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Market Access and Quality Critical for Food Security in Periods of Stress

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additional analysis from baseline and midline

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Executive Summary

This report reflects additional analysis done using the Feinstein research baseline[1] and midline data of a four-year study in a sample of Mercy Corps (MC) programming communities in Apolou, with a final data collection currently ongoing (December 2021/January 2022). This report specifically looks at the relationship between the key outcomes (food security, coping, and dietary diversity), market quality, and intervention layering, with consideration for shock exposure across the two time points. The associations explored in this report reflect internal queries posed by Feinstein and Mercy Corps after reviewing initial findings from the baseline report.

The data indicate that there are significant relationships between market quality/access and key food security outcomes. However, the directionality of the relationships is not consistent across indicators. Market quality/access was associated with significantly *higher* use of long-term coping strategies and significantly *lower* use of short-term coping strategies. Food insecurity and dietary diversity were also correlated to market quality/access, but only in the baseline: the worse the market quality/access, the higher a household's food insecurity and the lower their dietary diversity. Households are likely to be more reliant on markets for their household needs in worse food security years, such as the baseline relative to the midline. As conditions improved by the midline data collection, the relationship disappears, indicating a role for markets during periods of stress.

When distilling the components of the market index—quality and access—different relationships emerge. Household food security was primarily associated with market quality: the better the market quality (number of different goods available), the higher a household's food security. A similar relationship was found with dietary diversity: higher market quality was associated with greater dietary diversity. However, the better the market quality, the more long-term coping strategies a household utilized. On the other hand, the greater the distance to a market, the more short-term coping strategies were used and surprisingly, the greater the household dietary diversity.

In general, long-term coping strategies were associated with greater wealth as measured by livestock ownership and productive asset ownership (i.e., grinding mill, panga/machete, ox plow, etc.), and greater livestock-related wealth (i.e., cattle, donkey, goat, etc.), while short-term coping strategies were associated with lower livestock- and farm-related wealth.

We also explored how the relationship between market quality/access might be different across Light Touch (LTV) vs. Focus Villages (FV).[2] Market quality and availability was associated with *higher* use of long-term coping strategies and *lower* use of short-term coping strategies in LTV only. There was no distinction in FV. There was also no difference in food security, long-term coping strategies, short-term coping strategies, or household dietary diversity by intervention layering. One possible explanation is that the presence of MC programming breaks the relationship between market quality/access and food security and nutrition outcomes by improving household production, or by some other mechanism. We will explore these relationships further as part of the complete three-year analysis (2018, 2019, 2021).

In this report, we first describe the methodology used for the quantitative survey. We then discuss the findings, starting with food security, including months of in-adequate household food provisioning (the inverse of MAHFP), long- and short-term coping strategies, and dietary diversity, and then household livestock and asset wealth. For each variable, we explore how it has changed between

1 Every time this report refers to a baseline, midline, or endline, it is specifically referring to the Feinstein research study baseline, midline, and endline.
2 Light touch villages are communities where Mercy Corps has only one program and Focus Villages are communities where Mercy Corps has more than one program.

the baseline and midline, as well as the relationship with market quality/access and program layering. We then look at the experience of different types of shocks and whether they are mitigated by market access or programing layering. Finally, we end with a short discussion of the findings.

Methods

We used a two-stage randomized cluster sample across 52 villages (approximately 10 households per village) within four districts in two time periods (October/November 2018 and October/November 2019), resulting in a sample size of 521 households in 2018 and 488 households in 2019. The same households and, importantly, the same respondents were interviewed in each of the two time periods. To take advantage of the panel nature (i.e., interviewing the same people at multiple intervals) of the study design, we use mixed effects models for any analysis over time. The study design (villages serving as primary sampling units) is controlled for in all the analysis. Only relationships with a p-value[3] of less than 0.05 are marked as significant.

The sample size by district and time is shown in Table 1. We refer to the 2018 survey as the baseline and the 2019 survey as the midline.

