Can asset transfer and asset protection policies alter poverty dynamics in northern Kenya?

Baseline survey data report

ILRI RESEARCH REPORT
57

Can asset transfer and asset protection policies alter poverty dynamics in northern Kenya? Baseline survey data report

Vincent Alulu, Oscar Naibei, Philemon Chelanga, Watson Lepariyo and Nathan Jensen

International Livestock Research Institute

March 2020


USAID
FROM THE AMERICAN PEOPLE


BOMA
PROJECT


INNOVATION LAB
FOR
ASSETS &
MARKET ACCESS

ILRI thanks all donors and organizations which globally supports its work through their contributions to the CGIAR Trust Fund

Editing, design and layout—ILRI Editorial and Publishing Services, Addis Ababa, Ethiopia.

Cover photo—ILRI/Apollo Habtamu

ISBN: 92–9146–607–7

Citation: Alulu, V., Naibei, O., Chelanga, P., Lepariyo, W. and Jensen, N. 2020. *Can asset transfer and asset protection policies alter poverty dynamics in northern Kenya? Baseline survey data report*. ILRI Research Report 57. Nairobi, Kenya: International Livestock Research Institute (ILRI).

Patron: Professor Peter C Doherty AC, FAA, FRS
Animal scientist, Nobel Prize Laureate for Physiology or Medicine–1996

Box 30709, Nairobi 00100 Kenya
Phone +254 20 422 3000
Fax+254 20 422 3001
Email ilri-kenya@cgiar.org

ilri.org
better lives through livestock

ILRI is a CGIAR research centre

Box 5689, Addis Ababa, Ethiopia
Phone +251 11 617 2000
Fax +251 11 667 6923
Email ilri-ethiopia@cgiar.org

ILRI has offices in East Africa • South Asia • Southeast and East Asia • Southern Africa • West Africa

Contents

Tables		iv
Figures		v
Summary		vi
Acknowledgements		vii
1.	Introduction	1
	Research objectives	1
	Study region	2
	Timeline	2
2.	Research design	3
	Sampling frame	3
	Treatments arms	4
	Balance of baseline data across intended treatments	5
3.	Summary statistics	6
	Livelihood and income	6
	Income generated	7
	Transfers	8
	Employment programs	9
	Individual transfers	9
	Other aid	10
	Livestock	10
	Insurance	12
	Cognitive assets and empowerment	12
	Food security	13
4.	Conclusion	15
References		16

Tables

Table 1: Treatment arms in group 1 and group 2 2

Table 2: Translation of manyatta-specific community-based wealth categories into wealth categories to be used by the project 3

Table 3: Summary of treatment arms and surveyed participants 4

Table 4: Mean values of control (Ctrl) and treatment (Trt), the normalized difference (ND), and the p-value for a t-test of differences between the control and treated arms (P-v) 5

Table 5: Participant and household characteristics 6

Table 6: Annual income 7

Table 7: Participation in transfers by transfer type and income 8

Table 8. Mean value of transfer received 9

Table 9: Type and origin of transfers 9

Table 10:Mean transfer by source/origin 10

Table 11:Mean aid conditional on receiving this aid 10

Table 12:Livestock owned and herded 10

Table 13:Herd dynamics among herded animals between March 2017 and February 2018 11

Table 14: Respondents purchasing insurance from TIA and mean TLU purchased conditional on knowledge of TIA 12

Table 15: CED-D-10 score summary statistics by wealth group 12

Table 16: Household dietary diversity (HDDS) and Women Dietary Diversity Score (WDDS) by wealth group 14

Figures

Figure 1: Kenya with Samburu county and Samburu country with the study wards 2

Figure 2: Income generating activities by mentor area and wealth, with the poor represented on the left and the vulnerable group represented on the right 7

Figure 3: Participation in transfers 8

Figure 4: Reasons for livestock loss 11

Figure 5: Respondent awareness of insurance 12

Figure 6: Current food security for children, women and the household 13

Summary

This document summarizes the baseline data collected from 1,875 households in Samburu county, Kenya, during early 2018 under the project "Can asset transfer and asset protection policies alter poverty dynamics in northern Kenya?" The project aims to examine the impact of insurance coverage and a graduation program on targeted women of the region. The insurance is a commercial product known as Index-Based Livestock Insurance (IBLI) and offered by Takaful Insurance of Africa. The graduation program is known as Rural Entrepreneur Access Program (REAP) and is being implemented by the BOMA Project. Randomized REAP and IBLI interventions were implemented just after this baseline was collected. The project plans to collect a midline survey in 2020 and an endline survey in 2022.

Acknowledgements

This project was made possible through support provided by the United States Agency for International Development (USAID) under the terms of Award No. AID-OAA-A-14-00021. The opinions expressed in this document are those of the authors and do not necessarily reflect the views of USAID.

1. Introduction

Over the last few years, the pastoral regions of northern Kenya have seen a number of pioneering interventions intended to reduce poverty and vulnerability of households. The research described in this document aims to examine two such interventions—Index Based Livestock Insurance (IBLI) and the Rural Entrepreneur Access Program (REAP).

The IBLI program was first launched in Marsabit county in 2009, offering, for the first time, a financial tool to help pastoralists reduce the large impact of drought by providing indemnity payments during periods of drought and forage scarcity. In the following years, commercial providers scaled the program across additional arid and semi-arid counties of Kenya, while at the same time the Government of Kenya began making IBLI transfers to 15,000 targeted households in the region under the Kenya Livestock Insurance Program (KLIP). KLIP was introduced with the idea that its contingent payments could help families hold on to valuable assets and sustain their investments even in the face of drought[1].

REAP is an intervention that was developed and introduced in northern Kenya in 2009 by the non-governmental organization known as the BOMA Project. The REAP program aims to enable poor women graduate from poverty by helping them start sustainable businesses. The program includes financial coaching, business training and seed funds. Eligible women are selected through a rigorous process of initial wealth ranking of each household by community members, followed by household level validation facilitated by BOMA staff. Uniquely, the program facilitates the formation of three-women business groups that are the foundation of each intervention. The BOMA project has now helped to launch over 5,200 businesses and 830 savings groups which have directly involved over 15,600 women[2].

