DATA-DRIVEN RESILIENCE PROGRAMMING WITH COMMUNITIES:

WOMEN'S EMPOWERMENT AND FOOD SECURITY

Program to Enhance Resilience in Somalia (PROGRESS)

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Executive Summary

The Program to Enhance Resilience in Somalia (PROGRESS) is a USAID-funded effort led by Catholic Relief Services (CRS) to strengthen resilience among populations in Somalia. This report discusses activities and findings from qualitative and quantitative engagement efforts made by PROGRESS partners CRS, Benadir University's Somali Disaster Resilience Institute (BU/SDRI), and the George Washington University's Institute for Disaster and Fragility Resilience (GW/IDFR). These efforts include ongoing interventions, stakeholder engagement, and qualitative and quantitative data collection.

In the project, local engagement, program intervention, and data collection activities were conducted with community members in Afgooye, Baidoa, and Belet Hawa districts, with a focus on Women, Youth, and Resilience Committees (RCs). The researchers explored associations between women's empowerment and areas of relevance for PROGRESS resilience programming. From the initial qualitative and pilot quantitative findings, it was evident that women's empowerment and training were among the key drivers of food security. Regression and structural equation models were constructed with food security as a dependent variable. Independent variables included women's empowerment and training, among others. As a follow on to the 2016 pilot quantitative study, additional quantitative assessment was carried out in 600 households from 26 villages in the three districts in 2017.

This report builds on previous reports to deepen understanding of coping and adaptation and pathways to strengthen resilience to drought and famine. Coping strategies describe approaches used by households and communities to manage the impacts of a shock/stressor (such as drought) that can have a negative impact on resilience (eroding resilience) or approaches that have no net improvement in resilience). The study differentiated between reactive and proactive coping strategies. Reactive coping strategies (e.g., sale of farming land, breeding stock, draught animals, milking animals, farm implements, and household valuables) may provide short-term relief but have more corrosive effects than proactive strategies (e.g., out-migration to look for food or work, borrowing money or other assets, and receiving humanitarian assistance). In contrast to coping strategies, adaptive strategies are used to manage the impacts of a shock/stressor and improve the long-term vulnerability, health, wealth, and wellbeing of individuals, households, and communities. Findings on women's empowerment are organized as relational, personal, environmental, and composite (overall) empowerment. Personal empowerment includes self-confidence, economic activity, non-acceptance of gender-based violence (GBV), individual knowledge, individual capacity, and personal autonomy. Relational empowerment includes group participation, household asset control, household decision-making, income control, and time allocation. Environmental empowerment includes experience of GBV, safety of movement, and stereotypes in the community. Structural equation models were constructed to explore associations among women's empowerment, training, and food security.

The 2017 assessment was conducted during the drought in Somalia, in which 6.7 million people in Somalia experienced acute food insecurity. This report provides a deeper understanding of the real-time effects of and responses and adaptations to the crisis, as well as recommendations for future program development.

A. Key Findings

Training and drought impact on food security
- When the cumulative number of training courses is taken into account, overall drought impact on food security tended to decrease. Training in health and nutrition, community and/or disaster leadership, water resource management, entrepreneurship, conflict resolution, and/or early warning training was associated more with reduced food insecurity.

- The drought had a significantly higher average impact on food in Baidoa than in Belet Hawa across all training types. This is not surprising given the fact that Baidoa and Afgooye are more rural and agriculture-dependent than Belet Hawa.

Training and coping
- The most common reactive coping strategies were the sale of productive assets including farming land (51.8 percent), breeding stock (37.5 percent) and draught animals (48.1 percent). The most common proactive coping strategies included out-migration to look for food or work (43.2 percent), borrowing money (44.6 percent) and borrowing other assets (31.1 percent).

- Training consistently positively correlated with adoption of proactive coping strategies, and most of the associations were statistically significant. In contrast, although there was a positive and significant association overall between attending training and adopting reactive coping strategies, the direction was not always the same across individual training programs. Only one training program (natural resource management) was significantly associated with adoption of reactive coping strategies.

Training and adaptation
- Each additional training was predicted to elicit a slight but insignificant increase in the average level of adaptation. Only training in water resource management and natural resource management led to a significantly higher average level of adaptation for participants than for those who did not take the training.

- Each additional training course significantly increased the average number of preparation steps. When training types are considered individually, health and nutrition, community and/or disaster leadership, disaster risk management, conflict resolution, and early warning training were most associated with drought preparations on average.

Women's empowerment
- While the composite women's empowerment index was not significantly associated with proactive coping, the sub-components of relational and environmental empowerment increased the use of proactive coping.

- However, the composite empowerment index had a significant negative association with the use of reactive coping strategies. This implies that overall, the higher a woman's level of empowerment, the less likely she is to apply negative coping strategies. Women's personal and relational empowerment have a direct and positive association with food security (i.e., negative association with drought impact on food security, but not significant for personal empowerment).

- Women's environmental empowerment has no direct association with food security but a positive and significant association with training (unlike personal and relational empowerment, which have a significant and positive association with food security (negative association with drought impact on food security).

Correlation between training, women's empowerment, and food security
- Structural equation models show that Women's environmental empowerment has a positive and significant association with training, which in turn has a significant and positive association with food security (i.e. a negative association with drought impact on food security).

- Women's personal and relational empowerment have a direct and positive association with food security (i.e., negative association with drought impact on food security).

B. Conclusions and Recommendations

These findings are consistent with programmatic adjustments made by PROGRESS staff following initial qualitative resilience assessments. Adjustments included overlapping training and group membership opportunities to strengthen larger networks and encourage multi-level interventions and increasing the role of women as peer counselors and outreach workers to facilitate broader participation not only in training, but also in civic and advocacy roles. The findings emphasize the importance of social capital and training in driving drought adaptation, consistent with earlier programmatic improvements. These program interventions should continue in the future.

Baidoa and Afgooye are more rural and agriculture dependent and score lower on women's empowerment, wealth, and education than Belet Hawa, which is more urban with better access to social services. This points to the need to continue tailoring interventions to agro-ecological and socio-economic differences.

The study found that drought and its profound impacts can be reduced through effective preparedness developed through capacity building. The research team believes that training topics with the greatest association with reduced drought impact are those that communities find most relevant, such as health and nutrition, water resource management, natural resource management, conflict resolution and disaster risk management (DRM). These themes should receive more emphasis in future programming.

Lessons from training associated with reduced drought impacts on food security, which exposes participants to strategies for dealing with drought impacts, have more direct and immediate application than training that requires "incubation." Training in topics such as management of water resources has a higher priority than training in coping with drought shock, and communities can easily and immediately apply the lessons from such training.

II. Background

The Program to Enhance Resilience in Somalia (PROGRESS) is a USAID- funded effort led by Catholic Relief Services (CRS) to work with local and international partners to strengthen resilience and build capacities to mitigate and prevent crises in Somalia. Recurrent drought and governance uncertainty contribute to chronic vulnerability among communities in Somalia that may be addressed through resilience-building activities and initiatives. In this report, "resilience" refers to the potential of individuals and communities to "bounce back better" from adverse circumstances. It is defined as the process of harnessing key resources to sustain wellbeing (Panter-Brick and Leckman 2013) and is a multi-dimensional process rather than a specific, solitary outcome (GW/IDFR 2016).

