



# Decentralized Evaluation

## Evaluation of the Satellite Index Insurance for Pastoralists in Ethiopia (SIPE) Programme: Impact Evaluation of the SIPE Pilot (2017 – 2019)

### Annexes

August 2019  
WFP Country Office Ethiopia  
Evaluation Manager: Roberto Borlini

Prepared by  
Prof. Markus Frölich, Team Leader, Center for Evaluation and Development (C4ED)  
Dr. Marian Meller, Senior Evaluator, Particip GmbH  
Dr. Asmus Zoch, Evaluator, Center for Evaluation and Development (C4ED)  
Dr. Giulia Montresor, Evaluator, Center for Evaluation and Development (C4ED)  
With support of Katharina Kreutz, Center for Evaluation and Development (C4ED)

## **DISCLAIMER**

The opinions expressed in this report are those of the Evaluation Team, and do not necessarily reflect those of the World Food Programme. Responsibility for the opinions expressed in this report rests solely with the authors. Publication of this document does not imply endorsement by WFP of the opinions expressed.

The designation employed and the presentation of material in maps do not imply the expression of any opinion whatsoever on the part of WFP concerning the legal or constitutional status of any country, territory or sea area, or concerning the delimitation of frontiers.

## Table of Contents

<b>ANNEX 1: EVALUATION DESIGN AND METHODOLOGY .....</b>	<b>1</b>
A1-a: SIPE locations .....	2
A1-b: Impact evaluation matrix.....	3
A1-c: Theory of change .....	7
A1-d: Map of <i>kebeles</i> by treatment group.....	8
A1-e: Propensity score matching .....	9
A1-f: Fieldwork activities and data collection .....	15
A1-g: Sampling.....	18
A1-h: Sample attrition .....	21
<b>ANNEX 2: SUMMARY STATISTICS .....</b>	<b>24</b>
<b>ANNEX 3: SIPE IMPACT ESTIMATES .....</b>	<b>43</b>
<b>ANNEX 4: BIBLIOGRAPHY.....</b>	<b>57</b>

## List of tables

Table I: Impact evaluation matrix .....	3
Table II: First stage of propensity score estimation of selection into SIIPE – alternative specifications .....	10
Table III: Matching quality for the overall sample.....	13
Table IV: Matching quality by variable.....	14
Table V: Baseline sample .....	18
Table VI: Qualitative endline sample.....	20
Table VII: Attrition rates by treatment group .....	22
Table VIII: Reason for attrition by treatment group.....	22
Table IX: Endline values for EQ 1: Behavioural change .....	25
Table X: Endline values for EQ 2: Insurance awareness & understanding, financial literacy .....	28
Table XI: Endline values for Sub-EQ 3.1: Planned payout use .....	30
Table XII: Endline values for Sub-EQ 3.3: Livestock accounting: stocks; losses .....	31
Table XIII: Endline values for Sub-EQ 3.3: Livestock accounting: offtakes .....	33
Table XIV: Endline values for Sub-EQ 3.4: Livestock accounting: sales.....	35
Table XV: Endline values of selected outcome indicators for EQ 4.....	37
Table XVI: Endline values of outcome indicators by gender of HH head .....	39
Table XVII: Values for mobile banking use based on HelloCash secondary data .....	42
Table XVIII: Programme effects on Sub-EQ 1.1: Livestock-related investments.....	44
Table XIX: Programme effects on Sub-EQ 1.3 – 1.5.....	46
Table XX: Programme effects on Sub-EQ 2.1: Awareness and understanding of insurance and SIIPE .....	48
Table XXI: Programme effects on Sub-EQ 2.2 and 2.4.....	49
Table XXII: Programme effects on Sub-EQ 3.3: Livestock losses .....	50
Table XXIII: Programme effects on Sub-EQ 3.3: Livestock offtakes.....	52
Table XXIV: Programme effects on Sub-EQ 3.4: Livestock sales .....	54
Table XXV: Programme effects on Sub-EQ 4.2: Minimum Dietary Diversity of Women (MDDW).....	56

## List of figures

Figure I: Map of SIIPE pilot districts ( <i>woredas</i> ) and communities ( <i>kebeles</i> ).....	2
Figure II: SIIPE theory of change .....	7
Figure III: Location of SIIPE pilot districts and study communities ( <i>kebeles</i> ).....	8
Figure IV: Common support - distribution of propensity scores.....	12



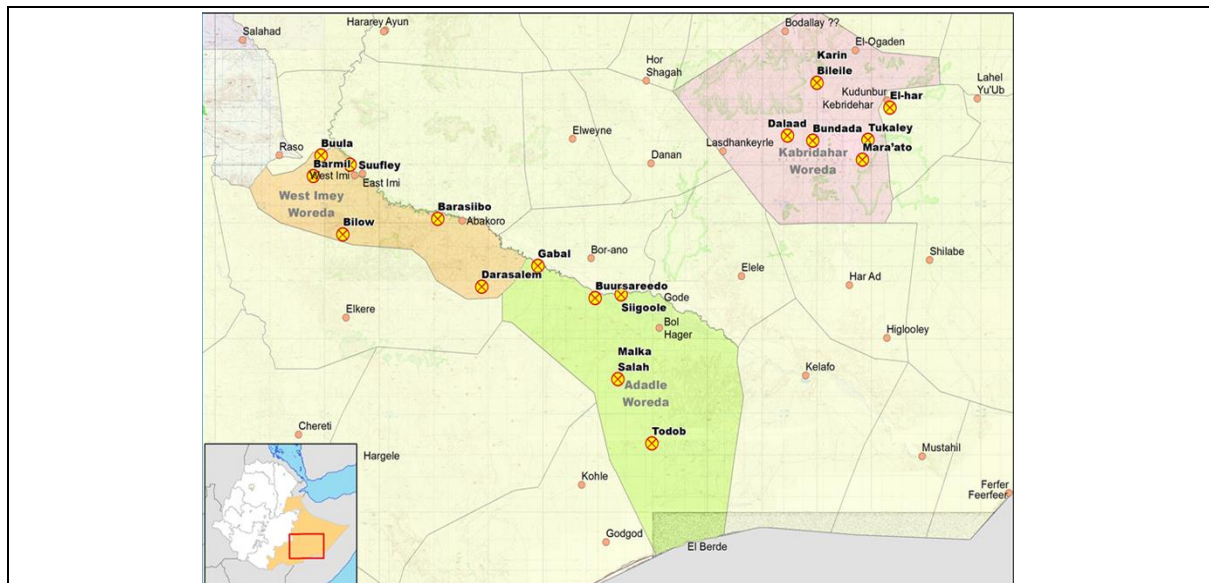
## **List of acronyms**

BoLPD	Bureau of Livestock and Pastoral Development
C4ED	Center for Evaluation and Development
DS	Direct Support Beneficiaries
EQ	Evaluation questions
ET	Evaluation team
ETB	Ethiopian Birr
ETHCO	Ethiopia Country Office
FAO	Food and Agriculture Organization of the United Nations
FGD	Focus group discussion
HFIAS	Household Food Insecurity Access Score
HH	Household
ICC	Intra-cluster correlation
IDI	In-depth interviews
ILRI	International Livestock Research Institute
KII	Key informant interview
KM	Kernel matching
MDD-W	Minimum dietary diversity for women
MUAC	Mid-upper arm circumference (MUAC)
NGO	Non-governmental organisation
NN	Nearest neighbour
PC	Pure Control (Group)
PSM	Propensity score matching
PSNP	Productive Safety Net Program
PW	Public Works Beneficiaries
ROSCA	Rotating savings and credit association
SC	SIPE Control (Group)
SIPE	Satellite Index Insurance for Pastoralists in Ethiopia
ST	SIPE Treatment (Group)
Std. dev.	Standard deviation
TLU	Tropical Livestock Units
UN	United Nations
USD	United States Dollar
WFP	World Food Programme
WTP	Willingness to pay

## **ANNEX 1: EVALUATION DESIGN AND METHODOLOGY**

## A1-a: SIPE locations

**Figure I: Map of SIPE pilot districts (*woredas*) and communities (*kebeles*)**



Note: SIPE pilot *woredas* are highlighted as coloured areas. Pilot *kebeles* are marked with ⊗.

Source: WFP ETHCO.



## A1-b: Impact evaluation matrix

**Table I: Impact evaluation matrix**

Area of impact	EQ	Sub-EQ	Quantitative Outcome/impact indicators	Qualitative Outcome/impact indicators
Behavioural changes	1. To which extent (and how) has SIIPE affected productive decisions and livelihoods of beneficiary households?	1.1 What has been the impact of SIIPE on benefiting pastoralists' investments in livestock and other productive assets?	<ul style="list-style-type: none"> <li>• <i>Total livestock-related expenditure*</i></li> <li>• <i>Expenditure on livestock*</i></li> <li>• <i>Expenditure on forage or fodder*</i></li> <li>• <i>Expenditure on water, veterinary services/medicine, etc*.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Type of investment</li> <li>• Reason for investment</li> <li>• Timing of investment</li> <li>• Challenges encountered with investment</li> </ul>
		1.2 To which extent have pastoralists obtained better access to socioeconomic assets and infrastructure that enhance their livelihoods?	<ul style="list-style-type: none"> <li>• Asset ownership*</li> <li>• Asset index*</li> </ul>	<ul style="list-style-type: none"> <li>• Enforcement of public work activities</li> <li>• Involvement in public work activities</li> <li>• (Perceived) benefits from public work activities</li> </ul>
		1.3 What has been the effect of SIIPE on distress sales of productive and consumption assets?	<ul style="list-style-type: none"> <li>• <i>Distress sales of livestock*</i></li> <li>• <i>Coping mechanisms during drought*</i></li> </ul>	<ul style="list-style-type: none"> <li>• Coping mechanisms (livestock sales, food intake, loan-taking, etc.)</li> <li>• Reasons for the choice of specific mechanisms</li> <li>• Best practice coping mechanism</li> </ul>
		1.4 How has SIIPE changed beneficiary households' (and their individual members') engagement in alternative livelihood and income sources?	<ul style="list-style-type: none"> <li>• <i>Income diversification (number of income/ livelihood sources) *</i></li> <li>• <i>Value/amount of income received from various activities *</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Involvement in public work activities (see 1.2)</i></li> <li>• <i>Sources of income/livelihood</i></li> </ul>
		1.5 Has SIIPE ultimately led to more stable household incomes among its beneficiaries?	<ul style="list-style-type: none"> <li>• <i>Composition of income sources*</i></li> <li>• <i>Reported time periods of no-income*</i></li> <li>• <i>Income share of 'stable' sources*</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Existence of alternative income sources complimentary to pastoralism</i></li> <li>• <i>Access to stable income sources</i></li> <li>• <i>Income stability throughout the year</i></li> </ul>