While separate impact evaluations of each program show evidence of positive outcomes, it is not clear if either program is sufficient to help poor households accumulate assets and improve their well-being in the long term[3]. Furthermore, there are reasons to believe that such varied approaches to poverty alleviation could interact in complementary ways. For example, an analysis of interactions between the IBLI program and the Hunger Safety Net Program (HSNP)—an unconditional cash transfer program also taking place in northern Kenya—found that cash transfers increased IBLI uptake, while anecdotes from a region where REAP and HSNP overlapped reported program interactions among households that received both the REAP intervention and HSNP transfers (Jensen et al. 2018). In environments where there is potential for interventions to overlap, it is critical to know if those programs complement each other, are redundant, or undermine each other. This research aimed to understand better the impacts of government subsidized insurance, REAP interventions, potential interactions between the two programs, and how to implement these two programs in a cost effective manner.

1. Find out more about KLIP: https://mombasa-2018.climate-risk-transfer.org/

2. Find out more about The BOMA Project and the REAP intervention: http://bomaproject.org/

3. An impact evaluation of REAP was done by Gobin, Santos and Toth (2016). Impact evaluations of IBLI were done by Janzen and Carter (2018), Jensen et al. (2017) and Matsuda et al. (2019).

Research objectives

The primary objectives of this research were to:

1. measure the individual impacts of the REAP program and KLIP-like insurance subsidies/transfers;
2. compare those impacts to a package that combines both REAP and KLIP, like insurance subsidies/transfers; and
3. identify the optimal implementation design for meeting each program's mission in a cost-effective way by testing the efficacy of different premium subsidy structures for increasing IBLI uptake and valuating the economic and social spillovers of the REAP program within communities.

To do so, we implemented a randomized control trial that contains four treatment arms—control, REAP, IBLI, and both IBLI and REAP. REAP explicitly targets the poorest women while this research is also interested in examining the impact of IBLI on poor and vulnerable households; the IBLI treatments will include poor and vulnerable women while only the poor will receive REAP treatments. Table 1 illustrates the research design across these wealth categories.

Table 1: Treatment arms in group 1: poorest (left) and group 2: vulnerable (right)

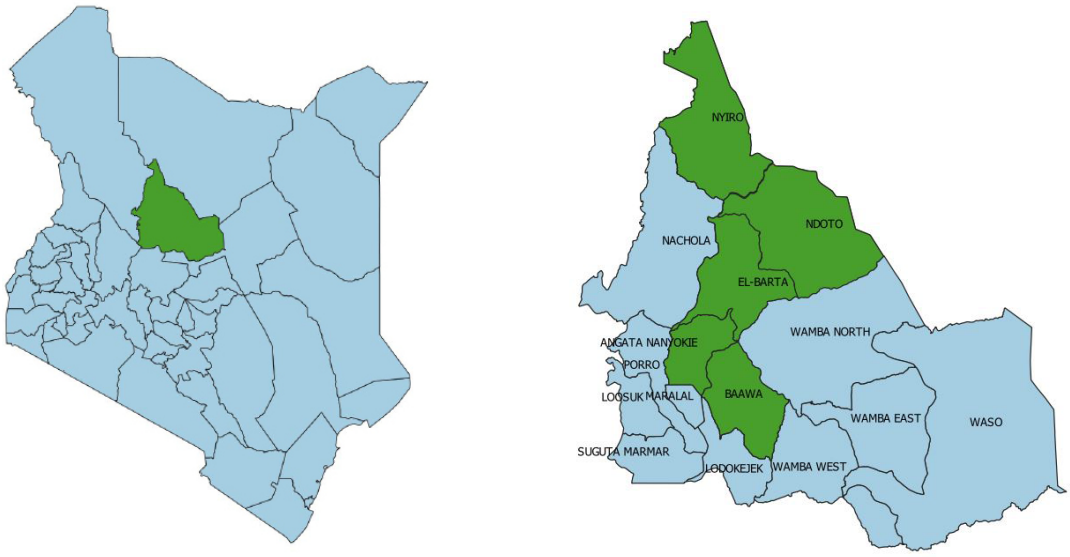
		Insurance	
		No	Yes
REAP |	No	A	B
	Yes	C	D

		Insurance	
		No	Yes
REAP |	No	E	F
	Yes	-	-

Study region

The study was implemented in the northern part of Samburu county in Kenya (Figure 1). This region was selected because it is a pastoral region with a high rate of poverty and although it was included in the target regions for both programs, neither program was implementing there at the time of planning[4]. Thus, it provided a very relevant yet uncontaminated study region.

Figure 1: Kenya with Samburu county highlighted (left) and Samburu country with the study wards highlighted (right)



4. In 2015 for example, the incidence of poverty in Samburu was 73%, well above the country's average of 45.2 (Wiesmann et al. 2016).

Timeline

This project was launched in December 2017 and will close in March 2022. During that time, the BOMA Project plans to graduate 2,100 women from its REAP program; Takaful Insurance of Africa (TIA) plans to have eight sales windows in the study area; and ILRI plans to distribute insurance premium discount coupons four times, collect a baseline survey (2018), a midline survey (2020), and an endline survey (2022).

2. Research design

Sampling frame

This study focuses on households that are either poor or vulnerable as defined by the following procedures. A household census with accompanying household wealth status for the study region was collected using BOMA's community-based assessment procedure known as participatory rural appraisal (PRA). The PRAs involve asking manyatta (the smallest unit of community) members to list all the households in their manyatta, and then asking them to rank each household according to manyatta-defined wealth categories. In BOMA's experience from similar neighbouring regions, manyattas typically have about 50–100 families and settle on between three and five wealth categories, with a large portion (about 50%) of the community falling into the bottom two categories. As per BOMA's standard operating procedures, those households categorized by the community into the lowest two wealth categories, are designated PRA-qualified.

BOMA then visited the subset of households that were PRA-qualified to assess REAP eligibility. This second process uses a tool that BOMA calls the Participant Targeting Tool (PTT) and screens households for characteristics believed to make program participation inappropriate, such as extreme old age, unavailability of a woman household member, mental infirmness, and drug addiction. Those households passing the PTT are then classified REAP-eligible and comprise the pool that this study sampled from for the Group 1 or poor households (Table 1a).