PROGRESS works to increase resilience in 16,000 Somali households in the South/Central communities of Afgooye, Baidoa, and Belet Hawa districts, which are prone to recurrent shocks. PROGRESS partners are CRS, Benadir University's Somali Disaster Resilience Institute (BU/SDRI), and the George Washington University's Institute for Disaster and Fragility Resilience (GW/IDFR), as well as local in organizations involved with the target communities. Collectively, PROGRESS partners seek to:

1. Increase the institutional capacity of target communities to adapt to shocks and stressors;

2. Increase the capacity of male and female members of 16,000 households to adapt to economic, nutritional, ecological, and social shocks; and

3. Enhance the resilience learning of communities, implementers, USAID, and others.

PROGRESS partners prioritize the use of evidence-based approaches to develop and implement programs that enhance resilience. This report aims to 1) provide humanitarian and development actors with deeper knowledge of resilience in Somali households, 2) help build PROGRESS programmatic capacity to apply resilience research and community capacity in leadership, and 3) identify areas for knowledge exchange and sharing of resilience learning across multiple partners and stakeholders.

III. Methodology

PROGRESS uses a Resilience Analytical Framework that involves a multi-step process of engagement and application. The Framework employs an empirically driven process to create locally relevant indicators of resilience in the contexts of targeted communities. The steps of inquiry include qualitative contextual analysis, pilot quantitative assessment, and quantitative analysis, described below:

A. Qualitative Analysis

The process begins with establishing the context, identifying and exploring resilience priorities through literature reviews, interviews, focus groups, and quasi-statistics. The qualitative analysis conducted in 2015 presented and discussed 53 *resilience factors* that were identified through Participatory Disaster Resilience Assessments (PDRAs) and focus group discussions (FGDs). These factors were narrowed through stakeholder surveys with PROGRESS program staff and BU/SDRI community engagement and research specialists. The results led to the identification of 21 core resilience factors for the targeted communities, organized by nine clusters and previously called *resilience dimensions* (building on the work of the USAID-funded ResilientAfrica Network in 2015). IDFR and BU/SDRI convened a workshop in Kampala, Uganda, to validate the resilience factors and create a joint protocol for community engagement. Together, they established a system to validate the relevance of the factors using a quasi-statistic data collection method based on Community Score Card techniques.

B. Pilot Quantitative Analysis

A quantitative survey was piloted in Baidoa to build on the qualitative findings from the three PROGRESS regions and specifically to understand the interaction of resilience priorities. The pilot illustrated significant relationships between capacity building in the form of training for women and improved food security, as well as a strong indication that empowerment was a protective factor against symptoms of depression and anxiety for women. The findings of the Baidoa study inspired PROGRESS staff to engage with data and hold detailed discussions of community needs that informed programming.

To create a contextualized survey, the qualitative findings informed specific hypotheses on the role of women in targeted Somali communities to guide the data collection and analysis. These hypotheses were developed conjointly with BU/SDRI and GW/IDFR. The pilot survey was designed to include all of the information contained in the hypotheses and theoretical models . The research team chose to use the Women's Empowerment Agricultural Index (WEAI) in the initial pilot survey to measure women's resilience within targeted households.

FIGURE 1. PRIORITIZED AND VALIDATED RESILIENCE FACTORS
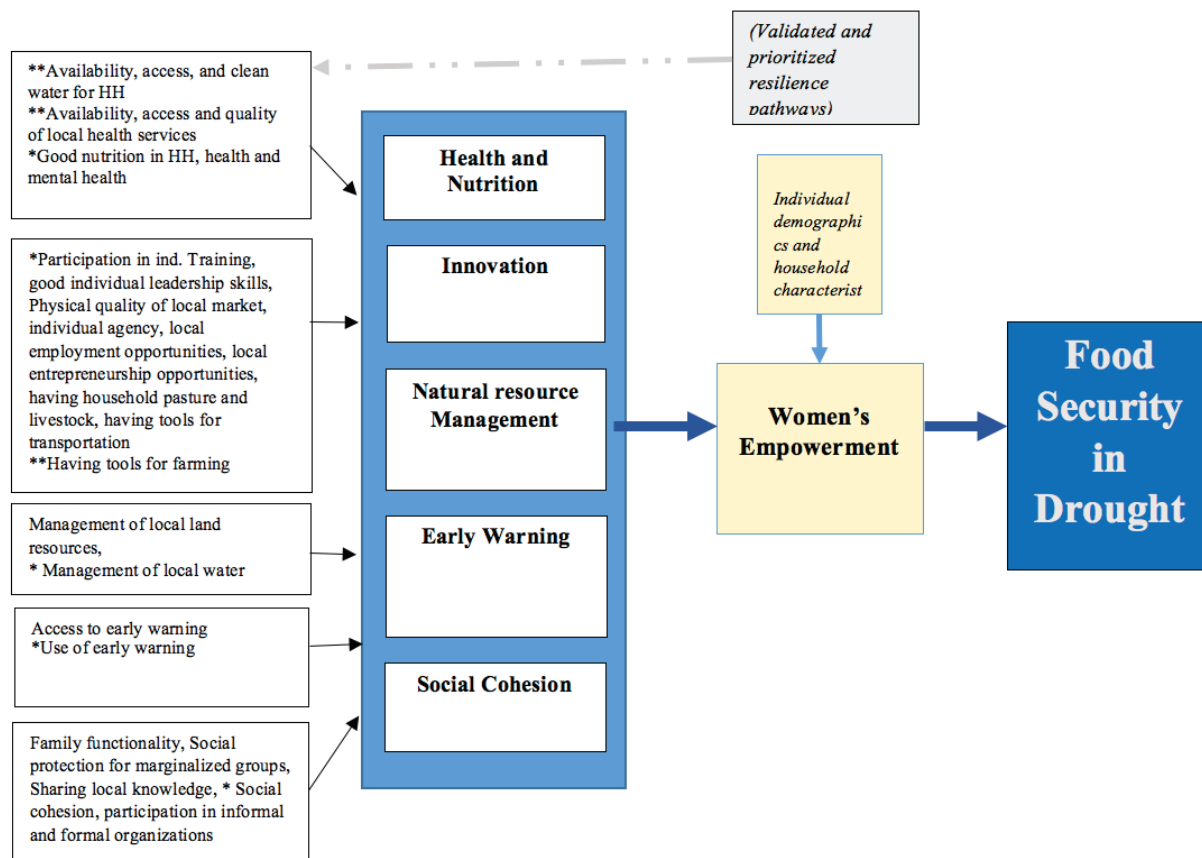
The researchers explored associations between women's empowerment and areas of relevance for PROGRESS programming. In the initial quantitative findings, it was evident that the role of women was related to food security in the targeted households. Researchers were interested in how food security is enhanced through a variety of factors that could be strengthened through programmatic efforts. To better determine pathway relationships between variables, food security was used as a dependent variable for regression structural equation analysis. Questions from a food hunger scale were used to measure food security within households in the Baidoa survey. All factors were analyzed, and the relationships that were found were presented in a "pathway" model (GW/IDFR et al., 2016). In this initial pilot work in Baidoa, three pathways were identified (**figure 1**). Based on the learning from the pilot data, PROGRESS was able to tailor training programs to enhance women's involvement, particularly in areas relevant to food security. To further inform these training initiatives, the survey data were analyzed by type of training to roughly estimate which training activities were most strongly associated with higher household food security.