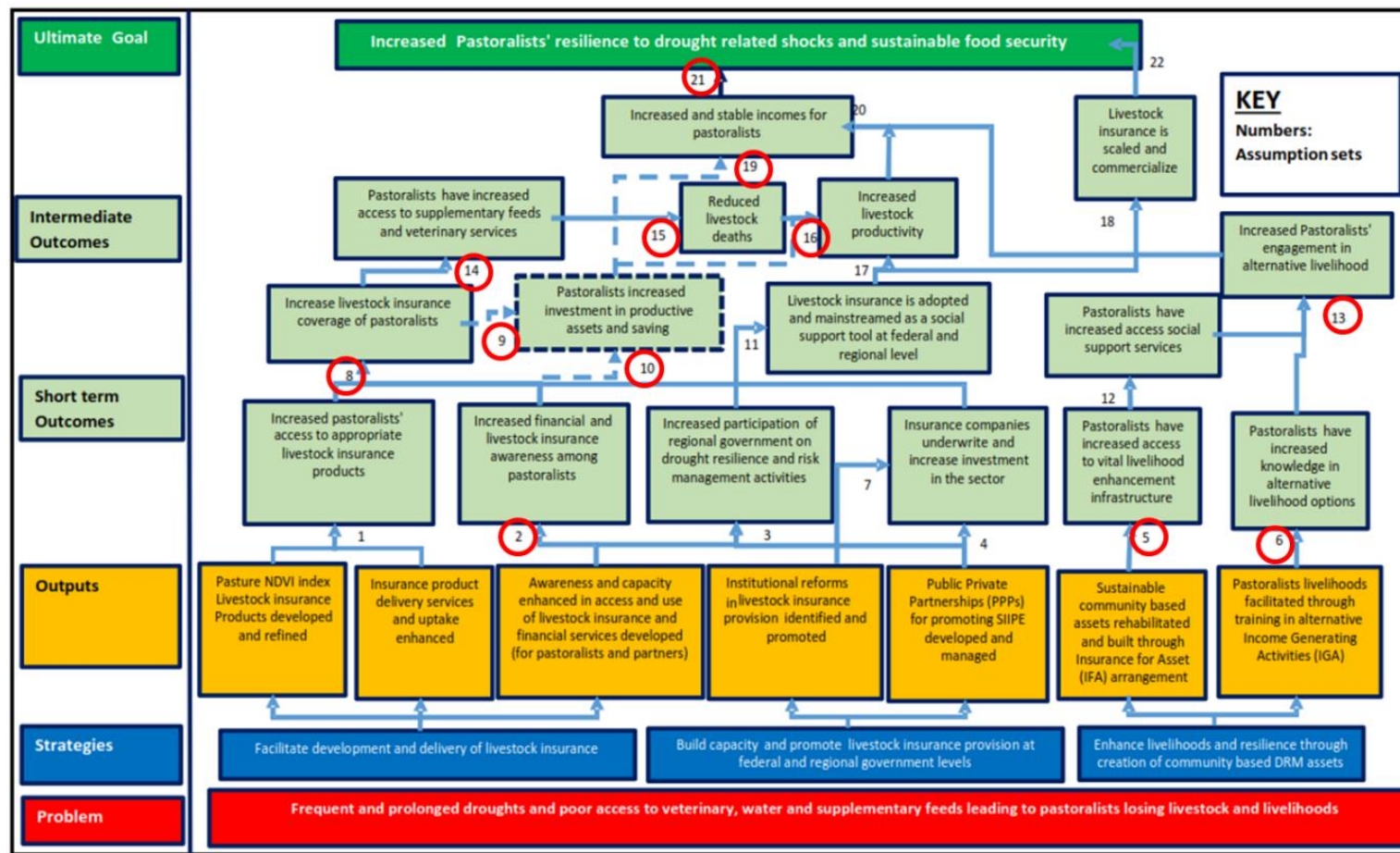
Area of impact	EQ	Sub-EQ	Quantitative Outcome/impact indicators	Qualitative Outcome/impact indicators
		1.6 To which extent have disadvantaged and vulnerable members of pastoralist families benefitted from improved income and protection within their households?	<ul style="list-style-type: none"> <li>• Share of children enrolled in school absent from school, drop outs *</li> <li>• <i>Share of children working*</i></li> <li>• <i>Share of children in early marriage*</i></li> <li>• <i>Nutritional status of children under 5 years*</i></li> </ul>	
Financial literacy and insurance awareness	2. Have programme activities and services led to improved awareness, understanding or use of insurance and financial tools and products?	2.1 How well do pastoralists understand SIIPE as an insurance product, and how does training and capacity building under the programme contribute to this awareness?	<ul style="list-style-type: none"> <li>• <i>General insurance knowledge index</i></li> <li>• <i>SIIPE-specific knowledge index</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Understanding of general insurance and livestock insurance in particular</i></li> <li>• <i>Availability of, access to and utilization of awareness building measures</i></li> <li>• <i>Design and execution of capacity building measures</i></li> </ul>
		2.2 To which extent are pastoralists willing to pay for the partially subsidised insurance coverage and for livestock insurance in general?	<ul style="list-style-type: none"> <li>• <i>Willingness to pay for livestock insurance estimates (per animal category and per TLU) *</i></li> </ul>	<ul style="list-style-type: none"> <li>• General willingness to pay</li> <li>• Reasons for willingness to pay</li> </ul>
		2.3 How has SIIPE affected financial coping mechanisms of households in periods of distress?	<ul style="list-style-type: none"> <li>• <i>Number of households having access and use of financial services: mobile banking, bank accounts</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Use of financial coping in form of borrowing/loan</i></li> </ul>
		2.4 To which extent have beneficiary households improved and diversified their access to - and actual use - of financial services (e.g. microcredit)?	<ul style="list-style-type: none"> <li>• <i>Number of financial services used by households: mobile banking, bank accounts</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Availability and access to mobile banking account</i></li> <li>• <i>Use of mobile banking account</i></li> <li>• <i>Alternatives to mobile banking</i></li> <li>• <i>(Dis)advantages of mobile banking</i></li> </ul>

Area of impact	EQ	Sub-EQ	Quantitative Outcome/impact indicators	Qualitative Outcome/impact indicators
Livestock protection	3. To which extent (and how) has SIPE strengthened the ability of pastoralists to keep their animals alive?	3.1 For which household expenses do beneficiaries use the insurance pay-outs?	In addition to livestock expenditures (1.1), specific indicators for beneficiaries are: <ul style="list-style-type: none"> <li>• <i>Share of payout used for specific household/livestock related needs *†</i></li> <li>• <i>Share of payout planned to be used for specific household/livestock related needs†</i></li> </ul>	
		3.2 What has been the impact of SIPE, through payouts or other mechanisms, on beneficiaries' purchases of feeds and veterinary services?	In addition to livestock-related expenditures (1.1), specific indicators for beneficiaries are: <ul style="list-style-type: none"> <li>• <i>Share of payout used for livestock related activities *†</i></li> <li>• <i>Share of payout planned to be used†</i></li> </ul>	
		3.3 To which extent has the programme reduced livestock deaths and affected livestock off-take?	<ul style="list-style-type: none"> <li>• <i>Total number and value of livestock deaths and offtakes*</i></li> <li>• <i>Timing of livestock deaths and offtakes*</i></li> </ul>	
		3.4 How have insurance payouts under SIPE affected pastoralists' livestock sales?	<ul style="list-style-type: none"> <li>• <i>Total number and value of livestock sales *</i></li> <li>• <i>Timing of livestock sales*</i></li> </ul>	
Food security	4. Has the food security of pastoralists and their families improved as a	4.1 What is the effect of SIPE on the likelihood that members of beneficiary households (especially women & children) have insufficient meals per day?	<ul style="list-style-type: none"> <li>• <i>Household food insecurity access score*</i></li> <li>• <i>Household frequency of insufficient meals*</i></li> <li>• <i>Nutritional status of children under 5 years*</i></li> </ul>	

<b>Area of impact</b>	<b>EQ</b>	<b>Sub-EQ</b>	<b>Quantitative Outcome/impact indicators</b>	<b>Qualitative Outcome/impact indicators</b>
	consequence of the programme?	4.2 How have households diversified their diets due to their involvement in SIIPE?	• <i>Household dietary diversity Index*</i>	
		4.3 To which extent have SIIPE households changed their level or composition of food expenditure?	• <i>Household food consumption expenditure share of total expenditure and composition*</i>	
* Programme effects on indicators that are unlikely to be identified (or measured) without a drought or payout.				
† Indicators measured for beneficiary households only.				