Table 1. Sample size by district and time

	baseline (2018)		midline (2019)	
district	**frequency**	**percent**	**frequency**	**percent**
Amudat	172	33%	153	31%
Kaabong	120	23%	112	23%
Kotido	139	27%	132	27%
Moroto	90	17%	91	19%
Total	521	100%	488	100%

3 The **p-value** is the probability of finding the observed difference if the observed difference did not actually exist; thus, the smaller the p-value, the more significant the difference. For example, when we show that the p-value is 0.01 or 1% it means that 1% of the time the relationship you are seeing is by chance; if the p-value is 0.05 or 5% it means that 5% of the time the relationship you are seeing is by chance, and so on. Thus, we are more confident that a relationship exists when the p-value is small. For our analysis, we use a cut-off of 5% and only call a relationship significant if there is a 5% chance or less that the relationship is due to randomness or chance.

Findings

Food security

For the combined baseline and midline data, there was no significant ($p < 0.05$) relationship between our proxy of food insecurity (months of in-adequate household food provisioning (inverse MAHFP)) and our market index (time to market*inverse of available goods at market) (Table 2: model 2). There was also no relationship between the level of intervention (FV, LTV, vs. no intervention villages) and food security, for the combined baseline and midline, nor for each time period independently (Table 2: models 9, 10, and 11 respectively). There was also no significant difference in MAHFP between the baseline and midline, indicating that the two years had somewhat similar food security situations (Table 2: model 1).

Table 2. Analysis on food security (inverse MAHFP)

model	type of analysis	variable	co-efficient	p-value	95% confidence interval (CI)		n
1	mixed effects on baseline+midline	time	0.118	0.444	-0.184	0.420	944
2	mixed effects on baseline+midline	market index	0.000	0.360	0.000	0.000	938
3	OLS[4] on baseline, controlling for design effect	market index	0.001	**0.012**	0.000	0.001	480
4	OLS on endline, controlling for design effect	market index	0.000	0.310	-0.001	0.000	452
5	OLS on baseline, controlling for design effect	market quality	-0.130	**0.022**	-0.240	-0.020	482
6	OLS on baseline, controlling for design effect	market access	0.003	0.067	0.000	0.007	482
7	mixed effects on baseline+midline FV	market index	0.000	0.339	0.000	0.001	461
8	mixed effects on baseline+midline LTV	market index	0.000	0.749	0.000	0.001	350
9	mixed effects on baseline+midline	intervention (reference: FV)					941
		LTV	-0.224	0.407	-0.754	0.306	
		none	0.020	0.958	-0.731	0.772	
10	OLS on baseline, controlling for design effect	intervention (reference: FV)					479
		LTV	-0.390	0.313	-1.160	0.379	
		none	0.256	0.542	-0.581	1.093	
11	OLS on endline, controlling for design effect	intervention (reference: FV)					462
		LTV	-0.081	0.800	-0.724	0.561	
		none	-0.219	0.502	-0.871	0.433	

Note: bold highlights significant at $p < 0.05$

4 Ordinary Least Squares regression model

When we look at the relationship separately for the baseline (2018) versus the midline (2019), we do see a very different association across time between the market index and food security (Table 1: models 3 and 4 respectively). In the baseline, the better the market index, the better the household food security (MAHFP) ($p = 0.01$), but the size of the impact is fairly negligible. The relationship at the baseline primarily comes from the component of the index that measures market quality ($p = 0.02$): for each additional product available on the market, households' food insecurity drops by 0.12 months (3.6) days (Table 2: model 5). The relationship with travel time to market approaches significance ($p = 0.07$), and each additional hour of travel time increases food insecurity by 0.18 months (5.4 days) (Table 2: model 6).

There was no difference in the relationship between the market index and food insecurity (MAHFP) for the FV versus LTV (Table 2: model 7 and 8 respectively).

Coping strategies: long and short term

In this section, we look at the relationship between the market index, intervention layering, and long- and short-term coping strategies. When we note long-term coping, we specifically refer to strategies that are not reversible in the immediate future, including:

- selling livestock;
- slaughtering livestock;
- taking children out of school;
- selling households items;
- selling productive assets;
- getting a loan from a lender;
- marrying off your daughter for livestock/ bridewealth;
- all members of the household migrating.