C. Quantitative Analysis

In the third step of the framework, the theoretical model was used to create context-specific indicators, and quantitative data were collected and analyzed. Continual knowledge exchange through stakeholder engagement and partnership collaboration informed each step of this process. This report focuses on this third step. The methods and findings are discussed in the preceding sections. The analysis draws on data from the three districts to test relationships among training, women's empowerment, and improved food security.

D. Survey Methodology

Twenty-six villages in the three districts of Afgooye, Baidoa, and Belet Hawa were purposely pre-selected for this survey. The villages contained 6,777 households, with an average of 261 households per village (from 89 in Haroodi in Belet Hawa District to 1,290 in Awidinle in Baidoa District (**table 1**).

TABLE 1. POPULATION INFORMATION AND SELECT VILLAGES FOR DATA COLLECTION

No.	District	Village	Household size
1	Afgooye	Sagalaad	842
2	Afgooye	Bagdad	320
3	Afgooye	Buhow	266
4	Afgooye	Mareerey	398
5	Afgooye	Buri	139
6	Afgooye	Bulalow	337
7	Afgooye	Donka	451
8	Afgooye	Bulla Madina	100
9	Afgooye	Balow	334
10	Baidoa	Awidinle	1,290
11	Baidoa	Bad ade	184
12	Baidoa	Aliomumin	110
13	Baidoa	Miidow	155
14	Baidoa	Bonkay	191
15	Baidoa	Reebay	122
16	Baidoa	Misgale	258
17	Belet Hawa	Arabo	110
18	Belet Hawa	Beled Amin	250
19	Belet Hawa	Fulayle	90
20	Belet Hawa	Gawiido	140
21	Belet Hawa	Haroodi	89
22	Belet Hawa	Jiracle	166
23	Belet Hawa	Malkariye	100
24	Belet Hawa	Oda	100
25	Belet Hawa	Unsi	145
26	Belet Hawa	Warcadey	90
	Total		**6,777**

E. Sampling

A two-stage sampling method was used to select 600 households to participate in the survey. In the first stage, probability proportional to size was used to select 10 clusters from the 26 villages. Specifically, nine villages were selected for the survey, with two clusters in Awidinle and one cluster in each of the other eight villages. Four villages, Buhow, Bulalow, Donka, and Sagaland were selected from Afgove District. Three villages, Aliomumin, Awidinle, and Misgale, were selected from Baidoa District; and two villages, Gawiido and Warcadey, were selected from Belet Hawa District.

In the second stage, a random sample of 60 households was selected from a list of all households in each cluster. One hundred twenty households (two clusters) were selected from the village Awidinle and 60 households from each of the other eight villages. In total, 600 households were selected for this survey, with 240 households from District Baidoa and District Afgooye, and 120 households from District Belet Hawa. In each of the selected household, the wife of a household head or a female household head is selected for a face-to-face interview.

IV. Findings

This section summarizes the findings of the quantitative analysis. As discussed in the methodology section, preliminary resilience studies (CRS/IDFR, 2016) have indicated the potential role of training and women's empowerment in strengthening resilience to drought.

Section A discusses the relationships between training and several resilience aspects. These resilience aspects include extent of drought impacts on food security (A1), application of coping strategies (reactive and proactive)(A2), drought preparation (A2.2), and adaptation (A3).

Section B discusses findings on women's empowerment, socio economic indicators (wealth, education, occupation and access to basic services) and comparisons across the Baidowa, Belet Hawa and Afgooye regions. The associations between women's empowerment and application of coping strategies (proactive and reactive) are discussed as well.

Section C explores pathways among women's empowerment, types of training and food security using structural equation models.

A1. Training and drought impact on food security

The study sought to understand factors that had strong or weak correlation with the extent of drought impacts on food, drought preparation, and adaptation. Training is one of the factors that had a significant correlation with drought impacts on food, preparation, and adaptation. As shown in **table 2**, respondents received training in a wide range of themes, the most common of which were health and nutrition, natural resource management, water resource management, conflict resolution, and disaster risk management (DRM). The study revealed that drought and its profound impacts can be reduced through effective preparedness developed through capacity building. It appears that the training shown to have the greatest correlation with reduced drought impact is training in topics that communities find most relevant, such as health and nutrition, water resource management, natural resource management, conflict resolution, and DRM. Such themes need to be given more emphasis in future programming.

TABLE 2. PARTICIPATION IN TRAINING PROGRAMS, BY PERCENTAGE

Training	Percentage
Health and nutrition	40.8
Community and/or disaster leadership	33.7
Savings and loan	30
Disaster risk management	35.2
Natural resource management	35.7
Water resource management	42.6
Entrepreneurship	22.4
Conflict resolution	35.5
Early warning	30
Vocational, technical	20
Gender-based violence GBV	29.6
Agriculture/food security	32.3

Effects of the 2017 Drought

The 2017 PROGRESS resilience quantitative assessment was conducted in the middle of a complex emergency, with 6.7 million people in Somalia experiencing acute food insecurity.[1] Since November 2016, an estimated 766,000 people in Somalia have been displaced by the effects of drought, as well as humanitarian access constraints in areas controlled by the al-Shabaab armed group, the UN reports[2]. As such, the 2017 survey reveals a greater percentage of households experiencing food insecurity compared to the 2016 survey (**figure 2**).

FIGURE 2. FOOD SECURITY BEFORE AND DURING THE DROUGHT
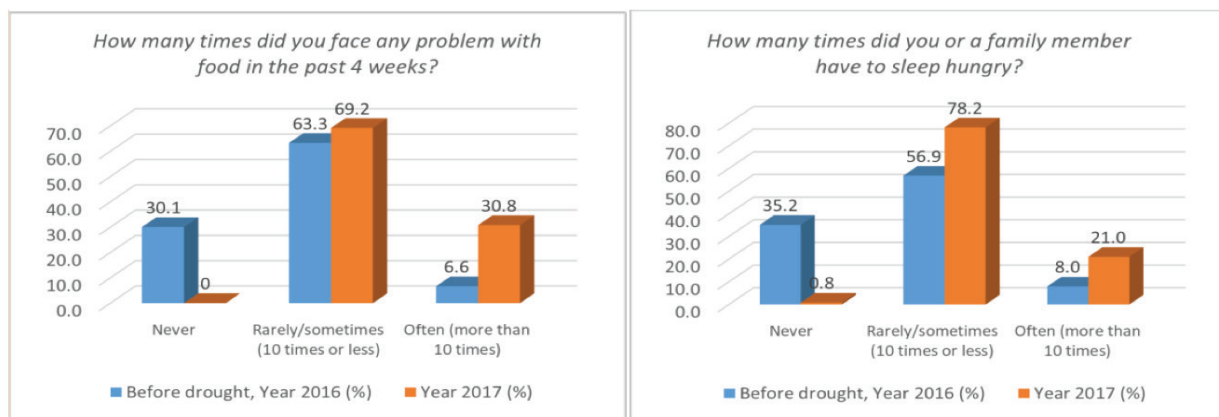
Therefore, the data collated from this study provide an in-depth understanding not only of the impacts of the drought, but also of the coping and adaptation of households and communities in real time. The data also provide a better understanding of drivers of adaptation, as they were collected during the crisis.