## A1-c: Theory of change

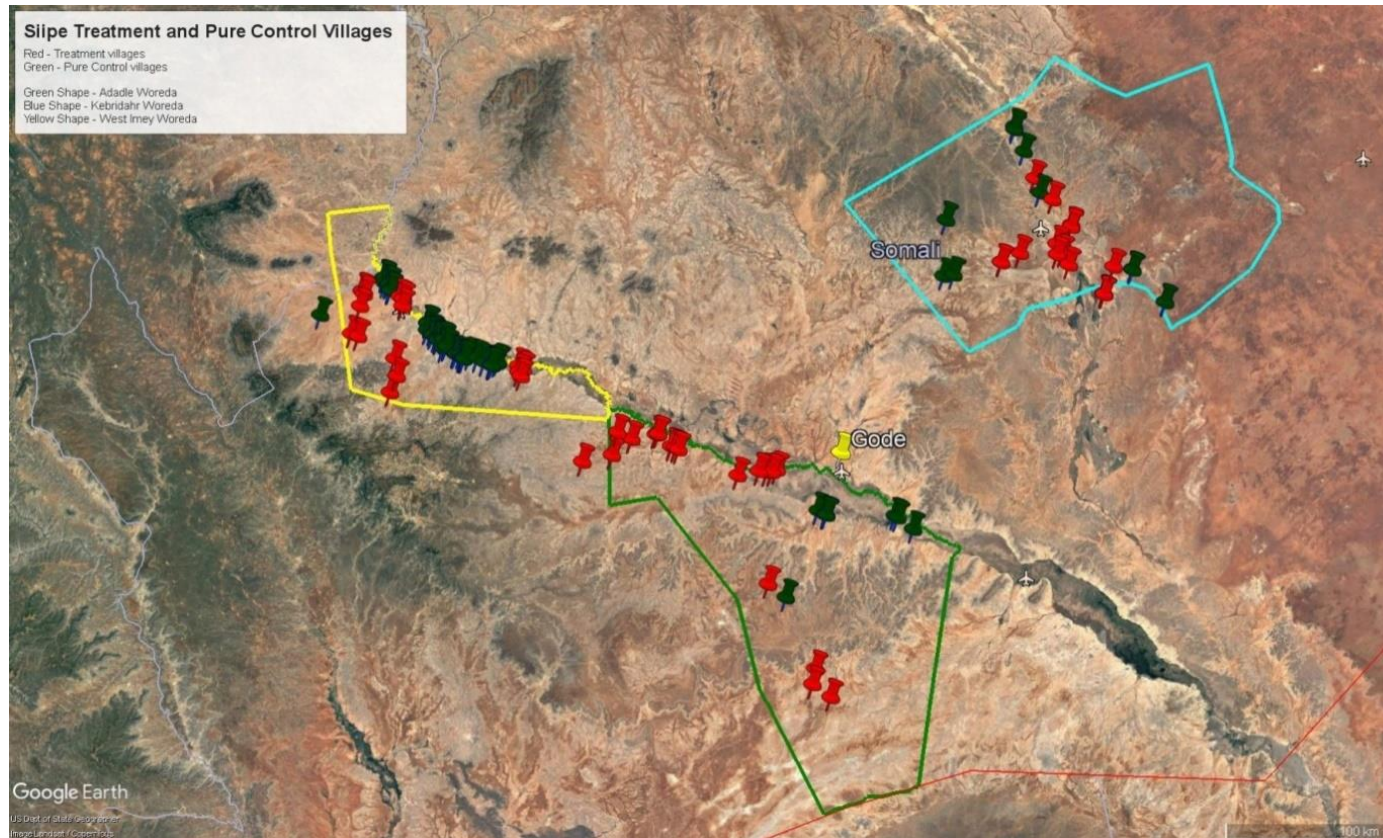
Figure II: SIPE theory of change



Note: Circles in red indicate those logical links that are (at least partially) addressed by the list of EQs and sub-EQs in the previous impact evaluation). Source: SIPE Theory of Change. WFP, August 2017.

### A1-d: Map of *kebeles* by treatment group

**Figure III: Location of SIPE pilot districts and study communities (*kebeles*)**



*Notes:* Red pins denote SIPE pilot *kebeles* with SIPE Treatment and SIPE Control Households. Dark green pins denote additional control *kebeles* with Pure Control households.

*Source:* C4ED and WFP ETHCO data.

### **A1-e: Propensity score matching**

In contrast to randomized controlled trials (RCT), any quasi-experimental approach rests on (often untestable) assumptions about the process of the selection of the SIIPE communities and their comparability with the control communities and households. The PSM estimator controls for differences in observed characteristics but cannot account for differences in unobserved characteristics between communities or villages (sub-kebeles). That is, even though some sub-kebele characteristics were included in the matching, there could be a concern of systematic infrastructure or climate differences between ST and PC (sub-)kebeles that were not captured in the data. The data do not allow for gauging the possible direction of bias (if any). However, the identification of comparable PC kebeles was done together with WFP and the district administrations to minimise estimation bias.

The similarity of ST and PC units is examined in the propensity score estimation in Table II below. The results are robust to the choice of different specifications, which suggests that ST and PC units are on average similar at the baseline. The table shows the results of the first step of the PSM procedure, which regresses actual treatment on alternative sets of baseline household characteristics (socioeconomic variables, assets, PSNP status, number of TLUs, etc.) and sub-kebele (village) characteristics (e.g. distance to the closest livestock and regular market, and to the closest mobile banking agent). Increasing the number of characteristics does not increase explanatory power.

Overall, it appears that observed characteristics are, on average, not too different between treatment and matched control households. As in any non-experimental study, one can never rule out that there might be large differences in characteristics that are not observed, but the finding that systematic observed differences are not huge is reassuring.

Propensity matching imposes a further requirement: the existence of common support, which means that each SIIPE beneficiary must have a counterpart with a similar propensity score in the Pure Control group. Figure IV further below displays the distribution of the propensity scores and shows a good overlap.

The quality of matching (comparability of PC with ST households) can be assessed with a number of indicators suggested in the literature (Sianesi, 2004; Caliendo and Kopeinig, 2005). The results are shown in Tables III and IV further below. Both matching estimators meet the commonly accepted matching quality standards. After matching, the ST-PC sample is balanced.

**Table II: First stage of propensity score estimation of selection into SIPE – alternative specifications**

	(1)	(2)	(3)	(4)
	ST-PC	ST-PC	ST-PC	ST-PC
<u>Household characteristics</u>				
Age of household head	-0.004 (0.004)	-0.002 (0.004)	-0.002 (0.004)	-0.003 (0.004)
Female household head	0.037 (0.104)	-0.077 (0.119)	-0.027 (0.109)	-0.028 (0.109)
Household size	0.056*** (0.018)	0.086*** (0.024)	0.054*** (0.019)	0.055*** (0.019)
Household is Direct Support	0.140 (0.157)	0.160 (0.172)	0.168 (0.165)	0.182 (0.164)
Total TLU owned by household	-0.029 (0.025)	-0.043 (0.027)	-0.025 (0.026)	-0.026 (0.026)
Household head is pastoralist	0.430*** (0.094)	0.310* (0.166)	0.317*** (0.099)	0.323*** (0.099)
Household is permanently settled	-1.181*** (0.247)	-1.128*** (0.259)	-1.284*** (0.250)	-1.282*** (0.250)
Household is partially settled	-0.833*** (0.273)	-0.747*** (0.288)	-0.878*** (0.277)	-0.877*** (0.277)
Household owns phone	0.078 (0.113)	0.112 (0.123)	0.036 (0.118)	0.035 (0.118)
Household has mattress	-0.217** (0.104)	-0.291** (0.114)	-0.175 (0.108)	-0.179* (0.108)
Household has toilet	-0.332*** (0.119)	-0.270** (0.131)	-0.343*** (0.121)	-0.343*** (0.121)
House has natural walls	0.307 (0.188)	0.439** (0.212)	0.224 (0.203)	0.227 (0.203)
House has natural roof	-0.233 (0.156)	-0.287* (0.175)	-0.132 (0.170)	-0.136 (0.170)
Adadle woreda	0.419*** (0.123)	0.376*** (0.136)	-0.073 (0.175)	-0.069 (0.175)
Kabridehar woreda	0.687*** (0.125)	0.559*** (0.139)	1.797*** (0.205)	1.761*** (0.197)
Household head has education		-0.099 (0.108)		
Household head is monogamously married		-0.032 (0.230)		
Household head is polygamously married		-0.146 (0.270)		
Number of boys		0.007 (0.036)		
Number of children out of school		-0.055 (0.040)		
Household head is agro-pastoralist		-0.155 (0.177)		
Household owns agricultural land		-0.154 (0.110)		



	(1)	(2)	(3)	(4)
	ST-PC	ST-PC	ST-PC	ST-PC
<i>Sub-kebele characteristics</i>				
Distance (hour) from general market			-0.223*** (0.036)	-0.212*** (0.032)
Distance (hour) from livestock market			-0.124*** (0.047)	-0.105*** (0.037)
Distance (hour) from veterinary services			0.030 (0.043)	
Distance (hour) from mobile banking agent/shop			0.236*** (0.050)	0.232*** (0.049)
Constant	0.402 (0.388)	0.362 (0.487)	0.596 (0.410)	0.598 (0.410)
Observations	848	749	848	848
Pseudo R <sup>2</sup>	0.138	0.146	0.211	0.210

Source: C4ED analysis of baseline data.

Notes: All the variables were retrieved via household survey, except in part for the TOTAL TLU variable. This variable indicates the TLU stock in October 2017. At the inception of the evaluation, the SIIPE beneficiary households were already determined eligible and selected as from WFP listings that occurred in October 2017. The TLU eligibility for Pure Control households was established in the field via recall during the baseline survey.