The IBLI team then also identified a second group of households from the PRA list, which is comprised of the set of households that were designated to a wealth class just above the PRA-qualified threshold but are still quite poor—the vulnerable. Specifically, these were households PRA-classified as being in wealth class 3[5]. We call these households Group 2 or the vulnerable households (Table 1b).

Table 2 summarizes the expected and actual classification rates among households in the study region. The observed rate of Group 1 households was higher than expected (68% rather than 50%), as was the rate of ineligibility among Group 1 households. The research team does not expect the deviation from expected (perceived) poverty rates to impact the survey negatively. Logistically, the main impact was that the wealth class 3 was occasionally too small to fill the intended manyatta-level vulnerable sample, in which case the next wealth group up in that manyatta was sampled from.

Table 2: Translation of manyatta-specific community-based wealth categories into wealth categories to be used by the project

Group	Expected percent of population*	Actual percent of population^	Wealth level	REAP	IBLI
1	50 (45)	68 (60)	Poor	Eligible	Eligible
2	25	16	Vulnerable	Ineligible	Eligible
3	25	16	Better off	Out of sample frame	

* Estimate from past BOMA activities.
^ Results from BOMA's PRA-PTT process.
() Group1 households that pass PTT screening in parenthesis

5. In a few cases class four households were include if there were few households in class three in a particular manyatta.

Sampling

The roster of REAP-eligible and Group 2 women composed our sample frame. Power calculations relying on a set of assumptions on compliance rates, attrition rates, and outcome variance indicated that our study required a sample of 1,640. This sample size was later increased due to concerns that attrition rates would be higher than expected because of the high degree of mobility in the area and to reflect the possibility that some households found to be REAP-eligible during the PTTs in 2018, would have lost eligibility before joining the program, which could happen as late as 2020, effectively lowering compliance rates. A second addition to the sample size took place midway through the survey, when it was found that a sizable contingent of sample households (~200) relied mostly on cropping for their income[6]. The final sample included 1,875 households.

In both cases the additional sample households were placed in the Control or IBLI research arms so as to not increase the number of REAP businesses. To maintain the 700 REAP-businesses, we will draw from the Group 1, non-REAP treatment arms, to replace households that were to receive REAP treatment but will not, i.e. that leave the study, or lose eligibility before REAP treatment. The outcome is that the poor non-REAP arms will be drawn down during the study to maintain REAP treatment levels. To account for this, we have increased the sample size of the poor non-REAP arms.

We originally planned to sample by manyatta, proportional to population. In some cases, where the size of a wealth class in a manyatta is far under the expected (average) value, proportional sampling would have resulted in oversaturating Group 1. For example, the manyatta urban in the mentor area—a programmatically defined geographic unit similar to the ward administrative unit—Opiroi had a population of 66, but only 13 households (20%) passed the PTTs and thus became REAP-eligible. According to population-based proportional sampling, we would have assigned 4 businesses to the manyatta, which would have resulted in 12 REAP-treated businesswomen, leaving only one eligible woman for the REAP-eligible control arm. The situation of too few eligible households for treatment and control was common enough when using population-based proportional sampling, that we decided that we needed a different approach.

Sampling proportional to the population of REAP-eligible women is the cleanest (least likely to require manual adjustments) and most statistically powerful for comparing the two programs' impacts on the REAP-eligible population. Therefore, we sampled from the REAP-eligible households, proportional to each manyatta's population of REAP eligible households. Population-level analysis can then be performed by weighting observations by the following ratio, where the weight_{im} is the weight for householdim living in manyatta_{m}

$$\text{weight}_{\text{im}} = \frac{\text{poulation of manyatta}_{\text{m}}}{\text{sum of REAP eligible in manyatta}_{\text{m}}} * \frac{\text{sum of REAP eligible in all manyattas}}{\text{poulation across all manyattas}}$$

Treatment arms

A chief objective of this study is to examine the impact of each program individually and in combination. To do so, the study uses four research arms. Group 1 REAP-eligible participants were randomly divided into four arms—REAP, IBLI, REAP + IBLI, and control—after stratifying by manyatta. Using the same protocols, Group 2 participants were allocated into two treatment arms, IBLI and control. Table 1 combines wealth level estimates with the number of participants in each arm.

Table 3: Summary of treatment arms and surveyed participants

Group	Wealth level	Arm 1: Control	Arm 2: IBLI only	Arm 3: REAP only	Arm 4: REAP + IBLI	Total
1	Poor	407	405	350	340	1,502
2	Vulnerable	186	187	*	*	373
3	Better off	*	*	*	*	
Total		593	592	350	340	1,875

*Out of the sampling frame

6. Acknowledging that cropping households in the region are likely to face risks that are correlated to forage availability, these are households for whom livestock are less important and IBLI may be less relevant. Such variation is nice for studying heterogenous impacts of IBLI across environments and livelihoods but could pose a risk to the power of our analysis.

Balance of baseline data across intended treatments

The intended treatment status of each household was randomized and determined before the baseline survey was collected. Here we provide an analysis of balance across the intended treatment arms. Table 4 includes tests for differences in the number of animals owned, reduced coping strategy index (rCSI, Maxwell and Caldwell 2008) and food consumption scores (FCS, WFP 2008) across treatment arms but within group (poor or vulnerable). We report the with-in group means, their normalized differences (ND) and the p-values from a t-test for significant differences between groups[7]. While there are some small differences between treatment and control, they are nothing more than is excepted between random subsamples of finite populations, suggesting valid randomization into treatment arms.

Table 4: Mean values of control (Ctrl) and treatment (Trt), the normalized difference (ND), and the p-value for a t-test of differences between the control and treated arms (P-v)

	Poor				Vulnerable				Combined			
Variable	Ctrl	Trt	ND	P-v	Ctrl	Trt	ND	P-v	Ctrl	Trt	ND	P-v
Cattle (TLU)	3.1	3.5	0.13	0.07	3.5	2.7	0.25	0.09	3.2	3.3	0.03	0.43
Camel (TLU)	2.0	2.2	0.12	0.39	2.5	3.0	0.27	0.46	2.1	2.4	0.18	0.25
Shoats (TLU)	0.9	1.0	0.08	0.24	0.9	0.9	0.00	0.81	0.9	1.0	0.09	0.30
rCSI	6.10	5.95	0.04	0.60	5.28	5.20	0.02	0.79	5.91	5.80	0.03	0.52
FCS	5.47	5.43	0.02	0.74	5.87	5.93	0.02	0.83	5.55	5.53	0.01	0.86

Note: TLU refers to Tropical Livestock Units, which is a method used for aggregating different types of animals into a single statistic based on their metabolic weight. To do so, the following formula is used Herd TLU= 1.4 * number of camels + 1.0 * number of cattle + 0.1 * number of sheep + 0.1 * number of sheep.