Short-term or reversible strategies include:

- some family members migrating;
- sending a child to live with a non-relative;
- reducing consumption;
- only reducing consumption by women;
- feed working members of the household in place of non-working members;
- skipping meals;
- consuming wild food;
- harvesting crops early;
- consuming seeds;
- taking up new wage labor.

Use of long-term coping strategies and short-term coping strategies is significantly and positively associated, meaning the two are not replacements for one another: a household that uses short-term coping strategies is also likely to be using long-term coping strategies (Table 3: model 1). There is a significant difference in long-term coping strategies over time, with fewer long-term strategies used in the midline compared to the baseline (Table 3: model 2), but no significant difference in the number of short-term coping strategies used at baseline versus midline (Table 4: model 1).

There is no significant difference in long- or short-term coping strategies across the different intervention layering, for the baseline and midline as a whole, nor for each time period independently (Table 3: models 10, 11, and 12 respectively and Table 4: models 9, 10, and 11 respectively).

For the sample as a whole, households who have a better market index (high quality/short distance) are more likely to use long-term coping strategies ($p < 0.01$) (Table 3: model 3). This relationship is likely because many of the long-term coping strategies are based on selling livestock or assets, which is more possible if a market is readily accessible. However, the coefficient is practically 0, so while there is a significant relationship, it is negligible. The relationship holds for LTV ($p < 0.01$), but not FV (Table 3: models 9 and 8 respectively). The opposite relationship exists between short-term coping strategies and the market index: the better the market index, the fewer short-term coping strategies a household is likely to use ($p = 0.02$) (Table 4: model 2). But once again, the relationship only holds for LTV ($p = 0.04$) (Table 4: models 7 and 8).

In addition, similar to food insecurity, long-term coping strategies were only significantly associated with the market index at baseline (and for the combined baseline and midline): the better the market index, the more long-term coping strategies a household utilized ($p < 0.01$) (Table 3: models 4 and 5). No distinction between baseline and midline in

Table 3. Analysis on number of long-term coping strategies used

model	type of analysis	variable	co-efficient	p-value	95% confidence interval		n
1	mixed effects on baseline+midline	short-term strategies	0.066	**0.000**	0.038	0.094	1003
2	mixed effects on baseline+midline	time	-0.128	**0.025**	-0.240	-0.016	1006
3	mixed effects on baseline+midline	market index	-0.000	**0.001**	-0.000	-0.000	999
4	OLS[4] on baseline, controlling for design effect	market index	0.000	**0.003**	0.000	0.000	518
5	OLS on endline, controlling for design effect	market index	0.000	0.276	0.000	0.000	481
6	mixed effects on baseline+midline	market quality	0.046	**0.000**	0.022	0.070	1006
7	mixed effects on baseline+midline	market access	-0.001	0.092	-0.001	0.000	1006
8	mixed effects on baseline+midline FV	market index	0.000	0.202	0.000	0.000	494
9	mixed effects on baseline+midline LTV	market index	-0.000	**0.007**	-0.000	-0.000	368
10	mixed effects on baseline+midline	intervention (reference: FV)					1003
		LTV	-0.035	0.710	-0.218	0.148	
		none	-0.073	0.579	-0.331	0.185	
11	OLS on baseline, controlling for design effect	intervention (reference: FV)					518
		LTV	-0.052	0.670	-0.294	0.191	
		none	-0.048	0.789	-0.408	0.312	
12	OLS on endline, controlling for design effect	intervention (reference: FV)					485
		LTV	-0.011	0.904	-0.205	0.182	
			-0.091	0.545	-0.395	0.211	

Note: bold highlights significant at $p < 0.05$

terms of the relationship between the market index and short-term coping strategies was visible (Table 4: models 3 and 4).

When distilling the market index into its components, availability of many different goods is a significant predictor of using long-term coping strategies ($p < 0.01$), but distance is not a predictor of long-term coping strategies (Table 3: models 6 and 7 respectively). The relationship between market quality and long-term coping strategies is fairly small: the availability of each additional good in the market is associated with 0.05 additional coping strategies used. For short-term coping strategies, greater distance to a market is associated with households reporting using more short-term coping strategies, while market quality is not significant (Table 4: models 5 and 6).