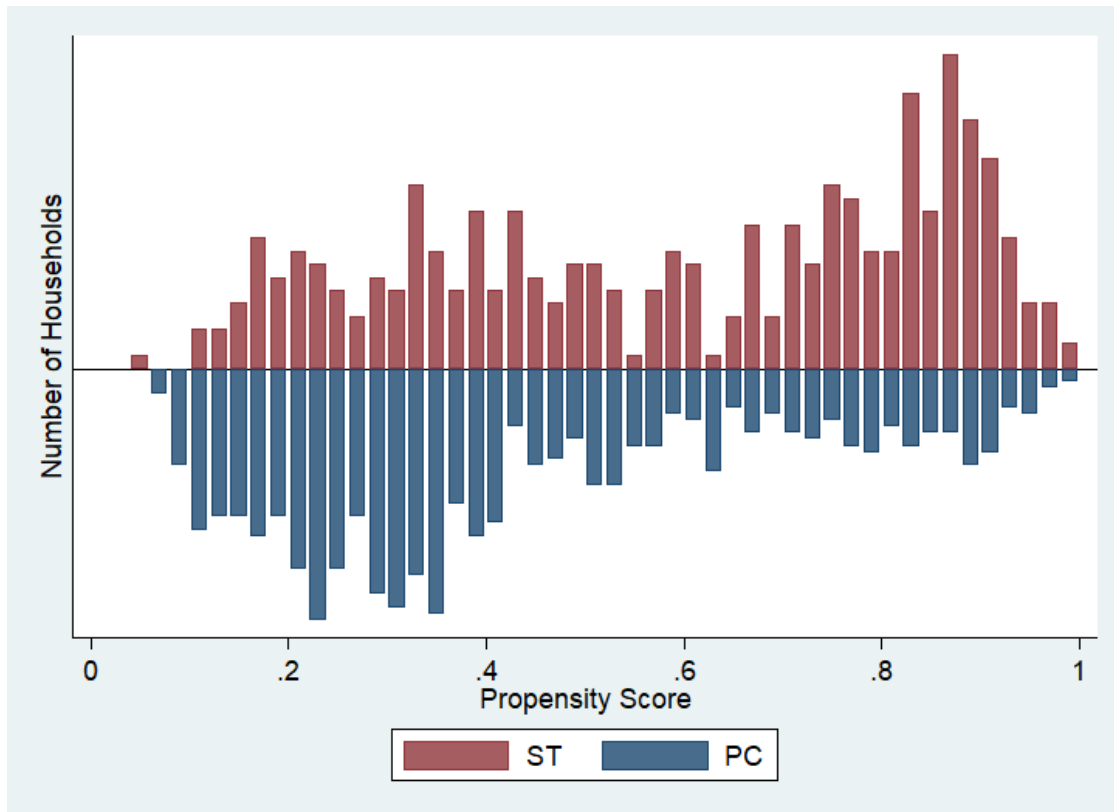
The dummy variables are indicated with \*. The omitted categories for the respective dummy variables are:

- Female household head: Male headed household
- Household head has education: no education
- Household head is monogamously married: never married, married (polygamy), divorce/separated, widowed
- Household head is polygamously married: Never married, married (monogamy), divorce/separated, widowed
- Direct support: no
- Household head is Pastoralist: other, agropastoralist, crop farming/ sale of crop, salaried employment, casual labour, business and petty trading, unpaid work in family's shop/ business, house wife, looking for job, not working, cannot work (too young, too old, sickness)
- Household head is agropastoralist: other, livestock herding/livestock production, crop farming/ sale of crop, salaried employment, casual labour, business and petty trading, unpaid work in family's shop/ business, house wife, looking for job, not working, cannot work (too young, too old, sickness)
- Household owns agricultural land: no
- Household is permanently settled: partially settled, nomadic
- Household is partially settled: permanently settled, nomadic
- Household owns phone: no phones
- House has mattress: no mattresses
- Household has toilet: no toilet facility
- Household has natural walls: rudimentary walls, finished walls
- House has natural roofs: rudimentary roofing, finished roofing
- Adadle woreda: Kebridehar, West Imey
- Kebridehar woreda: Adadle, West Imey

The choice between the four models was based on the statistical significance of the estimated coefficients and the (pseudo)R<sup>2</sup>-coefficient, which measures the variation in SIIPE participation between households that is explained by the household and sub-kebele characteristics included in the model. Since the coefficients of the additional variables in the second specification do not show any statistical significance (they are also not jointly significant) and barely add to the pseudo R<sup>2</sup>, it was ultimately decided to use the PSM model without these additional variables for further impact analysis. In contrast, the sub-kebele characteristics do add to the R<sup>2</sup> and were thus maintained in the first stage of the PSM estimates in the further analysis. Adding the variable on distance to veterinary services does only marginally contribute to the pseudo R<sup>2</sup>, hence, it was decided to apply model (4) for the estimation of the propensity scores. What is important is not the magnitude of the Pseudo R<sup>2</sup>, but rather that the

unexplained variation in SIIPE participation is not due to systematic differences between the two groups. In the assessment of the matching quality (further below) it is shown that, after the matching, the value reduces to 0, which is a sign that there are no systematic differences in the distribution of the covariates used for the matching.

**Figure IV: Common support - distribution of propensity scores**



Choice and quality of the specific PSM estimators for the analysis

The analysis applies two PSM estimators: the nearest neighbour (NN) and the kernel matching (KM) estimator, which differ in the number of Pure Control households that are matched against a given SIIPE beneficiary household. The NN estimator is more likely to minimise estimation bias while the KM estimator is expected to yield statistically more precise estimates.

The quality of the alternative matching results is compared further below. As robustness check, we also report alternative estimates of the effects of SIIPE on outcome and impact indicators based on the two different PSM estimators.

When applying the NN matching estimator, one observation from the treatment group is matched with a neighbouring control group observation, defined as the closest control observation based on the propensity score value. To improve precision of the estimates, we used one-on-one NN matching with replacement, which allowed to match one control household to multiple treatment households.

In contrast, the KM estimator matches one treatment household with a weighted average of all the Pure Control households within a given propensity score distance (“bandwidth”) to the treatment household. The assignment of weights (the closer the propensity score of a PC household to the ST household, the higher the weight) is done through a specific function (“kernel” function).

The quality of the previous two estimators refers to the achieved similarity between the comparison and treatment groups in the household characteristics. A number of standard matching quality indicators are shown in Table III for the overall sample and in Table IV for each of the matching variables pre and post-matching under both the KM and NN procedures. Overall the matching quality under both estimators appears good and overall meets the standards proposed by the literature (Caliendo, 2006; Sianesi, 2004). All the indicators point towards evidence of successful matching in that there are no signs of systematic differences between treatment and control based on the matching variables after it.

**Table III: Matching quality for the overall sample**

Matching	Sample	Pseudo	Likelihood	Mean Bias
		R <sup>2</sup>	ratio P-value	(%)
		(1)	(2)	(3)
Kernel	Pre	0.210	0	19.1
	Post	0.075	0	9.2
Nearest Neighbour	Pre	0.210	0	19.1
	Post	0.091	0	9.6

Notes: The table shows three quality indicators for the matching across the overall sample.

Column 1 in Table III shows the Pseudo  $R^2$ , which is reported from the bottom row of the probit model displayed in Table II. From 13.8% the value reduces to almost 0, which means that the variables after the matching are able to explain almost 0 variance of the probability of treatment.

Column 2 reports p-values of the likelihood ratio performed on the full set of matching variables. The p-value clearly indicates that the matching variables are not jointly significant (i.e. are relevant set of explanatory variables) after matching in explaining the probability of treatment.

Column 3 shows the mean absolute standardized bias following Rosenbaum and Rubin (1985), an alternative indicator to assess how much treatment and control households still differ after matching. After the matching the bias reduces to 9.2 - 9.6 percent. This value is slightly higher than the commonly accepted threshold of 5 percent (Caliendo and Kopeinig, 2005).

**Table IV: Matching quality by variable**

Variables	Matched	Sample	Kernel Matching			NN Matching		
			Mean		Mean Bias (%)	Mean		Mean Bias (%)
			ST	PC		ST	PC	
(1)	(2)	(3)	(1)	(2)	(3)			
Age of household head	Pre		41.32	41.69	-2.6	41.32	41.69	-2.6
	Post		41.11	40.74	2.5	41.11	40.51	4.1
Female household head	Pre		0.38	0.29	20.5	0.38	0.29	20.5
	Post		0.38	0.35	6.5	0.38	0.32	11.9
Household size	Pre		7.96	7.42	19.2	7.96	7.42	19.2
	Post		7.87	7.74	4.8	7.87	8.16	-10.3
Direct Support	Pre		0.13	0.09	12.7	0.13	0.09	12.8
	Post		0.13	0.14	-2.6	0.13	0.12	2.5
Total TLU	Pre		7.51	7.68	-9.1	7.51	7.68	-9.1
	Post		7.50	7.62	-6.4	7.50	7.73	-12.7
Household head is pastoralist	Pre		0.64	0.42	45.3	0.64	0.42	45.3
	Post		0.64	0.68	-8.3	0.64	0.68	-7.6
Household is permanently settled	Pre		0.76	0.87	-28.7	0.76	0.87	-28.7
	Post		0.77	0.82	-14.1	0.77	0.78	-4.2
Household is partially settled	Pre		0.14	0.11	8.7	0.14	0.11	8.7
	Post		0.15	0.10	15.1	0.15	0.10	13.5
Household owns phone	Pre		0.75	0.72	6.8	0.75	0.72	6.8
	Post		0.75	0.78	-6	0.75	0.76	-1.2
House has mattress	Pre		0.31	0.44	-26.1	0.31	0.44	-26.1
	Post		0.31	0.32	-1.7	0.31	0.34	-4.4
Household has toilet	Pre		0.16	0.31	-38	0.16	0.31	-38
	Post		0.16	0.13	6.0	0.16	0.15	3.2
House has natural walls	Pre		0.89	0.85	12.1	0.89	0.85	12.1
	Post		0.89	0.92	-7.9	0.89	0.91	-5.5
House has natural roof	Pre		0.77	0.80	-7.5	0.77	0.80	-7.5
	Post		0.77	0.80	-8.1	0.77	0.83	-16.2
Adadle woreda	Pre		0.25	0.23	4.5	0.25	0.23	4.1
	Post		0.25	0.26	-2.9	0.25	0.26	-1.2
Kabridehar woreda	Pre		0.39	0.17	50	0.39	0.17	50.1
	Post		0.38	0.45	-14.2	0.38	0.44	-12.2
Distance (hour) from general Market	Pre		2.46	2.68	-10.1	2.46	2.68	-9.9
	Post		2.44	2.34	4.6	2.44	2.41	1.6
Distance (hour) from livestock Market	Pre		1.24	1.87	-38.1	1.24	1.86	-37.9
	Post		1.24	1.89	-39.7	1.24	2.04	-48.7
Distance (hour) from mobile banking agent/shop	Pre		1.88	1.97	-4.5	1.88	1.97	-4.6
	Post		1.89	1.59	14.6	1.89	1.64	12.1

Notes: The table shows - for each variable, pre- and post-matching, and under both PSM estimators - the mean values for ST and PC group (Columns 1 and 2), as well as the mean absolute standardized bias (Columns 3). All variables' means appear balanced post-matching between treatment and control group and the bias reduces considerably, although for a few variables not below 5 percent.