7. $ND = \frac{|\bar{X}_T - \bar{X}_C|}{\sqrt{(S_T^2 + S_C^2)/2}}$ where $\bar{X}_T$ & $\bar{X}_C$ are the means for treatment and control groups respectively, whereas S_T^2 & S_C^2 are the variances for treatment and control groups respectively. The resulting statistic is no longer dependent on the respective unit of measurement (scale-invariant) and thus the measurements can be compared across different variables. While there is currently no universally recognized cut-off point as to what is considered the upper limit, Normand et al. (2001) suggest that a standardized difference of less than 0.10 is indicative of good balance. See also: http://dx.doi.org/10.21037/atm.2018.12.10

3. Summary statistics

The majority of the sample households have over five members, most of whom are children and are fully sedentary (Table 5). While few participants have any formal education, most households that have school-aged children, have at least one child that is attending school.

Table 5: Participant and household characteristics

Variable	Observations	Mean (standard deviation)
Household size	1,875	5.5 (2.1)
Adult equivalent[A]	1,872	1.9 (1.3)
Settlement type (%)		
Fully sedentary (1=true)	988	52.7
Partially sedentary (1=true)	462	24.6
Nomadic (1=true)	425	22.7
Mid-Upper Arm Circumference (MUAC)	1,331	139.7 (11.6)
Ratio with SAM[B]	1,331	0.01
Ratio with MAM[C]	1,331	0.08 (0.3)
Participant's age (years)	1,875	36.0 (16.1)
Participant's education level (%)		
None	1,638	87.4
Primary	184	9.8
Secondary	38	2
Diploma	11	0.6
University degree	4	0.2
School attendance (% with at least one child in school)	1,276	69.8
School fee (paid over last 12 months)	1,113	14,616 (29,924)
Medical fee (paid over last 12 months)	1,444	7,131 (22,417)

Notes:
A Number of children (<18 years) supported by 1 adult in a household. Three (3) households have no adults.
B MUAC<115 mm
C MUAC >=115 mm and MUAC <125 mm

Livelihood and income

The survey sought to establish the different types of income-generating activities that the pastoralists engaged in the previous year and income generated from these activities.

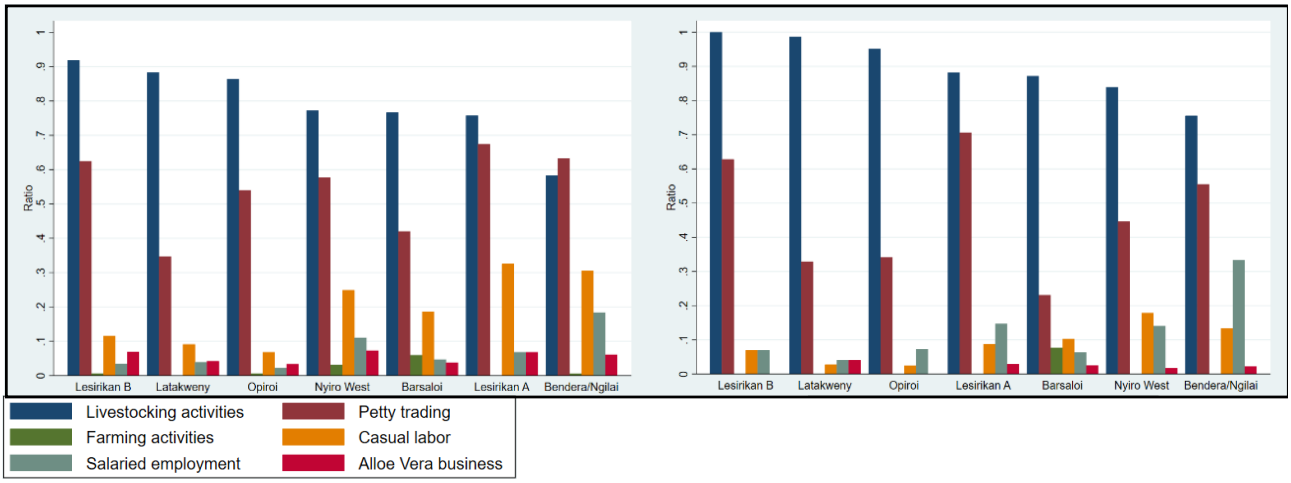
Income generating activities

Livestock rearing and accompanying activities is the most common income-generating activity among the survey households (Figure 2). This is the case across all the mentor areas and both wealth groups. Bendera/Ngilai, which is on the periphery

of Baragoi and the only mentor area next to a large town, registered the lowest average involvement rate in livestock activities (62%); proximity to the urban centre seems to offer access to a wider variety of livelihood options including salary work, petty trading and casual labour. Such a dynamic is also evident in the decline in the number of pastoralists involved in livestock activities as one moves from Lesirkan and Latakweny towards Baragoi (Bendera/Ngilai) and an increase in proportion of the population involved in wage/salaried activities and petty trading.

Casual labour is more prevalent among the poor as compared to the vulnerable. The opposite is true for farming activities, reflecting a positive relationship between wealth and farming activities.

Figure 2: Income generating activities by mentor area and wealth, with the poor represented on the left and the vulnerable represented on the right



Income generated

Households also reported earnings related to each of the income activities that they participated in Table 6, row 1–7). We also imputed the value of home-produced and home-consumed milk and slaughtered animals ((Table 6, row 8).