Table 4. Analysis on number of short-term coping strategies used

model	type of analysis	variable	co-efficient	p-value	95% confidence interval		n
1	mixed effects on baseline+midline	Time	-0.097	0.419	-0.332	0.138	1005
2	mixed effects on baseline+midline	market index	0.000	**0.015**	0.000	0.001	998
3	OLS on baseline, controlling for design effect	market index	0.000	0.187	0.000	0.001	518
4	OLS on endline, controlling for design effect	market index	0.000	0.291	0.000	0.001	480
5	mixed effects on baseline+midline	market quality	-0.018	0.508	-0.070	0.034	1005
6	mixed effects on baseline+midline	market access	0.001	**0.049**	0.000	0.003	1005
7	mixed effects on baseline+midline FV	market index	0.000	0.790	0.000	0.000	493
8	mixed effects on baseline+midline LTV	market index	0.000	**0.038**	0.000	0.001	369
9	mixed effects on baseline+midline	intervention (reference: FV)					1002
		LTV	0.183	0.508	-0.359	0.725	
		none	-0.474	0.225	-1.239	0.292	
10	OLS on baseline, controlling for design effect	intervention (reference: FV)					518
		LTV	0.215	0.542	-0.488	0.918	
		none	-0.513	0.377	-1.669	0.643	
11	OLS on endline, controlling for design effect	intervention (reference: FV)					484
		LTV	0.140	0.618	-0.421	0.701	
		none	-0.426	0.115	-0.959	0.108	

Note: bold highlights significant at $p < 0.05$

Dietary diversity

In this section, we look at household dietary diversity, using the Household Dietary Diversity Index (HDDI). Similar to food insecurity and short-term coping strategy use, there is no significant difference over time in HDDI (Table 5: model 1).

There is also no significant difference in HDDI between the different intervention layers, for the combined baseline and midline sample, nor for each time period independently (Table 5: models 9, 10, and 11). Nor is the relationship between market access and dietary diversity different in FVs versus LTVs (Table 5: models 7 and 8).

And while there is no significant relationship between HDDI and market index for the sample as a whole (Table 5: model 2), similar to MAHFP we do see a significant relationship at the baseline (but not the midline) (Table 5: models 3 and 4). At baseline, the worse the quality of the market, the significantly lower the household dietary diversity, but again, the size of the impact is negligible. When dissecting

Table 5. Analysis on Household Dietary Diversity Index (HDDI)

model	type of analysis	variable	co-efficient	p-value	95% confidence interval		n
1	mixed effects on baseline+midline	Time	0.237	0.188	-0.116	0.592	954
2	mixed effects on baseline+midline	market index	-0.000	0.501	-0.001	0.000	947
3	OLS on baseline, controlling for design effect	market index	-0.000	**0.011**	-0.001	0.000	457
4	OLS on endline, controlling for design effect	market index	0.000	0.410	0.000	0.001	460
5	mixed effects on baseline+midline	market quality	0.120	**0.001**	0.047	0.194	954
6	mixed effects on baseline+midline	market access	0.002	**0.005**	0.001	0.005	954
7	mixed effects on baseline+midline FV	market index	0.000	0.965	-0.001	0.001	468
8	mixed effects on baseline+midline LTV	market index	-0.000	0.191	-0.001	0.000	346
9	mixed effects on baseline+midline	intervention (reference: FV)					951
		LTV	-0.209	0.369	-0.667	0.248	
		none	0.206	0.528	-0.434	0.847	
10	OLS on baseline, controlling for design effect	intervention (reference: FV)					487
		LTV	-0.280	0.403	-0.950	0.388	
		none	0.551	0.283	-0.469	1.572	
11	OLS on endline, controlling for design effect	intervention (reference: FV)					464
		LTV	-0.155	0.727	-1.042	0.732	
		none	-0.157	0.830	-1.626	1.311	

Note: bold highlights significant at $p < 0.05$

the components of the market index, we find that the greater the market quality, the higher the HDDI (Table 5: model 5), but surprisingly, the farther the market, the higher the HDDI as well (Table 5: model 6). The relationship with market quality makes sense as it is an indicator based on the diversity of goods available at the market, so the greater the diversity of market goods, the greater the diversity of household dietary intake.