## **A1-f: Fieldwork activities and data collection**

### Implementation of the baseline evaluation

The baseline field work took place from 5 January to 9 February 2018. The follow-up fieldwork started on 3 February and was concluded on 9 March. The first week of field activities, in both waves, served as a preparatory phase, during which the evaluation team paid courtesy visits and undertook discussions with ETHCO and WFP sub-offices in Gode and Kebridahar. In baseline and follow-up survey, necessary permissions for the start of the activities was granted by local *woreda* officials. Moreover, during baseline, the team obtained household data from WFP to refine the survey design. Before the start of the enumerator training, training materials were prepared, and the instruments were pre-tested in a *kebele* close to Gode town outside of the sample.

The evaluation team then proceeded with the training of three teams, each consisting of six enumerators and one supervisor (21 data collectors in total). The training included ethical and sampling protocols, explanation of survey tools and role play practice. The enumerator teams were able to practice survey tools and protocols in the field in another *kebele* also excluded from the sample.

In the follow-up fieldwork phase, parallel to the quantitative training and pilot-test, a 5-day training for two qualitative enumerators took place with included sessions on the different survey instruments and on transcription as well as role plays and adjustments of translations. The qualitative team also participated in the pilot test to assess the feasibility of the FGD.

After final adjustments of data collection tools and field schedules, the data collection was launched on 16 January 2018 for the baseline and on 17 February 2019 for the quantitative follow-up (19 February 2019 for the qualitative data collection). Both waves of data collection were concluded successfully after a period of approximately three weeks.

### Quality assurance of the survey

The evaluation team adopted a number of measures for quality assurance. The enumerators were recruited from local staff that had previous experience in collecting data for WFP. Each team of enumerators was assigned one field supervisor, who had more local expertise in data collection. The data collection protocols and questionnaires were tested twice before the actual data collection activities: first in a pre-test to refine the randomisation strategy and subsequently in a formal pilot after the enumerator training. The survey questionnaires were translated into the main local language (Somali) and incorporated a number of quality checks. During the endline, the survey tools were partially translated back into English, at which time the evaluation team carefully compared the original and back-translated version to flag inconsistencies and improve the translation.

Further, the CAPI software itself contained many quality checks on logical inconsistencies, out of range responses, and relied heavily on pre-filled data from the baseline to reduce error.

Once the data collections were launched, the quality assurance system was implemented: a workflow in which data was sent to the evaluations team's online server on a daily basis, downloaded, and subject to a series of standard quality checks in Stata for continuous, real-time quality monitoring by the evaluation team. On a

daily basis, a log of all errors and inconsistencies was produced and communicated to supervisors in the field.

During the follow-up data collection, a second quality assurance system was implemented through a backcheck survey. This backcheck was conducted by a trained enumerator from outside the survey team. The backcheck enumerator made follow-up calls to randomly selected households to re-ask a small subset of key questions. The comparison of the backcheck survey to the main survey allowed the evaluation team to identify weak enumerators and induce good performance.

For the qualitative data collection, a C4ED research manager was present throughout the data collection and personally supervised the during the interviews.

### Ethical considerations

With the support of WFP, the local evaluation team obtained the required clearances from relevant government departments in Ethiopia for the baseline survey. The team has also processed ethical clearance from the Ethics Commission/Institutional Review Board of the University of Mannheim (as permitted by WFP). All survey questionnaires were administered with informed consent, and all participants were informed about their right to withdraw from the interviews at any time. Each interview occurred in a private, safe and relaxed atmosphere. The enumerators were adequately trained on how to handle sensitive questions and to respect the protocol.

The confidential handling and safe storage of data as well as the anonymity of respondents was ensured throughout all stages of data collection. Encryption was practiced at all levels including device-level encryption of tablets and laptops used for data collection and field storage. The data was promptly uploaded to a secured server only accessible by authorized C4ED staff. For the data analysis and cleaning, all data was stored in encrypted folders within C4ED. The report and all outputs generated based on the data were carefully reviewed to ensure that they did not inadvertently disclose personal and confidential information. The data will be securely erased after a period of time as defined per IRB.

Furthermore, the evaluation team conducted informal discussions with WFP staff and local chiefs to address potential cultural challenges and issues related to Gender Equality and Empowerment of Women during the interviews. The discussion mainly focused on concerns about whether culturally it is acceptable for male enumerators to interview women. It was suggested that this would not be a problem. The majority of pastoralists and household heads - and therefore respondents to the questionnaires – are male. However, women also participated, in as respondents of the questionnaire module on food insecurity. Their participation was well received by the households, and no cases of refusal from women, their partners or any other male household members were reported.

Moreover, the questionnaire included a section for Mid-Upper Arm Circumference (MUAC) measurements of children under five. No cultural challenge arose in this respect as neither mothers nor children rejected or complained.

### Challenges in the data collection

During the baseline data collection, two main challenges were faced: The first challenge was the late and partial availability of the necessary household information requested by the evaluation team. The uncertainty about the data was addressed by the evaluation team through the design of multiple alternative sampling approaches,

which led to some delay in launching the baseline. Secondly, during the field activities there were security concerns over outbreaks of violence in the Somali region of Ethiopia. Specifically, three *kebeles* (Barmil, Below, Dhaley) in West Imey were alerted of a high risk of violent outbreaks due to ethnic tensions between the Oromia and Somali communities. Throughout the baseline phase, the evaluation team communicated with WFP staff and local administrations about the security situation. The *kebeles* were eventually visited by the enumerators when the alerts ended. No risks were encountered during the data collection in those sites.

During the follow-up, the main challenge faced by the field staff was the mobility of pastoralists. In line with the seasonal cycle, pastoralists migrated with their herds which complicated their tracking and led to attrition.

Another challenge in the follow-up was the discovery that some of the baseline respondents had not been the originally intended respondents. While this is well within the accepted protocol (e.g. that if the respondent is not available, they may survey another household member above the age of 18 and knowledgeable about livestock), it created a challenge in a few cases of household splitting. To resolve this issue, follow-up data collection was suspended for one day and the survey tool was updated to include a verification whether the original baseline target respondent was a member of the tracked household. If they were not, enumerators were instructed to seek out the current household of the original baseline target respondent instead.

## A1-g: Sampling

### Sampling for the quantitative household survey

Sampling was performed at the sub-*kebele*-level. The main reason for using the full group of *kebeles* and conducting the sampling at sub-*kebele*-level was to be able to detect effects both in the presence or absence of a payout. In particular, important outcomes - such as livestock survival and household food insecurity - are highly affected by the delivery of payouts and present a high correlation (Intra-Cluster Correlation, ICC) between individuals living within the same sub-*kebeles* (clusters). In this case, the effects of SIIPE can be precisely estimated by maximising the geographical spread (number of clusters) rather than the number of observed individuals within communities.

The sample size was informed by power calculations in order to make sure that the potential programme impacts would be captured with statistical significance. For each sample group - SIIPE Treatment, SIIPE Control and Pure Control – it was planned to randomly select not less than five households within five random sub-*kebeles* in each *kebele*. The original size considered for each sample group was of 375-425 households (25 households x 15-17 *kebeles* per group), reaching a total sample size of 1,225 households.

The sampling strategy was reviewed once in the field, when receiving actual household and sub-*kebele* information from WFP<sup>1</sup>. The final sample design included all the existing sub-*kebeles*, where an equal number of households was randomly drawn to reach a total sample size of at least 425 households per sample group. Field limitations, mainly due to the unequal distribution of households within *kebeles* and the impossibility to find some targeted households from the SIIPE Control Group (the least numerous group) further affected the sample structure.

**Table V: Baseline sample**

<b>Sample group</b>	<b>Total number of <i>kebeles</i></b>	<b>Total number of sub-<i>kebeles</i></b>	<b>Total number of households</b>
SIIPE Treatment	17	51	465
SIIPE Control	17	44	373
Pure Control	15	68	476
			<b>1,314</b>

The sampling of households relied on lists of selected treatment and control households per SIIPE *kebele* shared by WFP and lists of PSNP beneficiaries registered in each sub-*kebele*. The latter were partially retrieved in soft copy before field work via WFP and partially in hard copy directly at the moment of sampling in the field. Random sampling was adopted. Section 1.3.3 of the main text shows the actual structure of the endline sample after data cleaning.

---

<sup>1</sup> The sample design was slightly adjusted, though, since the actual number of sub-*kebele* per *kebele* was not sufficiently large.



### Sampling for qualitative data collection

Table VI provides an overview on the qualitative endline sample including information on the different types of interviews, the respective respondents and the location where the interviews took place.