Training and Overall Drought Impact on Food security

Analysis highlighted below shows that training to have a strong association with reduced drought impacts on food security. **Table 3** shows the average impact of training on drought impact on food security, with the dependent variable rated on a scale from 1 to 5, where 1 is very little impact and 5 is very high impact on food scarcity, choices, and nutrition.

TABLE 3. DROUGHT IMPACT ON FOOD BY TRAINING (CONTROLLING FOR DISTRICT AND EMPLOYMENT)

Type of training	No training	Training
Overall training (average no. of training courses received)	4.316	4.282**
Health and nutrition	4.313	4.082**
Community and/or disaster leadership	4.311	4.019**
Natural resource management	4.073	4.222*
Conflict resolution	4.366	3.867**
Early warning	4.300	3.947**

* $p<.05$, ** $p < .01$, N.S = not statistically significant.

In this table, the numbers refer to households in which there was a farmer in Belet Hawa District, but the trends related to training held true across districts and types of employment. This table shows that when the cumulative number of training courses is taken into account, participation in an additional training program will decrease the impact of drought on food insecurity by 0.034 points on a scale of 1 to 5. When training types are considered individually, participation in training in health and nutrition, community and/or disaster leadership, water resource management, entrepreneurship, conflict resolution, and/or early warning led to drought having significantly less impact on food on average than not participating in this training. While participating in GBV and DRM training would also be predicted to have lower impact on food than not

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1 USAID (2017). Horn of Africa–Complex Emergency. Fact Sheet #8, Fiscal Year (FY) 2017 August 3, 2017.

2 Ibid.

participant, these predicted differences were not significant. Additionally, agriculture/food security, vocational/technical, savings and loans, and natural resource management training all worked against expectations and showed increased food impacts on average than those who had not taken these training, though only those with Natural Resource Management showed a significant average increase on food impacts.

Researchers believe that training shown to be associated with reduced drought impacts on food security exposes participants to strategies for dealing with drought impacts. Such training has more direct and immediate application than training that requires "incubation." For example, training in agriculture might be relevant for food security, but during drought, its relevance may be undermined by the scarcity of water. The study showed that training in topics such as management of water resources is more relevant for coping with drought shock and that communities can easily and immediately apply the lessons from such training.

A2. Training and coping

A2.1. Coping (Proactive and Reactive) and Adaptive Strategies

The term "coping strategies" refers to approaches used by households and communities to manage the impacts of a shock/stressor (such as drought) that either have negative impact on resilience (eroding resilience) or lead to no net improvement in resilience). I.e. coping that does not improve or worsens the vulnerability, health, wealth, and wellbeing of individuals, households, and communities.[34]

The 2017 study differentiated between reactive and proactive coping strategies applied by households. Reactive coping strategies (e.g., sale of farming land, breeding stock, draught animals, milking animals, farm implements, and household valuables) may provide short-term relief but ultimately have more corrosive effects than the proactive strategies (e.g., out-migration to look for food or work, borrowing money, borrowing other assets, and receiving humanitarian assistance). As shown in **table 4**, the most common reactive coping strategies included the sale of productive assets like farming land (51.8 percent), breeding stock (37.5 percent), and draught animals (48.1 percent). Communities commonly consider livestock an asset they can easily dispose of in exchange for food when there is a shortage. Land sale is a rare practice, and it is surprising that land sale is cited so frequently. This may indicate the severity of the crisis as well as a rising interest in land.

TABLE 4. ADOPTION OF PROACTIVE AND REACTIVE COPING STRATEGIES, BY PERCENTAGE

Coping strategies	Percentage
Reactive coping	
Sold farming land	51.8
Sold breeding stock	37.5
Sold draught animals	48.1
Sold milking animals	24.6
Sold farm implements	30.5
Sold household valuables	29.6
Proactive coping	
Out-migrated to look for food or work	43.2
Borrowed money	44.6
Borrowed other assets	31.1
Received humanitarian assistance	25.0

The most common proactive coping strategies included out-migration to look for food or work (43.2 percent), borrowing money (44.6 percent), and borrowing other assets (31.1 percent). Migration is often applied in combination with other strategies such as accessing financial and other assets through social networks. Borrowing money to cope with disaster shocks is a common strategy, but it is closely linked to remittances from diaspora relatives, which is also another key livelihood strategy for most homes. For example, while waiting for remittances, families borrow money, food, or other assets as a common short-term strategy. While migration is traditionally linked to a pastoralist livelihood, when food and employment opportunities are limited, out-migration increases as a coping strategy to adapt to the shocks.

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3   ResilientAfrica Network-RAN, Dimension Lexicon, 2015 (unpublished).

4   RAN considers the term "coping strategies" to encompasses many of aspects of terms such as: Negative coping, negative adaptive strategies, Unsustainable coping strategies, and absorptive capacity.

Table 5 shows that proactive coping strategies considered in the analysis included out-migration to look for food or work, borrowing money, borrowing other assets, and receiving humanitarian assistance. Reactive coping strategies included selling farming land, breeding stock, draught animals, milking animals, farm implements, and household valuables

Table 5. Average number of coping strategies by training type (controlling for district and employment)

Type of training	Proactive coping strategies		Reactive coping strategies	
	Training	**No training**	**Training**	**No training**
Overall training	1.391**	1.226	2.675*	2.617
Health and nutrition	1.654*	1.338	2.63	2.897
Community and/or disaster leadership	1.60*	1.347	2.961	2.702
Savings and loans	1.491	1.406	2.825	2.851
Disaster risk management	1.691*	1.327	2.926	2.703
Natural resource management	1.557	1.324	2.983*	2.607
Water resource management	1.548	1.325	2.919	2.65
Entrepreneurship	1.717*	1.367	2.53	2.884
Conflict resolution	1.703*	1.33	2.963	2.729
Early warning	1.69*	1.374	2.964	2.753
Vocational/technical	1.561	1.443	2.625	2.808
Gender-based violence	1.875**	1.396	2.849	2.797
Agriculture/food security	1.727**	1.403	2.6	2.839

* $p<.05$, ** $p < .01$, N.S = not statistically significant.

It is worth noting that training is always positively correlated with adoption of proactive coping strategies, and most of the associations are statistically significant. In contrast, although overall there is a positive and significant association between attending training and adopting reactive coping strategies, the direction is not always the same across individual training programs. Only one training program (natural resource management) is significantly associated with adoption of reactive coping strategies. The proactive and reactive coping strategies are rarely applied simultaneously. A balanced application of these strategies needs to be encouraged. There are critical elements of natural resource management training that communities perceive as exacerbating drought if not managed properly, such as control of charcoal production, climate change, and water shortages. Also, natural resource management training represents a bottom-up approach in which communities are collectively trained to address natural resource concerns.