Shocks

In this section, we look at some of the same relationships but test whether they are affected given exposures to different shocks, including climate, conflict, and economic shocks. Experience of all shocks significantly declined between the baseline and midline ($p = 0.01$, $p = 0.03$, and $p < 0.01$ respectively) (Table 6: models 1, 2, and 3).

Of all three types of shocks, only climate shocks were associated with our food security and coping outcomes (but not dietary diversity): the greater the number of climate shocks experienced, the lower the household food security ($p < 0.01$) and the greater the use of long- and short-term coping strategies ($p < 0.01$) (Table 6). Access to good-quality markets

Table 6. Mixed effects models: food and nutrition outcomes in relation to shocksnutrition outcomes in relation to shocks

model	type of analysis	variable	co-efficient	p-value	95% confidence interval		n
1	economic shock	time	-10.047	**0.000**	-13.572	-6.523	1009
2	conflict shock	time	-1.369	**0.029**	-2.600	-0.139	1009
3	climate shock	time	-0.248	**0.014**	-0.448	-0.050	1009
4	MAHFP	climate shock	0.247	**0.000**	0.154	0.340	944
5	MAHFP	conflict shock	-0.013	0.094	-0.029	0.002	944
6	MAHFP	econ. shock	0.001	0.508	-0.004	0.007	944
7	long-term coping	climate shock	0.100	**0.000**	0.066	0.135	1006
8	long-term coping	conflict shock	0.005	0.057	0.000	0.012	1006
9	long-term coping	econ. shock	0.001	0.274	-0.001	0.003	1004
10	short-term coping	climate shock	0.185	**0.000**	0.113	0.258	1005
11	short-term coping	conflict shock	-0.002	0.645	-0.015	0.010	1005
12	short-term coping	econ. shock	0.001	0.632	-0.003	0.005	1005
13	HDDI	climate shock	0.076	0.166	-0.032	0.185	954
14	HDDI	conflict shock	0.006	0.448	-0.011	0.025	954
15	HDDI	econ. shock	-0.004	0.162	-0.010	0.002	954

Note: bold highlights significant at $p < 0.05$

(market index variable) (Table 7) or living in an FV did not mitigate the relationship between climate shocks and food security or coping strategies (Table 8).

Productive assets (farm and livestock) ownership and wealth (farm and livestock) in relation to coping strategies

Overall, ownership of non-livestock productive assets significantly declined between the two years (Table 9). However, when looking at individual assets, the only significant decline is reported ownership of the panga/machete. More so, there is a significant *increase* in the percentage of households who reported owning a solar panel. When it comes to livestock-related assets (Table 10), there is no significant difference over time in total Tropical Livestock Units (TLUs),[5] with the only significant decrease reported in chicken ownership. Thus, it appears that household members were more likely to part with non-livestock productive assets as opposed to livestock assets between 2018 and 2019.

5 TLU is a wealth indicator that standardizes across different livestock to create one composite measure. To convert individual livestock ownership into TLUs, we used the following conversion factors (based on relative value of the livestock): cattle = 0.7, sheep = 0.1, goats = 0.1, pigs = 0.2, chickens = 0.01.

Table 7. Does market access mitigate relationship between climate shocks and food and nutrition outcomes?

type of analysis	variable	co-efficient	p-value	95% confidence interval	
MAHFP	climate shock	0.173	0.005	0.054	0.294
	market access	-0.000	0.184	-0.002	0.000
	interaction btw climate shock and market	0.000	0.097	0.000	0.000
	constant	4.357	0.000	3.751	4.965
	n	938			
long-term coping	climate shock	0.123	0.000	0.079	0.167
	market access	-0.000	0.788	0.000	0.000
	interaction btw climate shock and market	-0.000	0.236	0.000	0.000
	constant	0.562	0.000	0.338	0.786
	n	999			
short-term coping	climate shock	0.207	0.000	0.113	0.302
	market access	0.000	0.090	0.000	0.001
	interaction btw climate shock and market	-0.00	0.334	0.000	0.000
	constant	2.216	0.000	1.703	2.730
	n	998			