The sampling of FGD participants was based on the quantitative household survey. The FGD selection criteria were i) completed participation in the quantitative household survey and ii) being part of the SIIPE treatment group. In the initial sampling approach, it was decided to include SIIPE treatment households only to gather detailed information on awareness and understanding as well as financial inclusion through SIIPE. To get closer insights into the gender dimension and to design the methodology as gender responsive as possible, it was decided to conduct gender segregated FGDs.

The selection of kebeles was stratified on i) the level of food security as measured during the baseline and ii) the occurrence of tensions and disruptions in 2018 causing differences in the local context and thereby affecting the interpretation of a number of outcomes related to the intervention. The local WFP sub-office informed the choice of *kebeles* that had faced tensions and disruptions. The *kebeles* chosen were Todob, Dalaad, Gabal and Barasiibo. Within a given *kebele*, all FGDs were conducted in the main sub-*kebele*. The only exception is the FGD with female participants in Gabal which was conducted in a smaller sub-*kebele* due to insufficient availability of participants in the main sub-*kebele*.

After six out of the eight targeted FGDs had been carried out in the *kebeles* of Todob, Dalaad and Gabal, data saturation was reached. To gather non-redundant information, the sampling strategy for the two additional targeted FGDs was re-defined following the idea of collecting insights into potential spill-overs. Hence, two mixed gender FGDs from which one invited SIIPE treatment and the other one SIIPE control participants from the same *kebele*, Siigole. This *kebele* was chosen based on the progress of the quantitative survey.

The IDIs and KIIs were purposively sampled. As for the IDIs with the community leaders, one IDI was conducted with the community of the sub-*kebele* chosen for the FGDs. Through this exercise more detailed insights from community opinion leaders are expected to be captured, which then can be interlinked with the FGD data collected in the respective sub-*kebeles*.

Three different sets of KII were conducted with BelCash/HelloCash, SIIPE and insurance representatives, to gather more detailed insights into different aspects of the implementation and execution of the programme. Firstly, KIIs with respondents of BelCash/HelloCash were conducted to understand more about the financial inclusion dimension of SIIPE. Hereby, HelloCash agents based in the different *kebeles* sampled for FGDs were interviewed as well as one HelloCash representative from a main branch in Gode and one BelCash representative from the headquarters in Addis Ababa.

Secondly, for KIIs conducted with SIIPE representatives, two focal persons from WFP and one focal person from the BoLPD were interviewed and gave insights on the implementation in all three *woredas*. Thirdly, one KII with a representative of the Oromia Insurance Company, one of the four companies in the pool for SIIPE, was interviewed to better understand the general structure of an index-based livestock insurance and its sustainability.

**Table VI: Qualitative endline sample**

Type of Interview	Total Number	Respondent(s)	Kebele (Woreda)
FGD	8	2 Male SIIPE beneficiaries	Todob (Adadle)
		7 Female SIIPE beneficiaries	
		4 Male SIIPE beneficiaries	Gabal (Adadle)
		7 Female SIIPE beneficiaries	
		3 Male SIIPE beneficiaries	Dalad (Kebridahar)
		7 Female SIIPE beneficiaries	
		6 Mixed gender SIIPE beneficiaries	Siigole (Adadle)
		8 Mixed gender SIIPE control group	
IDI	5	Head of <i>kebele</i>	Todob (Adadle)
			Dalad (Kebridahar)
			Siigole (Adadle)
			Gabal (Adadle)
		Head of sub- <i>kebele</i>	
BelCash/HelloCash KII	5	HelloCash Agent	Todob (Adadle)
			Gabal (Adadle)
			Dalad (Kebridahar)
			Gode
		BelCash representative	Addis Ababa
SIIPE KII	3	WFP SIIPE Focal Person Adadle/West Imey	Gode
		WFP SIIPE Focal Person Kebridahar	
		BoLPD SIIPE Focal Person Adadle/West Imey	
Insurance Company KII	1	Oromia Insurance Company representative	Addis Ababa

### **A1-h: Sample attrition**

Table VII shows the rates of attrition, both overall and disaggregated by sample group. The ST and SC groups exhibit almost similar attrition rates (10.56 and 10.99 percent, respectively) which are significantly higher than the non-random PC (pure control) group (2.52 percent). However, a random shock - a measles outbreak in the SIIPE *kebele* of Darasalam - accounts for a quarter of total attrition. When excluding the measles cases, the difference in attrition rates between SIIPE and non-SIIPE *kebeles* reduces from 8 to 5 percentage points.

The different reasons for attrition were recorded during the data collection and are displayed in Table VIII. The most common reason for attrition in all treatment groups is migration. Migration occurred in the SIIPE pilot *kebeles* (ST:4.96 percent; SC:3.75 percent) more than the PC *kebeles* (2.10 percent). The survey team made every effort to minimise this type of attrition by tracking households that migrated outside their original baseline *kebele* but remained within the sample area to conduct the interview.

To verify whether the differential attrition rates are related to non-random attrition (which could potentially create estimation bias), the following tables compares the characteristics of the baseline sample and of the actual follow-up sample (overall and by treatment group). In general, there seems to be only slight changes in the means of follow-up versus baseline characteristics for the overall sample and for each treatment group. Hence, it can be concluded that the differential attrition across treatment groups did not threaten the similarity of the groups.

**Table VII: Attrition rates by treatment group**

Treatment Group	No. Observations Baseline	No. Observations Follow-up	Attrition rate in percent excl. measles cases	Attrition rate in percent incl. measles cases
SIPE Treatment	464	415	0.0839	0.1056
SIPE Control	373	332	0.0752	0.1099
Pure Control	477	465	0.0252	0.0252
Total	1314	1212	0,0597	0.0776

Source: C4ED analysis of baseline and endline data.

**Table VIII: Reason for attrition by treatment group**

	All		SIPE Treatment		SIPE Control		Pure Control	
	No. obs. attrited	Attrition rate in %	No. obs. attrited	Attrition rate in %	No. obs. attrited	Attrition rate in %	No. obs. attrited	Attrition rate in %
Migration	47	3.58	23	4.96	14	3.75	10	2.1
Non-traceability	14	1.07	7	1.51	6	1.61	1	0.21
Non-availability	14	1.07	7	1.51	6	1.61	1	0.21
Refusal	2	0.15	1	0.22	1	0.27	0	0
Measles	25	1.09	11	0.24	14	3.75	0	0
Total attrition incl. measles	102	7.76	49	10.56	41	10.99	12	2.52

Source: C4ED analysis of baseline and endline data.

**Table VIII: Comparison of socio-economic characteristics baseline vs. non-attriters**

	All		ST		SC		PC	
	Mean Baseline	Non- Attriters	Mean Baseline	Non- Attriters	Mean Baseline	Non- Attriters	Mean Baseline	Non- Attriters
<b>Household Head Characteristics</b>								
Age Household Head	41.84	41.54	41.93	41.24	41.62	41.71	41.93	41.69
Female-Headed Household	0.35	0.35	0.38	0.39	0.39	0.40	0.29	0.29
Household head with education	0.46	0.47	0.41	0.42	0.51	0.52	0.47	0.48
<b>Household Composition</b>								
Number of Household Members	7.53	7.54	7.91	7.92	7.23	7.24	7.40	7.42
Number of Children	2.90	2.89	3.13	3.09	2.69	2.71	2.85	2.84
<b>Main Economic Activity</b>								
Pastoralist	0.56	0.55	0.67	0.65	0.61	0.60	0.42	0.42
Agropastoralist	0.33	0.34	0.25	0.26	0.29	0.30	0.45	0.44
TLU	7.90	7.94	8.10	8.17	7.90	8.00	7.70	7.68
<b>Household Settlement</b>								
Permanent settled	0.82	0.83	0.75	0.76	0.86	0.88	0.86	0.87
Partially settled	0.12	0.12	0.15	0.15	0.10	0.09	0.12	0.11
<b>Other Household Characteristics</b>								
PSNP Direct Support	0.12	0.11	0.11	0.09	0.11	0.11	0.13	0.13
Household owns phone	0.74	0.75	0.74	0.76	0.77	0.79	0.71	0.72
Household owns mattress	0.38	0.39	0.30	0.31	0.40	0.42	0.43	0.44
Household has toilet access	0.22	0.23	0.14	0.15	0.21	0.23	0.31	0.31
House has natural roof	0.78	0.78	0.77	0.76	0.77	0.77	0.80	0.80
House has natural floor	0.95	0.95	0.96	0.96	0.95	0.95	0.95	0.95
House has natural walls	0.86	0.86	0.89	0.89	0.83	0.84	0.85	0.85
Observations	1,313	1212	464	415	373	332	477	465

Source: C4ED analysis of baseline and endline data.

## **ANNEX 2: SUMMARY STATISTICS**

All data presented below, unless otherwise indicated, is derived from endline data collected in February/March 2019.