Table 6: Annual income

	Poor		Vulnerable	
Source	Mean	SD	Mean	SD
Earnings from:				
Sale of livestock (KSH)	19,172	29,833	29,100	36,606
Sale of livestock products (KSH)	471	3,220	1,116	5,973
Sale of crops (KSH)	186	1,772	194	2,101
Salaried employment (KSH)	3,154	22,920	18,343	105,129
Casual labour (KSH)	4,068	12,743	1,638	7,428
Business, shops, and petty trading (KSH)	9,978	24,311	16,065	45,254
Other major sources of incomes excluding gifts and remittances (KSH)	789	5,271	488	3,533
Income from home production and consumption of meat and milk (KSH)	22,150	35,683	31,908	42,490
Total (KSH)	59,968	69,055	98,852	133,807
USD/person/day	0.32	0.33	0.47	0.57
Ratio below USD1.00/person/day	0.96		0.90	

Note: USD1 = KSH105

We observed higher average earnings and total income among the vulnerable than the poor. However, there was a great deal of variability in both groups as indicated by the high standard deviations. In total, about 70% and 63% of household

income is related to livestock and their by-products for the poor and vulnerable households, respectively. Income from home produced and consumed milk and meat is also a larger portion of income among the poor than the vulnerable.

As expected, the poverty rates among the poor are extremely high (96%), and while they are still high among the vulnerable (90%) their rate is lower than that of the poor. While these rates may seem unbelievable, recall that (i) we have not included transfers, such as remittances from outside of the household or food aid, and (ii) this is a sample targeted at the poorest 75% of household in each community from a county with a poverty rates of 71.4% (Wiesmann, Kiteme and Mwangi 2016).

Transfers

The survey asked questions on if the household had received transfers and which types—employment programs, food aid, individual transfers, and other aid—over the last 12 months. We defined the four groups as follows.

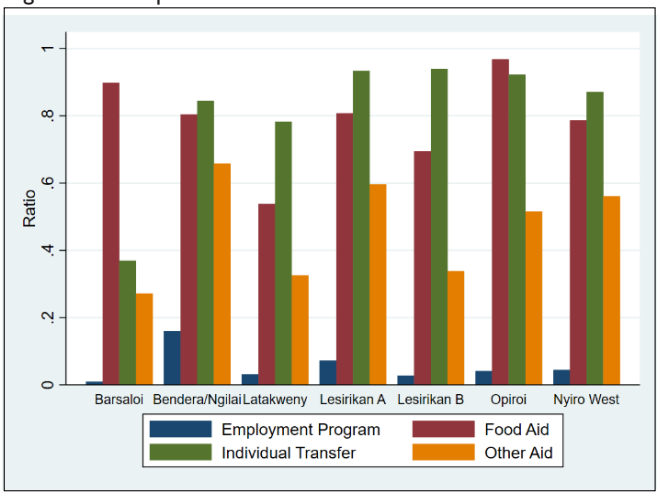
- Employment program: Participation in an employment program that gave food or cash for work.
- Food aid: Direct food aid, such as from the Red Cross or the Kenyan Free School Feeding program.
- Individual transfers: Gifts, transfers, or help from other households or individuals, including from non-household family members who are working or living away from home.
- Other aid: Cash, in-kind transfers or aid from government or organization excluding food aid or livestock aid.

Table 7 summarizes household participation in transfer transactions in the survey sample. Most households receive individual transfers and food aid. Very few households in this region participate in employment programs. Curiously, the wealthier vulnerable household seem moderately more likely to receive food aid (t-statistic = 1.46) and less likely to receive individual transfers (t-statistic = 1.83). We expect that some of these dynamics are driven by the supply nature of food aid rather than demand and look forward to furthering research on the topic.

Table 7: Participation in transfers by transfer type and income

	Ratio reporting transfers		
	Poor	Vulnerable	Total sample
Employment program	0.04	0.06	0.05
Food aid	0.77	0.80	0.78
Individual transfers	0.77	0.72	0.76
Other aid	0.43	0.45	0.43
All four	0.02	0.03	0.02

Figure 3: Participation in transfers



Transfers are not uniformly distributed across the seven mentor areas. For example, employment programs are more than twice as common in Bendera/Ngilai than in other mentor areas and individual transfers are much less common in Barsaloi than in the other mentor areas. There are similar variations in the prevalence of food aid and other aid as well. See Figure 3.

The binary transfer questions were followed by questions aimed at determining the specific types of transfer and total amount of a transfer. Here we examine each separately.

Employment programs

Only 5% of the sample participated in employment programs. Of those that participated, households participated an average of 49 person-days and received an average of KSH331 per day of participation. The average total income from employment programs for these households was KSH15,579 (min=KSH100, max=KSH360,000). This statistic includes three households that reported participating for 300 or more days, which seemed suspect, but the statistic was in person-days, which means that it could be multiple individuals each working less than the 300 days. Seven households reported a daily rate of KSH1,000 or more, which also seemed suspect for an employment program.

Food aid

Of the three categories of food aid, school feeding is the most popular and has the highest value for those that participate (Table 8). Supplementary feeding was nearly non-existent in the 12 months preceding the survey and seemed to favour the vulnerable households.

Table 8. Mean value of transfer received

	Ratio reporting transfers			Mean value (KSH) received if received (standard deviation)		
	Poor	Vulnerable	Total sample	Poor	Vulnerable	Total sample
Food aid	0.54	0.55	0.54	3,158 (4,397)	2,859 (2,604)	3,097 (4,096)
School feeding	0.80	0.81	0.80	12,064 (14,232)	11,784 (11,890)	12,006 (13,773)
Supplementary feeding	0.01	0.01	0.01	2,338 (3,146)	1,350 (1,484)	2,186 (2,927)
Other	0.01	0.01	0.01	3,908 (3,140)	2,000 (1,249)	3,272 (2,732)

Individual transfers

Households were asked about both the types and origin of individual transfers. Households could respond with multiple types and multiple sources for a specific type. Most transfers came from relatives. Cash, livestock, and food were all popular types of transfers. Table 9 summarizes this information.

Table 9: Type and origin of transfers

	Number of respondents				
	Relative	Neighbour/friend	Other	Refuse/Don't know	Total*
Cash	788	125	165	1	1,079
School fees/scholarships	51	12	45	-	108
Livestock	414	74	11	-	499
Food	527	258	52	2	839
Labour	89	111	7	-	207
Assets	11	4			15
Other	1	1	3	-	5
Total	1,881	585	283	3	2,752

Amounts of transfers, conditional on receiving that transfer are summarized in Table 8. Note that although transfers related to school fees are by far the largest, they are also uncommon.