A2.2. Training and Drought Preparation

Table 6 shows the average number of activities to prepare for the drought carried out by people who did or did not participate in various types of training, in a range from 0 to 10, controlling for district and occupational status.

TABLE 6. AVERAGE NUMBER OF DROUGHT PREPARATIONS BY TYPE OF TRAINING (CONTROLLING FOR DISTRICT AND EMPLOYMENT)

Type of training	No training	Training
Overall training	3.050	3.083*
Health and nutrition	3.046	3.371**
Community and/or disaster leadership	3.042	3.467**
Savings and loans	3.283	2.878**
Disaster risk management	2.999	3.395**
Natural resource management	3.169	3.272
Water resource management	3.205	3.277
Entrepreneurship	3.219	3.285
Conflict resolution	3.115	3.393*
Early warning	3.147	3.399*
Gender-based violence	3.250	3.198*

* $p<.05$, ** $p < .01$, N.S = not statistically significant.

This table shows that each additional training is expected to significantly increase the average number of preparation steps taken. When training types are considered individually, participating in training in health and nutrition, community and/or disaster leadership, DRM, conflict resolution, and/or early warning led to more preparation on average than not participating. While participants in water resource management, natural resource management, and entrepreneurship training would also be predicted to take more preparatory steps than those who did not participate, these predicted differences were not significant. Additionally, those who participated in agriculture/food security, GBV, vocational/technical, and savings and loans training made fewer preparations on average than those who did not participate, although this decrease in preparation was only significant for savings and loans training.

Again, the findings highlight the difference between training in topics such as health and nutrition that can be applied immediately for drought adaptation and training that builds capacity for the long term. For example, while savings and loans, GBV, and vocational/technical training are important, their relevance to protecting the livelihoods of the study communities did not show much short-term direct correlation with drought preparedness. For example, vocational/technical and savings and loans training might help communities in general pursue self-employment opportunities, with the limited purchasing power of the local economies at the time of the drought, such training did not support communities to develop quick skills for drought preparedness. Also, while most savings and loans are made through community and social networks, limited access to formal financial services discourages communities from considering training in savings and loans as part of a wider range of coping strategies available for drought preparedness.

A3. Training and adaptation

In contrast to coping strategies, "adaptive strategies" are used to manage the impacts of a shock/stressor and have a positive effect on individual, household, or community resilience, that is, they improve the long-term vulnerability, health, wealth, and wellbeing of individuals, households, and communities (RAN 2015).

Respondents provided information on their use of the following agricultural adaptation strategies to mitigate drought impacts: *Changing the crop calendar, changing to less water-consuming crops, keeping land unsown after the possibility of drought, changing traditional irrigation practices to sprinkler or drip irrigation, harvesting water through farm ponds, using conservation practices, and saving water by reducing wastage during a drought year*. **Table 7** shows the average rate of drought adaptation ranging from 1 (very low) to 5 (very high).

TABLE 7. AVERAGE RATE OF DROUGHT ADAPTATION BY TRAINING (CONTROLLING FOR DISTRICT AND EMPLOYMENT)

Type of training	No training	Training
Overall training	4.218	4.247*
Health and nutrition	4.183	4.418
Community and/or disaster leadership	4.248	4.390
Disaster risk management	4.216	4.382
Natural resource management	3.992	4.453**
Water resource management	4.053	4.418**
Entrepreneurship	4.316	4.320
Vocational/technical	4.282	4.469
Agriculture/food security	4.385	4.405

* $p<.05$, ** $p < .01$, N.S = not statistically significant.

This table shows that each additional training course was predicted to result in a slight but insignificant increase in the average level of adaptation. When training types are considered individually, water resource management and natural resource management were the only types of training that led to a significantly increased average level of adaptation for those who participated, compared to those who did not take these training courses. While those who participated in health and nutrition, community and/or disaster leadership, DRM, vocational/technical, agriculture/food security, and entrepreneurship training would also be predicted to have higher adaptation levels on average than those who did not attend these training courses, these predicted differences were not significant. Additionally, those who participated in GBV, early warning, conflict resolution, and savings and loans training showed significantly decreased levels of adaptation on average than those who did not participate.

The traditional understanding is that drought is directly related to natural resource and water. Therefore, most respondents focus on addressing these elements as key drought adaptation strategies. In addition, the application of natural resource and water management can be community-driven and community-based strategies that can start at the household level, while application of other training topics such as GBV, with its cultural sensitiveness, might require external input to be effectively implemented. Another implication of training in GBV, early warning, conflict resolution, and saving and loans is that that communities are not able to recover costs involved in applying the skills from such training . For example, as part of early warning training, destocking is advised to prepare for drought. However, after the sale of the animals, people have limited knowledge and options to invest the cash in other opportunities. This creates a situation where the community members might consume the cash and run out of money to buy again animals to keep for living. Another implication is that the skills acquired from these types of training do not directly support food, pasture, and water security at household level.

B. Women's Empowerment

Data were also collected on the status of women's empowerment. It is widely agreed that women's empowerment is positively associated with household wellbeing and resilience. For example, UN Women et al. (2015) reported that increasing women's access to agricultural productivity resources (to parity with men's access) could lift as many as 238,000 people in Malawi, 80,000 in Tanzania, and 119,000 in Uganda out of poverty.

This study analyzes the association among women's empowerment, food security, and adaptation. Four women's empowerment indices were created (**table 8**). The overall (composite) women's empowerment index includes three factors: personal empowerment, relational empowerment, and environmental empowerment. Personal empowerment includes self-confidence, economic role, non-acceptance of GBV, individual knowledge, individual capacity, and personal autonomy (scores range from 0 to .8). Relational empowerment includes group participation, household asset control, household decision-making, income control, and time allocation (scores range from 0 to1). Environmental empowerment includes experience of GBV, safety of movement, and stereotypes in the community (scores range from 0 to 1). Each individual component (e.g., self-confidence) is coded as a dichotomous measure, and the indexes of women's empowerment and its three sub-dimensions are calculated as an average of included individual components.

TABLE 8. DESCRIPTIVE STATISTICS FOR WOMEN'S EMPOWERMENT INDEX

Index	Mean	Median	Standard deviation	Minimum	Maximum
Women's empowerment	0.350	0.333	0.145	0.000	0.769
Personal	0.300	0.333	0.189	0.000	0.833
Relational	0.224	0.250	0.255	0.000	1.000
Environmental	0.534	0.583	0.307	0.000	1.000

B1. Extent of Women's Empowerment and Demographic/Economic Indicators by District

Figure 3 shows that Belethawa District had higher scores for women's empowerment, average age, education, and wealth than Afgooye and Baidoa districts.[5] Yet Baidoa and Afgooye had a much higher score than Belethawa for the percentage of farmers. This seems to suggest that communities that depend more on agriculture were more vulnerable and more affected by the drought. Baidoa and Afgooye are more rural, agriculture dependent, and adherent to traditional cultural practices than Belethawa, which is closer to an urban setting (Mandera County of Kenya) and has better access to cross-border urban amenities in Kenya and Somalia. Baidoa and Afgooye communities are therefore more vulnerable to drought. These findings suggest the need for more targeted interventions taking into consideration the social and economic differences in these regions.