**Table IX: Endline values for EQ 1: Behavioural change**

Variables	SIPE Treatment			Pure Control		
	No. of observations	Mean	Std. dev.	No. of observations	Mean	Std. dev.
<b>A: Sub-EQ 1.1: Livestock-related investments (yes/no)</b>						
Has purchased livestock	384	0.10	0.30	465	0.07	0.25
Has purchased camel	384	0.02	0.13	465	0.01	0.08
Has purchased cow	384	0.04	0.20	465	0.02	0.15
Has purchased shoat	384	0.05	0.22	465	0.04	0.20
Has purchased forage/fodder	384	0.53	0.50	465	0.45	0.50
Has purchased veterinary medicine/services	384	0.67	0.47	465	0.48	0.50
Has purchased water or other	384	0.26	0.44	465	0.20	0.40
<b>B: Sub-EQ 1.1: Absolute livestock-related expenditure (ETB)</b>						
Expenditure on livestock	384	1182.03	6696.93	465	496.84	3424.71
Expenditure on camels	384	591.93	5774.65	465	66.67	903.70
Expenditure on forage/fodder	384	951.51	1958.02	465	1070.87	2351.81
Expenditure on veterinary medicine/services	384	310.07	628.90	465	199.91	493.52
Expenditure on water or other	384	341.81	1173.62	465	220.44	804.23
<b>C: Sub-EQ 1.1: Livestock-related expenditures as share of total expenditure</b>						
Total livestock expenditure	382	0.51	7.77	464	0.08	0.21
Livestock expenditure	384	0.41	7.02	465	0.03	0.29
Fodder/forage expenditure	384	0.07	0.64	465	0.05	0.15
Veterinary medicine/services expenditure	384	0.01	0.09	465	0.01	0.03
Water or other expenditure	384	0.02	0.07	465	0.01	0.07
<b>D: Sub-EQ 1.2: Household asset ownership</b>						
Number of total assets owned	384	3.93	2.24	465	4.56	2.90
Share weighted average index <sup>2</sup>	384	1.34	0.79	465	1.43	0.87
Total value of owned assets	384	1194.17	2954.30	465	1750.44	5071.36
Per capita value of durable goods <sup>3</sup>	384	181.08	429.29	465	228.91	702.71

<sup>2</sup> The share weighted average index presents the sum of assets owned across asset categories weighted by the share of the respondents who indicated not to own assets out of the respective asset category.

<sup>3</sup> The per capita value of assets gives the self-reported value of the assets owned divided by the number of household members.

Variables	SIPE Treatment			Pure Control		
	No. of observations	Mean	Std. dev.	No. of observations	Mean	Std. dev.
<b>E: Sub-EQ 1.3: Coping mechanisms and distress sales</b>						
No. of shocks (out of 21)	384	3.92	2.54	465	3.96	2.84
Has experienced drought (yes/no)	384	0.99	0.09	465	0.98	0.12
Number of coping strategies (out of 18)	384	5.56	4.19	465	5.65	4.54
Has carried out livestock distress sales (yes/no)	384	0.33	0.47	465	0.35	0.48
Has invested in livestock (fodder, water, vet) (yes/no)	384	0.65	0.90	465	0.58	0.93
Has vaccinated/ animals or used veterinary services (yes/no)	384	0.28	0.45	465	0.24	0.43
Has reduced number of meals (yes/no)	384	0.92	0.28	465	0.92	0.27
Has relied on remittances (yes/no)	384	0.08	0.27	465	0.13	0.34
Migration of household member(s) (yes/no)	384	0.14	0.34	465	0.12	0.32

<b>F: Sub-EQ 1.4: Income diversification</b>						
Number of income sources	384	1.63	0.86	465	1.83	1.30
Has received income from livestock sales (yes/no)	384	2998.99	2903.47	465	2955.05	3389.13
Has received income from PSNP (yes/no)	384	0.76	0.43	465	0.65	0.48
Has received income from farming (yes/no)	384	0.46	0.50	465	0.39	0.49
Has received income from labour work (yes/no)	384	0.03	0.17	465	0.12	0.33
Has received income from business (yes/no)	384	0.07	0.25	465	0.22	0.42
Income from livestock sales (ETB)	384	0.05	0.22	465	0.07	0.25
Income share from livestock sales	384	2027.78	2735.53	465	1614.04	2486.30
Income share from PSNP transfer	372	0.64	0.39	428	0.53	0.40
Income diversification index	372	0.23	0.34	428	0.22	0.34
Berry index	372	1.36	0.47	427	1.55	0.68

<b>G: Sub-EQ 1.5: Stability of income sources</b>						
Number. of months w/o income	384	2.26	1.57	465	2.18	1.53



Variables	SIPE Treatment			Pure Control		
	No. of observations	Mean	Std. dev.	No. of observations	Mean	Std. dev.
Share of income from stable income sources	372	0.26	0.36	428	0.27	0.37
<b>H: Sub-EQ 1.6: Protection of vulnerable household members (yes/no)</b>						
HH has children absent from school	384	0.38	0.49	465	0.38	0.48
HH has some children engaged in economic activities	384	0.11	0.31	465	0.10	0.30
HH includes married children	384	0.07	0.25	465	0.11	0.31
HH has boys absent from school	384	0.24	0.43	465	0.28	0.45
Absent from school due to not being able to afford	93	0.14	0.35	131	0.24	0.43
Absent from school due to domestic duties	93	0.55	0.50	131	0.49	0.50
Absent from school due to other reasons	93	0.31	0.47	131	0.27	0.45
HH has girls absent from school	384	0.22	0.42	465	0.25	0.44
Absent from school due to not being able to afford	86	0.24	0.43	118	0.28	0.45
Absent from school due to domestic duties	86	0.44	0.50	118	0.45	0.50
Absent from school due to other reasons	86	0.31	0.47	118	0.27	0.45

Source: C4ED analysis of endline data.

**Table X: Endline values for EQ 2: Insurance awareness & understanding, financial literacy**

Variables	SIPE Treatment			Pure Control		
	No. of observations	Mean	Std. dev.	No. of observations	Mean	Std. dev.
<b>A: Sub-EQ 2.1: Awareness and understanding of insurance and SIPE</b>						
Has heard of insurance (yes/no)	384	0.78	0.41	465	0.44	0.50
Knows of livestock insurance (yes/no)	301	0.57	0.50	203	0.26	0.44
Has purchased insurance (yes/no)	301	0.17	0.38	203	0.09	0.28
At least somewhat understand insurance (yes/no)	301	0.47	0.50	203	0.18	0.39
Knowledge of insurance: number of correct responses to 7 test questions [0,7]	118	3.02	1.20	35	3.11	1.41
Has heard of SIPE (yes/no)	301	0.65	0.48	203	0.31	0.46
Knowledge of SIPE: number of correct responses to test 10 questions [0,10]	176	3.11	2.09	56	2.13	1.89
<b>B: Sub-EQ 2.1: Knowledge of SIPE (correct=1, incorrect=0)</b>						
TLU coverage	384	0.26	0.44	465	0.03	0.16
Responsible actor for premium	384	0.15	0.36	465	0.03	0.17
Amount of premium	384	0.10	0.30	465	0.02	0.12
Number of PW days for PW households	384	0.27	0.44	465	0.08	0.27
Number of PW days for DS households	384	0.18	0.38	465	0.06	0.25
Reason for payout trigger	384	0.15	0.36	465	0.01	0.11
Number of months/years covered by premium	384	0.00	0.05	465	0.00	0.00
Number of seasons covered by premium	384	0.19	0.39	465	0.02	0.15
Number of possible payouts	384	0.00	0.00	465	0.00	0.00
Amount of maximum possible payout	384	0.13	0.34	465	0.01	0.08
<b>C: Sub-EQ 2.1: Perception on Insurance (yes/no)</b>						
Insurance enrolment process is easy	156	0.10	0.30	79	0.15	0.36
Insurance premium is appropriate	133	0.31	0.46	56	0.41	0.50

Variables	SIPE Treatment			Pure Control		
	No. of observations	Mean	Std. dev.	No. of observations	Mean	Std. dev.
Insurance is valuable in terms of time and money	119	0.83	0.38	52	0.73	0.45
Insurance compensation is appropriate	130	0.23	0.42	67	0.19	0.40
Insurance contract favours insured (not insurer)	108	0.56	0.50	46	0.17	0.38
Paperwork to be compensated is appropriate	119	0.16	0.37	51	0.16	0.37
The length of the payout process is appropriate	141	0.04	0.19	78	0.05	0.22
<b>D: Sub-EQ 2.2: Willingness to pay (WTP) for livestock insurance</b>						
Willingness to pay (yes/no)	384	0.47	0.50	465	0.27	0.45
WTP for one camel (in ETB)	115	456.24	855.11	31	287.26	638.28
WTP for one cow (in ETB)	144	273.51	336.83	121	375.27	498.74
WTP for one shoat (in ETB)	174	117.57	130.44	118	126.67	216.36
WTP for one TLU (in ETB)	180	521.17	594.77	127	528.19	812.43
<b>E: Sub-EQ 2.3: Financial coping mechanisms (yes/no)</b>						
Coping through credit uptake (livestock, food, other)	384	0.88	0.82	465	0.74	0.75
Obtained credit for livestock	384	0.14	0.35	465	0.08	0.27
Obtained credit for food	384	0.59	0.49	465	0.54	0.50
Obtained credit for other expenses	384	0.14	0.35	465	0.12	0.33
Coping through own savings	384	0.23	0.42	465	0.12	0.32
<b>F: Sub-EQ 2.4: Access to and use of financial services (yes/no)</b>						
Access mobile banking account	384	0.32	0.47	465	0.05	0.22
Use mobile banking account	384	0.08	0.27	465	0.03	0.18
Use mobile banking account (with account)	122	0.25	0.44	23	0.70	0.47
ROSCA/ Merry-go-round	384	0.01	0.11	465	0.02	0.15
Formal bank account	384	0.04	0.19	465	0.01	0.11

Source: C4ED analysis of endline data.

**Table XI: Endline values for Sub-EQ 3.1: Planned payout use**

Variables	SIPE Treatment			Pure Control		
	No. of observations	Mean	Std. dev.	No. of observations	Mean	Std. dev.
<b>A: Sub-EQ 3.1: Planned use of payouts (yes/no)</b>						
Food	183	0.91	0.29	183	0.91	0.29
Other household needs	183	0.56	0.50	183	0.56	0.50
Livestock activities	183	0.77	0.43	183	0.77	0.43
Non-livestock economic activities and other	183	0.42	0.49	183	0.42	0.49
<b>B: Sub-EQ 3.1: Planned share of payout</b>						
Food	183	0.44	0.25	183	0.44	0.25
Other household needs	183	0.16	0.17	183	0.16	0.17
Livestock activities	183	0.28	0.24	183	0.28	0.24
Non-livestock economic activities and other	183	0.12	0.19	183	0.12	0.19

Source: C4ED analysis of endline data.