Table 8. Relationship between food and nutrition outcomes and climate shocks in FV only

outcome	variable	coefficient	p-value	95% confidence interval		n
MAHFP	climate shock	0.149	0.025	0.019	0.279	497
long-term coping	climate shock	0.071	0.006	0.021	0.121	500
short-term coping	climate shock	0.139	0.009	0.035	0.243	499

Table 9. Non-livestock productive assets over time (n = 1,009)

asset	year	mean/% report owning asset	95% confidence interval		p-value
total assets mean	2018	4.40	4.09	4.71	0.000
	2019	3.12	2.78	3.45	
radio	2018	15%	12%	19%	0.750
	2019	15%	11%	19%	

asset	year	mean/% report owning asset	95% confidence interval		p-value
mobile	2018	46%	40%	52%	0.706
	2019	45%	39%	50%	
mattress	2018	27%	19%	35%	0.856
	2019	26%	19%	34%	
solar panel	2018	17%	14%	21%	0.042
	2019	23%	18%	27%	
wheelbarrow	2018	9%	6%	12%	0.279
	2019	11%	7%	14%	
bicycle	2018	12%	9%	16%	0.720
	2019	13%	9%	17%	
motorbike	2018	3%	2%	5%	0.179
	2019	2%	1%	3%	
ox plow	2018	30%	22%	39%	0.683
	2019	32%	24%	40%	
panga	2018	95%	93%	97%	0.000
	2019	78%	73%	83%	
grinding mill	2018	0%	0%	1%	0.678
	2019	0%	0%	1%	
cart	2018	7%	4%	9%	0.623
	2019	8%	5%	11%	

Table 10. Livestock-related assets over time

asset	year	mean	95% confidence interval		p-value
total herd TLU	2018	5.849	4.786	6.912	0.914
	2019	5.915	4.928	6.902	
dry herd	2018	4.292	3.353	5.231	0.823
	2019	4.170	3.359	4.981	
milk herd	2018	1.760	1.438	2.082	0.798
	2019	1.799	1.473	2.126	
sheep	2018	6.207	4.315	8.100	0.834
	2019	6.471	4.494	8.449	
camel	2018	0.111	0.018	0.205	0.300
	2019	0.189	0.052	0.325	

asset	year	mean	95% confidence interval		p-value
donkey	2018	0.251	0.133	0.370	0.472
	2019	0.207	0.093	0.321	
goat	2018	7.188	5.874	8.502	0.522
	2019	7.779	5.920	9.637	
pig	2018	0.052	-0.034	0.137	0.325
	2019	0.008	-0.003	0.020	
chicken	2018	2.543	1.939	3.147	0.026
	2019	1.787	1.419	2.154	

Table 11. Relationship between productive assets and coping strategies (fixed effects)

outcome	variable	coefficient	p-value	95% confidence interval		n
total (non-farm) assets	long-term coping	0.340	0.003	0.113	0.567	1006
total herd TLU	long-term coping	1.570	0.000	0.764	2.375	1006
total (non-farm) assets	short-term coping	0.041	0.450	-0.065	0.148	1005
total herd TLU	short-term coping	0.215	0.269	-0.167	0.598	1005

Table 12. Relationship between coping strategy use and animal- and farm-related wealth (mixed effects)

outcome	variable	coefficient	p-value	95% confidence interval		n
long-term coping	animal wealth	0.147	0.000	0.119	0.175	1004
long-term coping	farm wealth	0.018	0.374	-0.022	0.060	1004
short-term coping	animal wealth	-0.082	0.011	-0.145	-0.019	1003
short-term coping	farm wealth	-0.146	0.001	-0.236	-0.056	1003

There is no evidence that the use of long-term coping strategies depletes household productive assets (livestock and non-livestock related) (Table 11). Instead, the evidence points to the fact that households with more livestock- and non-livestock-related assets are more likely to use these strategies in the first place. Short-term coping strategies on the other hand do not have a positive or negative effect on livestock- and non-livestock-related assets.