Table 10: Mean transfer by source/origin

	Mean KSH of transfers, conditional on receiving (standard deviation)				
	Relative	Neighbour/ friend	Other	Refuse/ Don't know	Total*
Cash	4,352 (13,971)	3,579 (6,977)	3,575 (7,210)	500 (N/A)	4,058 (12,957)
School fees/scholarships	15,230 (18,145)	16,821 (11,784)	42,049 (76,530)	-	26,512 (52,996)
Livestock	7,134 (10,380)	6,610 (9,389)	14,227 (25,283)	-	7,187 (7,187)
Food	2,449 (4,596)	1,444 (2,148)	2,709 (4,061)	330 (240)	2,248 (4,308)
Labour	3,606 (9,647)	2,855 (8,798)	5,929 (4,011)	-	3,276 (8,624)
Assets	1,690 (2,571)	1,000 (571)	-	-	1,542 (2,290)
Other	2,000 (N/A)	400 (N/A)	10,533 (16,859)	-	6,800 (12,983)

Other aid

Table 11 includes the number of respondents reporting each type of transfer and the mean 12-month average of those transfers, conditional on receiving it.

Table 11: Mean aid conditional on receiving this aid

Transfer type	N	KSH
Orphans and vulnerable children transfer	96	15,098
Persons living with HIV transfer	0	-
Older persons transfer	159	17,291
Persons with severe disability transfer	4	14,000
County fund	111	7,518
Other aid from government agencies	118	7,301
Other aid from NGOs	368	8,420
Emergency fund	1	9,000
Other (specify)	14	15,714

Livestock

Livestock owned and herded

In this section of the survey we asked the respondents about livestock herded and owned by livestock type (Table 12).

Livestock owned is defined as the number of animals inherited from family or given by your family for future inheritance. The number owned also includes the number born from owned animals, animals purchased and those received as gifts and dowry.

Livestock herded includes only those animals that are herded by household members and may include animals loaned to you and animals herded on behalf of someone else.

Table 12: Livestock owned and herded

	Ratio that herd				Mean, conditional on owning/herding (standard deviation)			
	Camel	Cattle	Sheep	Goat	Camel	Cattle	Sheep	Goat
Owned	0.1	0.6	0.5	0.3	1.4 (0.8)	2.7 (3.5)	4.8(4.8)	7.3(8.4)
Herded	0.1	0.6	0.9	0.7	3.4 (3.3)	7.5 (10.4)	8.0 (9.9)	15.3 (16.1)

Most households in our sample herd more livestock than they own, which is consistent with traditional lending practises found in many pastoral communities and the prevalence of absentee animal owners, such as family members that live in the city but maintain a herd in their rural homes.

Herd dynamics

We also asked questions on livestock losses, births, purchases and slaughter among the livestock the households herded between March 2017 and the end of February 2018 (Table 13). This period covered the long rains and long dry season of 2017, the short rain in 2017 and the short dry season that had just ended in 2018.

Table 13: Herd dynamics among herded animals between March 2017 and February 2018

	Ratio that herd				Mean, conditional on herding (standard deviation)			
	Camel	Cattle	Sheep	Goat	Camel	Cattle	Sheep	Goat
Birth	0.1	0.4	0.9	0.5	1.3 (0.7)	3.0 (2.9)	4.1 (3.5)	5.9 (5.5)
Purchase	0.4	0.3	0.4	0.4	1.0 (0.0)	4.0 (9.5)	2.3 (1.4)	4.8 (14.4)
Slaughter	0.1	0.1	0.8	0.4	2.1 (1.1)	4.4 (5.4)	2.6 (2.5)	3.0 (3.0)
Sold	0.8	0.9	0.9	0.9	1.9 (1.5)	3.1 (3.6)	5.4 (5.3)	9.2 (9.6)
Losses	0.1	0.8	0.8	0.7	3.0 (2.6)	9.0 (9.5)	10.7 (11.3)	12.8 (16.6)

Reasons for selling and buying livestock

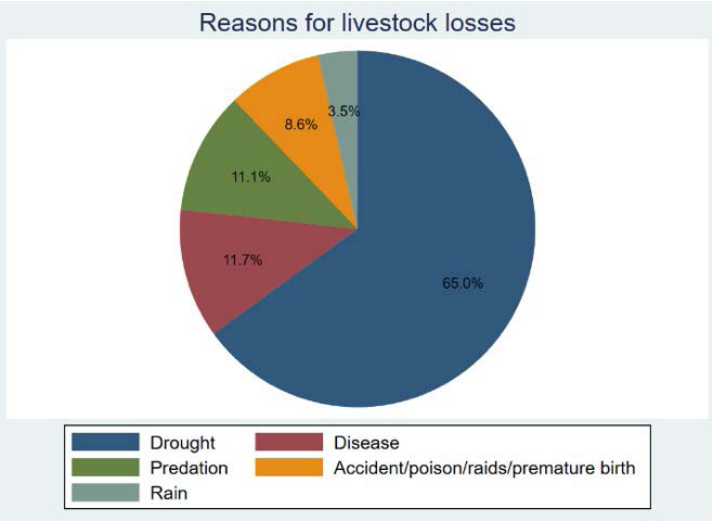
We asked the respondents why they purchased or sold their animals. The most common reason for purchasing livestock was to expand their herds (48%), closely followed by restocking after a drought shock (38%). Other reasons for purchasing animals included consumption, cultural rites, business, and diversification of herd composition.

Reasons for selling livestock included regular cash flow/income (47%), followed by coping with drought effects (38%), and paying school fees (11%). Other reasons for selling livestock included their weakness/performance, helping others, paying debts, spreading risks and starting/sustaining businesses. Of importance to note is how great the impact of drought is: greatly influencing sale of livestock upon its onset and greatly influencing purchases to recover from its impact.

Reasons for livestock losses

Livestock losses can be attributed to different causes. Some reasons can be transient, like in the case of rustling while some can be prolonged like in the case of long droughts. We therefore asked the respondents to characterize the main cause of each animal that they lost. Figure 4 puts these causes into perspective.