**FIGURE 3**. WOMEN'S EMPOWERMENT AND DEMOGRAPHIC/ECONOMIC INDICATORS, BY DISTRICT
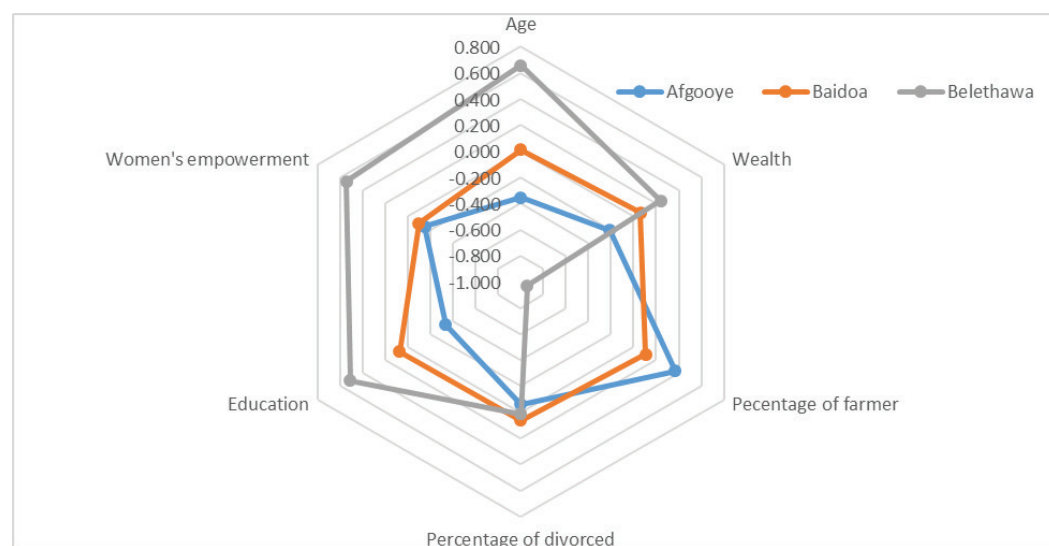
5   Note: Each variable is standardized. A positive number indicates a score above the average, and a negative one indicates a score below the average. For example, Belethawa respondents reported the highest average age, the highest level of women's empowerment, the highest level of education, the highest level of wealth, the lowest percentage of farmers, and a similar level of diveroce rate as the two other districts.

B2. Women's Empowerment and Other Resilience Factors

Figure 4 shows that Belethawa District had higher scores for women's empowerment, as well as access to water and services, than Afgooye and Baidoa districts, but lower scores on access to training, community basic services, and drought impact on food security. Afgooye scored lower on most of the resilience factors in the model except for access to water and sanitation. Ironically, while Baidoa was shown to have high access to training and community basic services, it scored low on women's empowerment and had a high drought impact on food security. The differences between Baidoa and Belet Hawa could be attributed to their location, access to social amenities, and presence of the international development agencies. Baidoa is located in southern Somalia, with agriculture-based livelihood, and has a number of international nongovernmental organizations because of its strategic location, which also explains the high number of training and community-based services. However, the community is more attached to traditional cultural practices than to Belethawa, which is in a more urban setting with more egalitarian gender norms—hence the high women empowerment indices.

FIGURE 4: WOMEN'S EMPOWERMENT AND OTHER RESILIENCE FACTORS
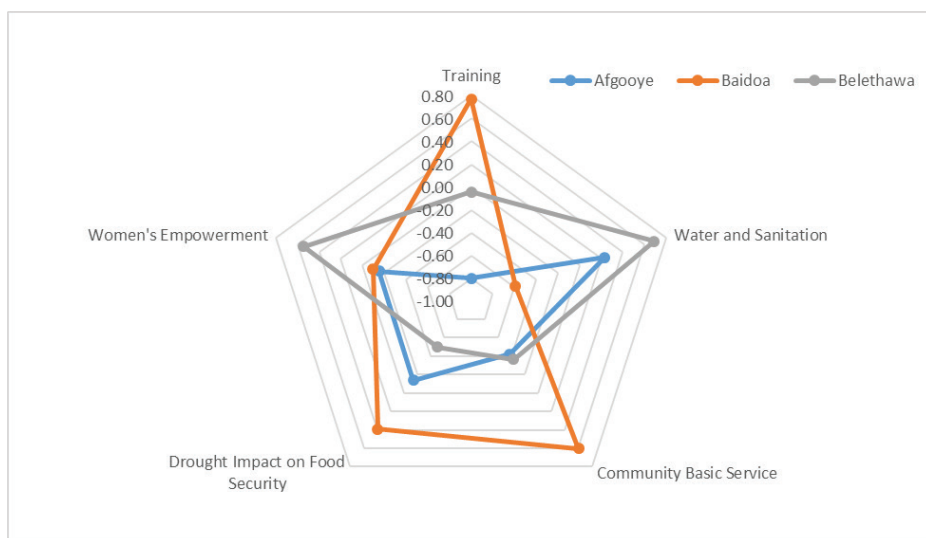
This analysis implies a positive relationship between women's empowerment and food security. That is, while Belet Hawa had a lower preponderance of training, it had a higher women's empowerment score and lower preponderance of drought impacts on food security. Does women's empowerment lead to lower drought impacts on food security? This question is explored using structural equation modeling later in this report.

B3. Relationship between Women's Empowerment and Coping Strategies

The previous section discussed resilience factors, including women's empowerment. This section focuses on women's empowerment and how well it predicts coping. A number of linear regression models were constructed to investigate the associations between women's empowerment and proactive and reactive coping strategies, controlling for district and a series of demographic and socioeconomic factors. **Table 9** (model 1) shows that the composite women's empowerment index did not have a significant effect on proactive coping strategies. It is more instructive to unpack the index into the three sub-components. Model 2 shows that the personal empowerment index had a negative association with the use of proactive coping strategies. On the other hand, relational and environmental empowerment increased the use of proactive coping.