Next, we look at the relationship between our animal- and farm-related wealth variables and long- and short-term coping strategies. Similar to the analysis above, we find that animal-related wealth is associated with greater use of long-term coping strategies, with no relationship to farm-related wealth. On the other hand, households with lower animal- and farm-related wealth were significantly more likely to use short-term coping strategies (Table 12).

Discussion

There is some indication that the baseline represented a more difficult year for households in terms of the experience of conflict, climate, and economic shocks. While we do not find a significant difference in food security, dietary diversity, or short-term coping strategies, households were significantly more likely to use more long-term coping strategies in the baseline compared to the midline. We know that in general, the more climate shocks a household experiences, the worse their food security and the greater their use of both short- and long-term coping strategies. The difference is further supported by the Integrated Food Security Classification (IPC) for Karamoja in December of 2018 versus December 2019. In December 2018,[6] the IPC level was 3 (critical), while in December of 2019[7] it was only minimal (IPC level 1). Specifically, the December 2018 Famine Early Warning Systems Network (FEWS NET) report made the following observations:

> *In Karamoja, exceptionally dry conditions are causing early declines in livestock production, while rising food prices are expected to drive declines in the terms of trade.*
>
> *In Kotido, the terms of trade for sorghum against firewood, charcoal, and goats are now below the five-year and 2017 average, significantly restricting food access for poor households.*
>
> *Unimodal harvests across Karamoja were completed in October. Significantly below-average production was widespread, and FEWS NET estimates that production was 60 to 80 percent below average across the sub-region's districts. In Kaabong and Kotido districts, specifically, production was significantly below average to failed. By November, most poor households had already depleted their household stocks from the harvest. As a result, they are primarily relying on markets for their food needs, and some households choose to supplement this with wild fish, game, and vegetables where they are available.*

The distinction between the baseline and midline in terms of a significantly greater experience of shocks at the baseline could be part of the explanation why the relationship between market access/quality and food security, long-term coping strategies, and dietary diversity is stronger at the baseline. As reported in the FEWS NET report, households at the baseline were far more reliant on markets for their household needs, and thus a significant relationship is observed. With improved conditions by the 2019 data collection, the relationship between our food and nutrition outcomes and market access is no longer significant. Thus, markets quality and access clearly play a far more important role in periods of stress.

Interestingly, the data indicate that market quality (meaning the number of goods available in a market) supports households through periods of stress by allowing them to carry out long-term, non-reversible coping strategies (such as selling livestock and assets). While the use of long-term coping strategies can temporarily relieve household stress and allow them to meet their daily household needs, over time it can deplete their productive resources. However, we do not find evidence of this in the data. We find that households who used more long-term coping strategies actually improved their total livestock and asset ownership. This relationship is likely capturing the role of wealth in a household's ability to move around their livestock and assets to meet their needs. Households who have greater animal wealth (a mix of animal and asset ownership and expenditure data, with greater weights attached to animal ownership) are more likely to use long-term coping strategies in the first place. Households who have lower animal and farm wealth are significantly more likely to have to rely on short-term coping strategies.

The data did not indicate that living in FV versus LTV or villages with no MC programming was associated with better food security, less use of short- or long-

6 https://fews.net/east-africa/uganda/food-security-outlook/december-2018.
7 https://fews.net/east-africa/uganda/food-security-outlook-update/december-2019.

term coping strategies, or higher dietary diversity. However, when looking at the relationship between market quality/access and these food and nutrition outcomes, coping strategies are only significant in the LTV and not in the FV. One possible explanation is that the presence of MC programming breaks the relationship between market quality/access and food security and nutrition outcomes by improving household production, or by some other mechanism. We will explore these relationships further in the combined analysis of the baseline, midline, and final round of data collection, October/November 2021.

The Feinstein International Center is a research and teaching center based at the Friedman School of Nutrition Science and Policy at Tufts University. Our mission is to promote the use of evidence and learning in operational and policy responses to protect and strengthen the lives, livelihoods, and dignity of people affected by or at risk of humanitarian crises.

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