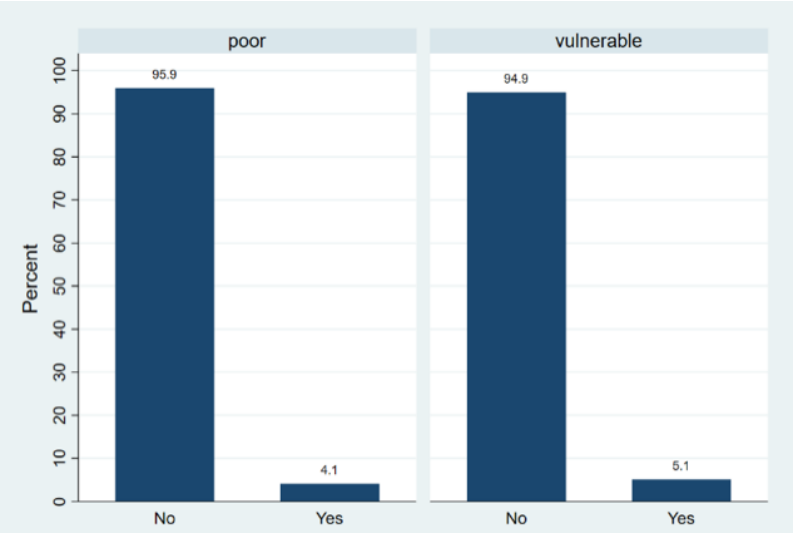
Figure 4: Reasons for livestock loss



Insurance

The insurance sales window opened just before the baseline was collected and continued to be open throughout and after the baseline, but Takaful Insurance of Africa (TIA), the firm selling livestock insurance in the study region, had agreed to delay its main outreach and sales activities for the area until after the baseline was collected. In this section of the survey, we first asked the respondent if they had heard that TIA was selling livestock insurance in Samburu county (Figure). Clearly few participants were aware of the insurance product at the time of the survey.

Figure 5: Respondent awareness of insurance



Conditional on the response being yes, we asked if the household currently had livestock insurance, and if so, how many animals were insured (Table 14). As expected, uptake was very low, and this can be attributed to the lack of information about livestock insurance backed by findings in Figure 5.

Table 14: Respondents purchasing insurance from TIA and mean TLU purchased conditional on knowledge of TIA

	Poor		Vulnerable		Combined	
	Control	Treatment	Control	Treatment	Control	Treatment
% Purchased insurance	3.3	6.3	0.0	0.0	2.4	5.0
Mean TLU insured, conditional on purchasing	0.2	0.8	-	-	0.2	0.8

Cognitive assets and empowerment

The survey contains various sets of questions aimed at assessing the respondents emotional state (CES-D-10, Andresen, Malmgren, Carter and Patrick 1994), perspective of control over decisions, locus of control, and finally an experimental assessment of the respondent's value placed on gaining additional wealth. As an example of the data, Table 15 includes the summary statistics for the CED-D-10 by wealth group, and a test for differences between them. The main takeaway is that many of the participants, 35% show 'significant depressive symptoms' as indicated by the CES-D-10 threshold score of equal to or greater than 10 (Andresen et al. 1994). There does appear to be higher rates of severe depressive symptoms among the poor wealth group and then the vulnerable wealth group.

Table 15. CED-D-10 score summary statistics by wealth group

	Poor	Vulnerable	Difference (poor–vulnerable)	t-statistic (difference!=0)
CES-D-10	8.52	7.74	0.77	2.74
	(0.13)	(0.24)	(0.28)	
Severe depressive symptoms (=1 if CES-D-10>=10)	0.37	0.27	0.10	3.48
	(0.01)	(0.02)	(0.03)	

Standard errors in parenthesis

Food security

Each respondent answered a battery of questions aimed at assessing the foods that they consumed, that their children consumed, and that were consumed by their entire household, using a twenty-four (24) hour recall period and the 16 food categories described by Kennedy, Ballard and Dop (2011) and used by the Food and Agriculture Organization of the United Nations (FAO) to calculate Household Dietary Diversity Score (HDDS) and Women's Dietary Diversity Score (WDDS) and can also be used to calculate Minimum Dietary Diversity (MDD) for children between 6 and 23 months old (WHO 2010). We also asked participants how many days the respondent or children lacked food in the last seven days and a set of questions targeting coping strategies in response to low access to food, which are used to calculate the reduced Coping Strategy Index (rCSI, Maxwell and Caldwell, 2008). Together, these questions should provide a good summary of the household's current food security.

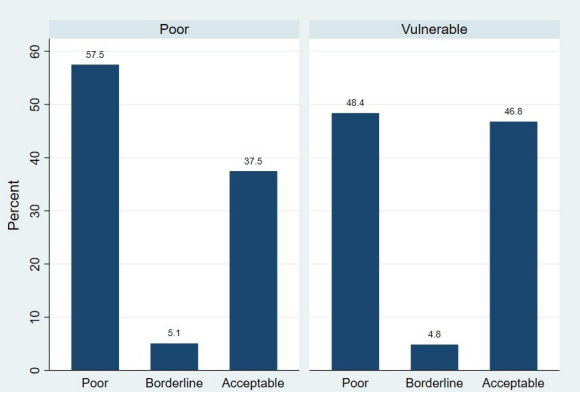
Food consumption score

Respondents were asked about consumption of food groups by themselves, their child, and the entire household. We use responses from these questions to construct a food consumption score (FSC) which is a proxy for determining the current food security for children, women, and the household. The FSC is a composite score that accounts for dietary intake or absence thereof (1 or 0 in our case) and relative nutrition importance of different food groups. The FCS is usually calculated using information collected through seven-day recall, so this indicator is not comparable with other FCS measures but will be internally valid. See WFP (2008) for more information on the FCS.