TABLE 9. WOMEN'S EMPOWERMENT PREDICTING PROACTIVE COPING STRATEGIES

Factor	Model 1			Model 2		
	Unstandardized coefficients	Standardized coefficients	Sig.	Unstandardized coefficients	Standardized coefficients	Sig.
	B	Beta		B	Beta	
Intercept	1.197		0	0.946		0
Women's empowerment	0.043	0.004	0.903			
Personal empowerment				-0.5	–0.057	0.06

Factor	Model 1			Model 2		
	Unstandardized coefficients	Standardized coefficients	Sig.	Unstandardized coefficients	Standardized coefficients	Sig.
	B	Beta		B	Beta	
Relational empowerment				0.54	0.082	0.011
Environmental empowerment				0.514	0.094	0.014
Afgooye	–1.183	–0.349	0	–1.056	–0.313	0
Baudia	1.594	0.459	0	1.606	0.468	0
Farmer	0.319	0.095	0.013	0.244	0.074	0.055
Husband as farmer	0.202	0.06	0.122	0.223	0.067	0.078
Wealth	0.166	0.049	0.142	0.165	0.049	0.132
Age	0.07	0.06	0.067	0.06	0.052	0.104
Not married	0.364	0.029	0.329	0.435	0.034	0.234
Widowed	-0.166	-0.027	0.381	-0.198	-0.033	0.29
Divorced	-0.21	-0.025	0.408	-0.253	-0.032	0.288

Table 10 (model 1) shows that the composite empowerment index has a significant negative association with the use of reactive coping strategies. This implies that overall, the higher a woman's level of empowerment, the less likely she is to apply negative coping strategies. However, the data do not reflect a significant relationship between the sub-components of personal, environmental, and relational empowerment and reactive coping.

TABLE 10. WOMEN'S EMPOWERMENT PREDICTING REACTIVE COPING STRATEGIES

Factor	Model 1			Model 2		
	Unstandardized coefficients	Standardized coefficients	Sig.	Unstandardized coefficients	Standardized coefficients	Sig.
	B	Beta		B	Beta	
Intercept	2.898		0	2.604		0
Women's empowerment	–1.179	–0.094	0.01			
Personal empowerment				-0.402	-0.042	0.249
Relational empowerment				-0.365	-0.051	0.179
Environmental empowerment				0.054	0.009	0.84
Afgooye	–2.227	–0.607	0	–2.107	–0.571	0
Baudia	-0.222	-0.059	0.297	-0.156	-0.042	0.482
Farmer	0.42	0.116	0.008	0.409	0.112	0.011
Husband as farmer	0.226	0.062	0.166	0.188	0.051	0.252
Wealth	0.708	0.205	0	0.669	0.193	0
Age	0.062	0.049	0.189	0.07	0.055	0.14
Not married	-0.299	-0.021	0.537	-0.317	-0.022	0.516
Widowed	-0.105	-0.015	0.668	-0.135	-0.02	0.584
Divorced	-0.569	-0.058	0.093	-0.414	-0.045	0.203

## C. Correlation between training, women's empowerment, and food security

The associations among women's empowerment, training, and food security were further explored in structural equation models. These pathway models examined how food security is enhanced through a variety of factors that could be strengthened through programmatic efforts. The models controlled for household wealth, whether a respondent was a farmer, whether her husband was a farmer, and region (the path coefficients of these variables are not presented in the graph). Standardized regression coefficients are presented in these models. All these structural equation models fit the data adequately based on fit indices such as chi-square score, Confirmatory Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA).

Figure 5 shows that women's personal and relational empowerment have a direct and positive association with food security (i.e., negative association with drought impact on food security, but not significant for personal empowerment). Women's environmental empowerment has no direct association with food security, but it has a positive and significant association with training (unlike personal and relational empowerment, which in turn has a significant and positive association with food security and negative association with drought impact on food security. A similar pattern is repeated when specific types of training are considered in the model, i.e., community and disaster leadership training in **figure 6**, conflict resolution training in **figure** 7, and early warning training in **figure 8**).
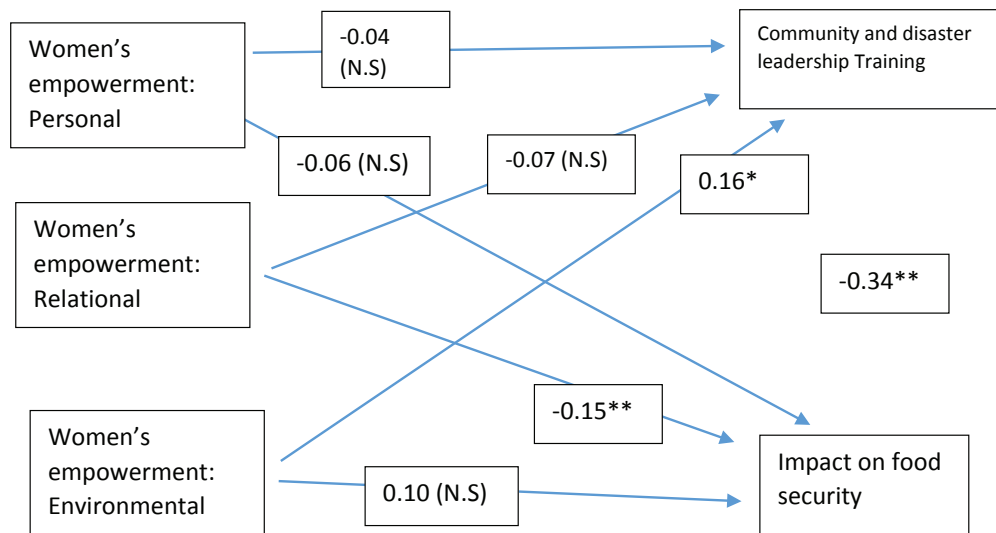
FIGURE 5. PATH MODEL 1: WOMEN'S EMPOWERMENT, TRAINING, AND DROUGHT IMPACT ON FOOD SECURITY
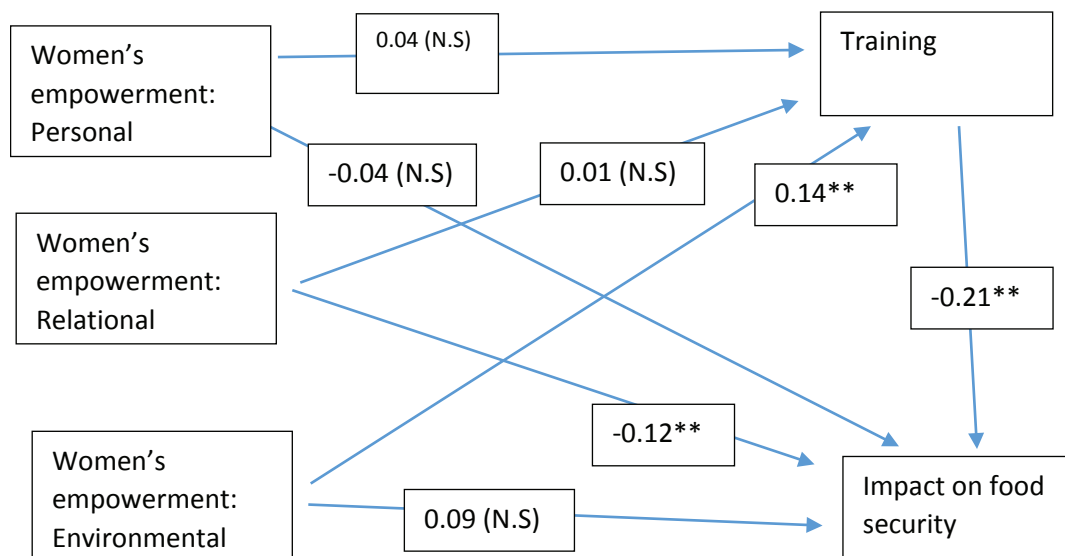
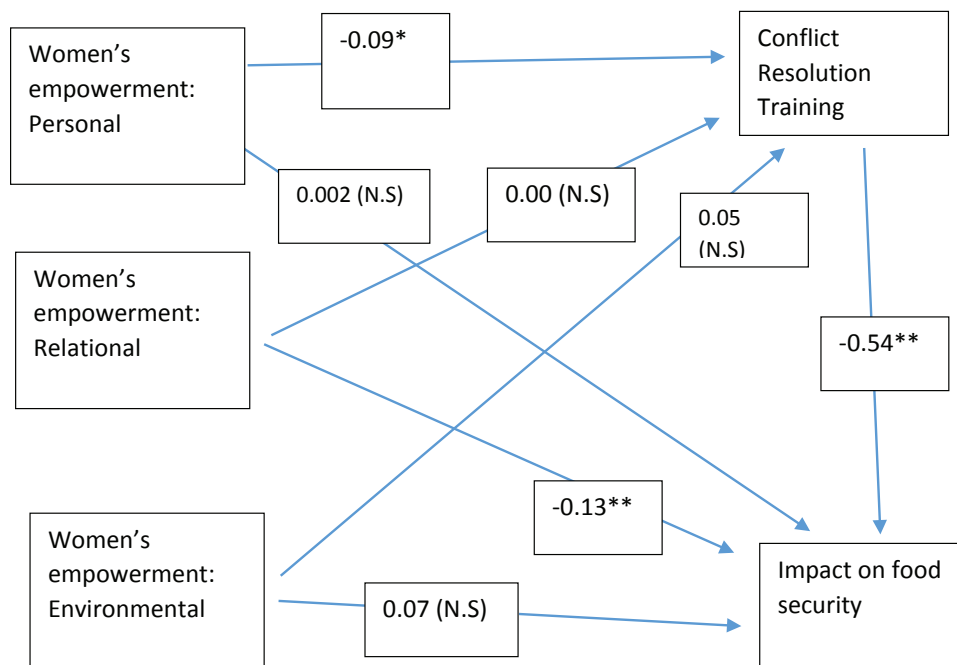* p<.05, ** p < .01, N.S = not statistically significant.

