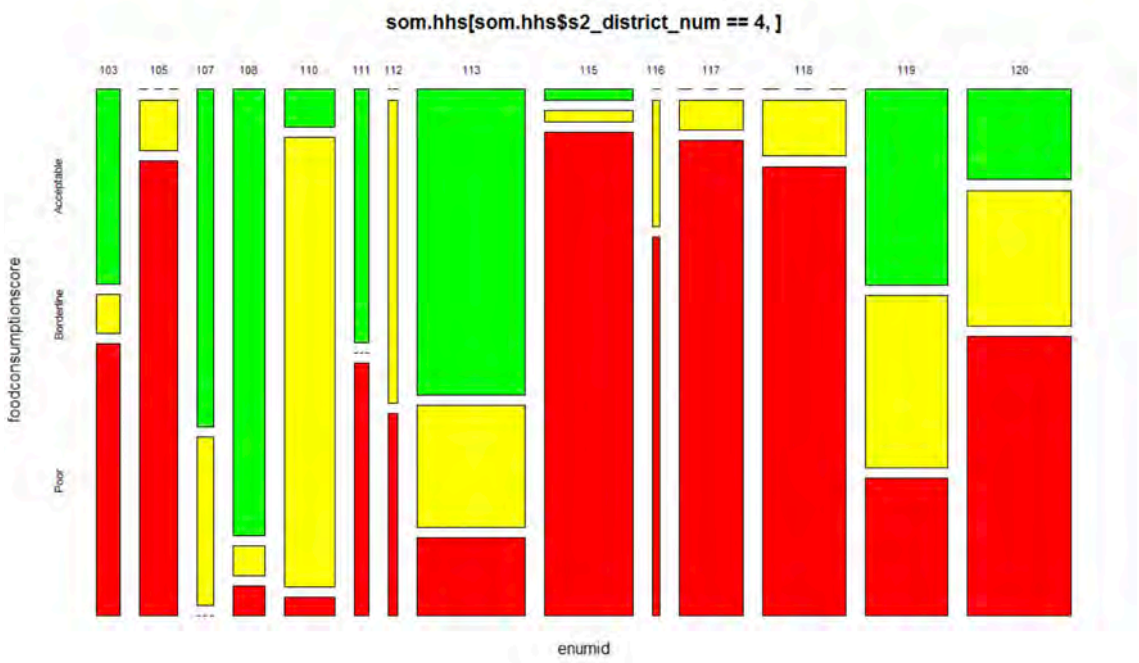

Figure 10: Mosaic Plot showing Operator and Food Consumption Score in Eyl District

In Eyl District, again, operators 105 and 115 have disproportionately high levels of poor food consumption categorization. Again, interviewers 107 and 108 have high levels of acceptable food consumption categorization.

These findings suggest that operator error is substantial. This has implications for the analysis and also for future data collection work. Our final household regression models took into account operators.

Future work should exact higher levels of interview quality. This can be achieved through longer and more rigorous training, improved supervision and monitoring, and more explicit interview protocols.

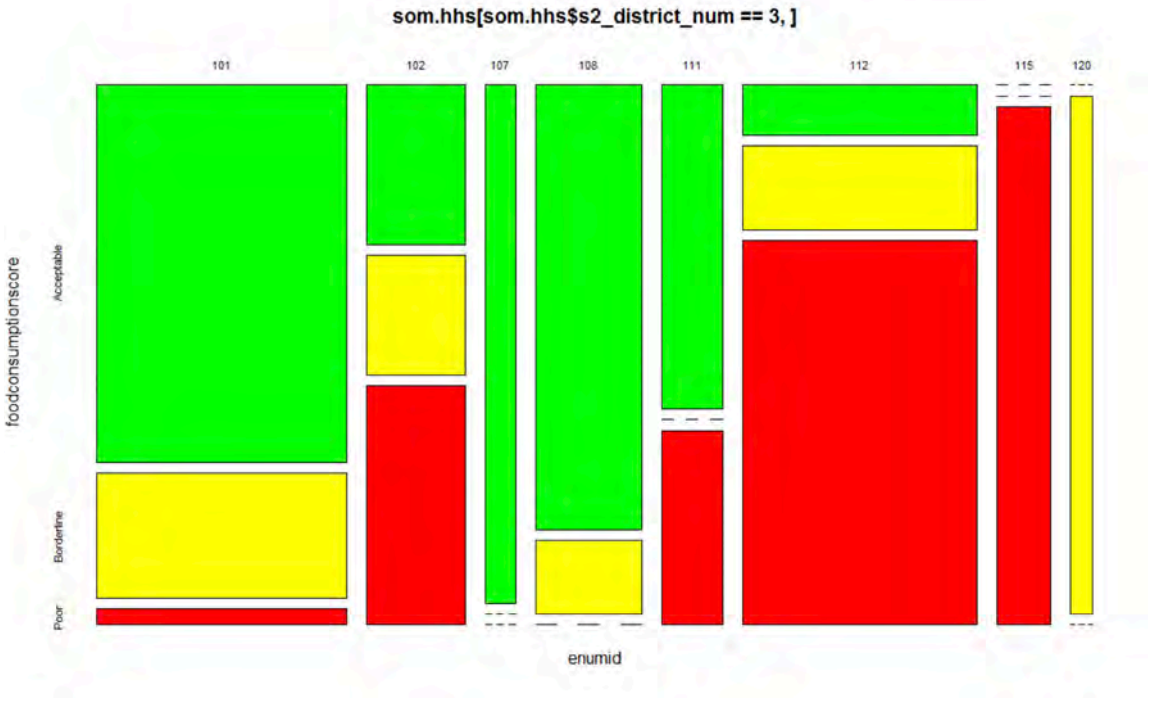

Figure 11: Mosaic Plot showing Operator and Food Consumption Score in Erigavo Disrict

Here again, in Erigavo District interviewer 115 consistently reported food consumption categorization as 'poor' and 107, as 'acceptable'.

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