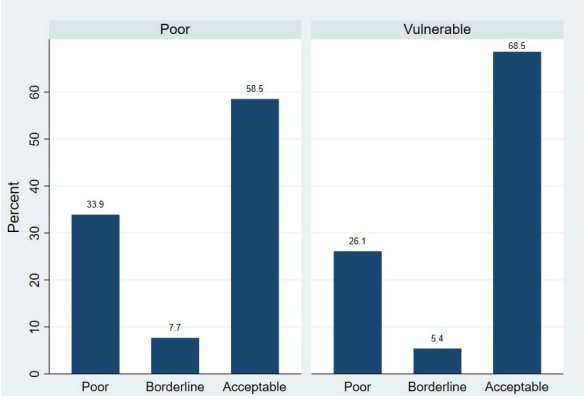
The score was then categorized[8]. Figure 6 represents these results aggregated by the wealth class of the respondents.

Figure 6: Current food security for children (a), women (b) and the household (c).

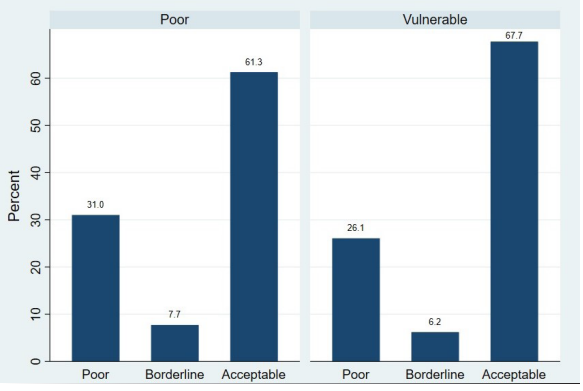
a. Children



b. Women



c. Household



8. Food consumption categories (24-hr recall): FCS<=3: poor consumption, 3<FCS<=5: borderline consumption and FCS>5: acceptable consumption.

From this figure, it is observed that current food security was much lower among children compared to women and the entire household. Among poor households, 60% of children were classified under poor consumption compared to women and the entire household at 36% and 35%, respectively, for the same wealth group.

Dietary diversity scores

The survey included questions on household, respondent, and child consumption. We used the 16 food groups adopted by the FAO and used it to calculate the household's dietary diversity score (HDDS) and women's dietary diversity scores (WDDS) as described by Kennedy, Ballard, and Dop (2011). While there are no set thresholds for HDDS or WDDS of adequate or inadequate diet, they are useful for comparing within a population. Comparing across the weight groups, the poor wealth group has statistically significantly lower HDDS (t-statistic=-4.24, p-value<0.001) and WDDS (t-statistic=-2.77, p-value=0.003) indicating once again that the allocation of households across wealth groups did correspond to relevant outcomes at the household level.

Table 16. Household dietary diversity (HDDS) and Women Dietary Diversity Score (WDDS) by wealth group

	Poor	Vulnerable	Difference	t-statistic
			(poor–vulnerable)	(difference!=0)
HDDS	3.06	3.33	-0.27	-4.24
	(0.03)	(0.06)	(0.06)	
WDDS	1.96	2.10	-0.13	-2.77
	(0.02)	(0.06)	(0.05)	

4. Conclusion

A second survey panel—the midline—will be collected from the same households in January and February of 2020. By that time, we expect that nearly 500 households will have been enrolled in the REAP program and over 100 will have graduated, and households will have had four different opportunities to purchase livestock insurance and might have received insurance payments. We expect the coming midline will provide some indication of the impacts of these programs as well as the dynamics of households living in Samburu county more generally.

References

Andresen, E.M., Malmgren, J.A., Carter, W.B. and Patrick, D.L. 1994. Screening for depression in well older adults: Evaluation of a short form of the CES-D. *American Journal of Preventive Medicine* 10(2): 77–84.

Gobin, V.J., Santos, P. and Toth, R. 2016. *Poverty graduation with cash transfers: a randomized evaluation*. Monash Economics Working Papers 23, p.16. Monash University, Department of Economics.

Janzen, S.A. and Carter, M.R. 2018. After the drought: The impact of microinsurance on consumption smoothing and asset protection. *American Journal of Agricultural Economics*101(3): 651–671.

Jensen, N.D., Barrett, C.B. and Mude, A.G. 2017. Cash transfers and index insurance: A comparative impact analysis from northern Kenya. *Journal of Development Economics* 129: 14–28.

Jensen, N.D., Mude, A.G. and Barrett, C.B. 2018. How basis risk and spatiotemporal adverse selection influence demand for index insurance: Evidence from northern Kenya. *Food Policy* 74: 172–198.

Kennedy, G., Ballard, T. and Dop, M.C. 2011. *Guidelines for measuring household and individual dietary diversity.* Rome, Italy: Food and Agriculture Organization of the United Nations.

Matsuda, A., Takahashi, K. and Ikegami, M. 2019. *Direct and indirect impact of index-based livestock insurance in southern Ethiopia.* Geneva Papers on Risk and Insurance—Issues and Practice 44: 481–502.

Maxwell, D. and Caldwell, R. 2008. *The Coping Strategies Index: A tool for rapid measurement of household food security and the impact of food aid programs in humanitarian emergencies.* Field Methods Manual. Second edition.

Wiesmann, U., Kiteme, B. and Mwangi, Z. 2016. *Socio-economic atlas of Kenya: Depicting the national population census by county and sub-location.* Second, revised edition. Nairobi, Kenya.

WFP (World Food Programme). *2008. Food consumption analysis: Calculation and use of the food consumption score in food security analysis.*

WHO (World Health Organization). 2010. Indicators for assessing infant and young child feeding practices. Part 11: Measurement. Available from https://www.who.int/nutrition/publications/infantfeeding/9789241599290/en/

Zhang, W., O'Brien, N., Forrest, J.I., Salters, K.A., Patterson, T.L. et al. 2012. Validating a shortened depression scale (10 item CES-D) among HIV-positive people in British Columbia, Canada. *PloS One* 7(7): p.e40793.

92–9146–607–7

The International Livestock Research Institute (ILRI) works to improve food and nutritional security and reduce poverty in developing countries through research for efficient, safe and sustainable use of livestock. Co-hosted by Kenya and Ethiopia, it has regional or country offices and projects in East, South and Southeast Asia as well as Central, East, Southern and West Africa. ilri.org

CGIAR is a global agricultural research partnership for a food-secure future. Its research is carried out by 15 research centres in collaboration with hundreds of partner organizations. cgiar.org