FIGURE 6. PATH MODEL 2: WOMEN'S EMPOWERMENT, COMMUNITY AND DISASTER LEADERSHIP TRAINING, AND DROUGHT IMPACT ON FOOD

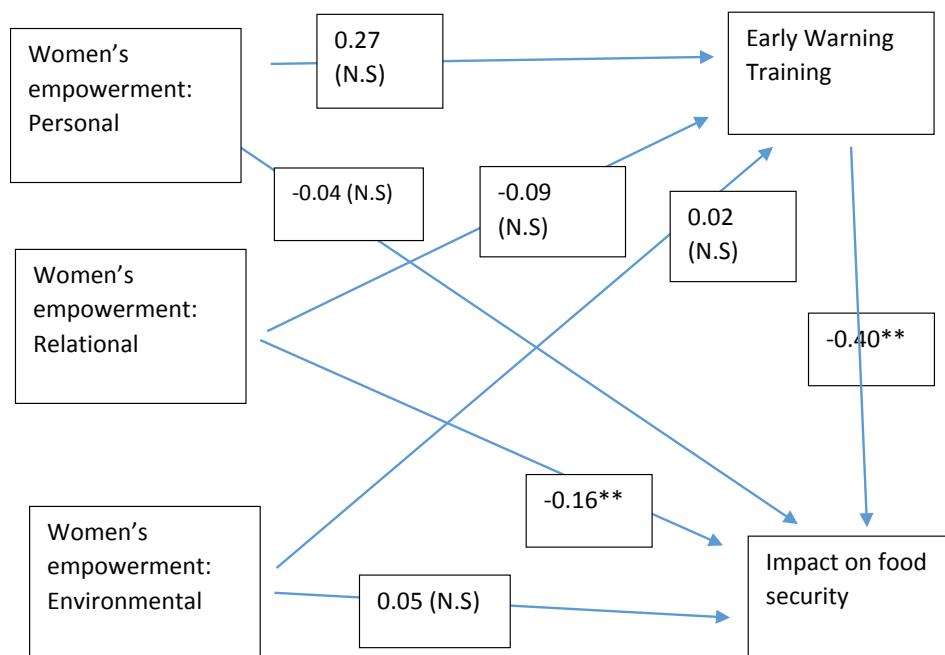

* p<.05, ** p < .01, N.S = not statistically significant.

FIGURE 7. PATH MODEL 3: IMPACT OF WOMEN'S EMPOWERMENT, CONFLICT RESOLUTION TRAINING, AND DROUGHT ON FOOD SECURITY

* p<.05, ** p < .01, N.S = not statistically significant.

FIGURE 8. PATH MODEL 4: IMPACT OF WOMEN'S EMPOWERMENT, EARLY WARNING TRAINING, AND DROUGHT ON FOOD

* p<.05, ** p < .01, N.S = not statistically significant.

V. Conclusions and Recommendations

This report highlights the findings of an assessment conducted during the 2017 drought crisis in Somali. As such, the data present higher magnitudes of drought impacts than those reported in earlier studies.

Baidoa and Afgooye are more rural and agriculture dependent and scored lower on women's empowerment, wealth, and education than Belet Hawa, which is more urban with better access to social services. This points to the need to continue tailoring interventions to agro-ecological and socio-economic differences.

This study continued to demonstrate the importance of social capital. Relational empowerment (unpack) has a significantly strong association with proactive coping and adaptation. Similarly, the 2016 resilience assessment demonstrated that membership in community organizations enhanced women's coping and adaptation. In addition to relational empowerment, training emerges as a very important driver of positive adaptation and proactive coping.

These findings are possibly the results of programmatic adjustments by program staff after initial qualitative resilience assessments. Following presentation of findings from the Baidoa study, PROGRESS staff had an opportunity to engage with data, which inspired detailed discussions on community needs and informed programming efforts. The programmatic enhancements included overlapping training and group membership opportunities to strengthen larger networks and encourage multi-level interventions and giving women roles as peer counselors and outreach workers to facilitate broader participation not only in training, but also in civic and advocacy roles. Therefore, the reiterated importance of social capital and training in driving drought adaptation is consistent with earlier programmatic improvements. It is recommended that these program interventions continue in the future.

The study found that drought and its profound impacts can be reduced through effective preparedness developed through capacity building. The research team believes that training in topics that communities find most relevant, such as health and nutrition, water resource management, natural resource management, conflict resolution, and DRM, has the greatest association with reduced drought impact. Such topics should be given more emphasis in future programming.

Researchers believe that the training shown to be associated with reduced drought impacts on food security exposes participants to strategies for dealing with drought impacts. Lessons from such training have more direct and immediate application than training that requires "incubation." For example, while training in agriculture might be relevant for food security, during a drought, the scarcity of water may undermine its relevance. The study showed that training in topics such as management of water resources has a higher priority than training in coping with drought shock, and communities can easily and immediately apply the lessons from such training.

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