**Table XII: Endline values for Sub-EQ 3.3: Livestock accounting: stocks; losses**

Variables	SIPE Treatment			Pure Control		
	No. of observations	Mean	Std. dev.	No. of observations	Mean	Std. dev.
<b>A: Sub-EQ 3.3: Livestock accounting: stocks</b>						
Number of Camels owned in January 2018	384	3.05	4.40	465	0.79	2.40
Number of Cows owned in January 2018	384	3.87	3.38	465	4.26	2.55
Number of Shoats owned in January 2018	384	20.61	15.97	465	12.27	10.75
Number of livestock owned in January 2018	384	27.53	18.37	465	17.32	11.53
Livestock in January 2018 (TLU)	384	10.19	7.57	465	6.59	4.01
Number of Camels owned in February 2019	384	2.79	4.13	465	0.62	1.86
Number of Cows owned in February 2019	384	3.40	3.47	465	3.01	2.78
Number of Shoats owned in February 2019	384	19.73	15.61	465	9.89	11.10
Number of livestock owned in February 2019	384	25.93	18.29	465	13.52	12.45
Livestock in February 2019 (TLU)	384	9.29	7.37	465	4.87	4.03
<b>B: Sub-EQ 3.3: Livestock accounting: losses</b>						
Number of Camels lost in 2018-19	384	0.76	2.31	465	0.26	1.34
Number of Cows lost in 2018-19	384	1.06	1.72	465	1.32	1.66
Number of Shoats lost in 2018-19	384	4.42	7.51	465	3.52	5.25
No. of livestock lost in 2018-19	384	6.24	9.42	465	5.10	6.04
Share of livestock lost in 2018-19	383	0.22	0.24	461	0.30	0.28
Value of livestock lost (mean purchasing price, ETB)	384	15423.1	27264.7	465	11221.1	15122.1
Value of livestock lost (mean selling price, ETB)	384	20276.9	33249.3	465	15276.3	18671.1
Livestock lost (TLU) in 2018-19	384	2.57	4.48	465	2.04	2.64
Share of livestock lost (TLU) in 2018-19	383	0.23	0.25	461	0.30	0.28
Value of livestock lost (TLU) (mean purchasing price, ETB)	384	14667.0	34239.5	465	8944.9	19455.8
Value of livestock lost (TLU) (mean selling price, ETB)	384	16769.6	38868.5	465	10342.1	22103.6

Variables	SIPE Treatment			Pure Control		
	No. of observations	Mean	Std. dev.	No. of observations	Mean	Std. dev.
<b>C: Sub-EQ 3.3: Livestock accounting: reasons for losses (yes/no)</b>						
Livestock lost due to drought	279	0.77	0.42	351	0.74	0.44
Livestock lost due to accident or disease	279	0.31	0.46	351	0.29	0.46
Livestock lost due to predation	279	0.04	0.20	351	0.04	0.20
Livestock lost due to rain	279	0.00	0.00	351	0.01	0.11
Livestock lost due to raid	279	0.00	0.00	351	0.00	0.05
Livestock lost due to birth	279	0.00	0.06	351	0.00	0.05
Livestock lost due to just lost	279	0.05	0.21	351	0.02	0.15
Livestock lost (other reasons)	279	0.01	0.12	351	0.01	0.11
<b>D: Sub-EQ 3.3: Livestock accounting: timing of losses(yes/no)</b>						
Livestock lost in January 2018 (early Jilal)	384	0.13	0.34	465	0.20	0.40
Livestock lost in February 2018 (middle Jilal)	384	0.30	0.46	465	0.35	0.48
Livestock lost in March 2018 (late Jilal)	384	0.37	0.48	465	0.45	0.50
Livestock lost in April 2018 (early Guu)	384	0.09	0.29	465	0.09	0.28
Livestock lost in May 2018 (middle Guu)	384	0.08	0.27	465	0.06	0.25
Livestock lost in June 2018 (late Guu)	384	0.07	0.25	465	0.05	0.21
Livestock lost in July 2018 (early Haga)	384	0.08	0.28	465	0.06	0.24
Livestock lost in August 2018 (middle Haga)	384	0.14	0.35	465	0.11	0.31
Livestock lost in September 2018 (late Haga)	384	0.12	0.33	465	0.11	0.32
Livestock lost in October 2018 (early Deyr)	384	0.10	0.30	465	0.08	0.27
Livestock lost in November 2018 (middle Deyr)	384	0.10	0.31	465	0.08	0.27
Livestock lost in December 2018 (late Deyr)	384	0.13	0.33	465	0.09	0.29
Livestock lost in January 2019 (early Jilal)	384	0.14	0.35	465	0.15	0.35

Source: C4ED analysis of endline data.

**Table XIII: Endline values for Sub-EQ 3.3: Livestock accounting: offtakes**

Variables	SIPE Treatment			Pure Control		
	No. of observations	Mean	Std. dev.	No. of observations	Mean	Std. dev.
<b>A: Sub-EQ 3.3: Livestock accounting: offtakes</b>						
No. of Camels taken off in 2018-19	384	0.03	0.38	465	0.02	0.27
No. of Cows taken off in 2018-19	384	0.04	0.26	465	0.06	0.41
No. of Shoats taken off in 2018-19	384	0.31	1.12	465	0.26	1.35
Number of livestock taken off in 2018-19	384	0.38	1.21	465	0.34	1.45
Number of livestock taken off (only positive values)	54	2.70	2.06	53	2.94	3.30
Share of livestock taken off in 2018-19	383	0.01	0.04	461	0.01	0.06
Value of livestock taken off (mean purchasing price, ETB)	384	757.48	3613.61	465	692.84	3190.97
Value of livestock taken off (mean selling price, ETB)	384	1062.99	4195.13	465	961.50	4055.26
Livestock taken off (TLU) in 2018-19	384	0.11	0.60	465	0.11	0.57
Share of livestock taken off (TLU) in 2018-19	383	0.01	0.04	461	0.01	0.07
Value of livestock taken off (TLU) (mean purchasing price, ETB)	384	608.95	5231.39	465	549.09	3986.35
Value of livestock taken off (TLU) (mean selling price, ETB)	384	694.94	5924.73	465	630.58	4538.01
<b>B: Sub-EQ 3.3: Livestock accounting: Reasons for offtakes (yes/no)</b>						
Has taken off some livestock for gifting	54	0.44	0.50	53	0.36	0.48
Has taken off some livestock for slaughtering	54	0.37	0.49	53	0.51	0.50
Has taken off some livestock for loaning out	54	0.06	0.23	53	0.00	0.00
Has taken off some livestock due to debt	54	0.19	0.39	53	0.15	0.36
Has taken off some livestock for exchange	54	0.00	0.00	53	0.02	0.14
Has taken off some livestock for other reasons	54	0.00	0.00	53	0.02	0.14

Variables	SIPE Treatment			Pure Control		
	No. of observations	Mean	Std. dev.	No. of observations	Mean	Std. dev.
<b>C: Sub-EQ 3.3: Livestock accounting: timing for offtakes (yes/no)</b>						
Livestock taken off in January 2018 (early Jilal)	384	0.02	0.13	465	0.01	0.09
Livestock taken off in February 2018 (middle Jilal)	384	0.01	0.10	465	0.02	0.15
Livestock taken off in March 2018 (late Jilal)	384	0.01	0.11	465	0.02	0.12
Livestock taken off in April 2018 (early Guu)	384	0.02	0.15	465	0.01	0.09
Livestock taken off in May 2018 (middle Guu)	384	0.01	0.07	465	0.00	0.07
Livestock taken off in June 2018 (late Guu)	384	0.02	0.15	465	0.01	0.09
Livestock taken off in July 2018 (early Haga)	384	0.01	0.11	465	0.01	0.11
Livestock taken off in August 2018 (middle Haga)	384	0.02	0.13	465	0.02	0.13
Livestock taken off in September 2018 (late Haga)	384	0.02	0.12	465	0.02	0.13
Livestock taken off in October 2018 (early Deyr)	384	0.01	0.10	465	0.02	0.12
Livestock taken off in November 2018 (middle Deyr)	384	0.03	0.16	465	0.01	0.08
Livestock taken off in December 2018 (late Deyr)	384	0.02	0.13	465	0.03	0.17
Livestock taken off in January 2019 (early Jilal)	384	0.03	0.16	465	0.01	0.11

Source: C4ED analysis of endline data.



**Table XIV: Endline values for Sub-EQ 3.4: Livestock accounting: sales**

Variables	SIPE Treatment			Pure Control		
	No. of observations	Mean	Std. dev.	No. of observations	Mean	Std. dev.
<b>A: Sub-EQ 3.4: Livestock accounting: sales</b>						
Number of Camels sold in 2018-2019	384	0.17	0.51	465	0.04	0.26
Number of Cows sold in 2018-2019	384	0.33	0.76	465	0.56	0.92
Number of Shoats sold in 2018-2019	384	2.56	4.10	465	2.21	3.57
Number of livestock sold in 2018-2019	384	3.07	4.26	465	2.81	3.90
Share of livestock sold in 2018-2019	383	0.12	0.17	461	0.17	0.22
Value of livestock sold (mean selling price, ETB)	384	7955.45	9901.01	465	7189.13	9097.02
Livestock sold (TLU) in 2018-2019	384	0.83	1.15	465	0.84	1.11
Share of livestock sold (TLU) in 2018-2019	383	0.09	0.12	461	0.14	0.20
Value of livestock sold (TLU) (mean selling price, ETB)	384	4234.24	8728.50	465	3313.01	5748.47
<b>B: Sub-EQ 3.4: Reasons for sales (yes/no)</b>						
Livestock sold for food	233	0.89	0.31	292	0.90	0.29
Livestock sold for non-food items	233	0.05	0.21	292	0.05	0.22
Livestock sold for livestock investment	233	0.04	0.20	292	0.04	0.19
Livestock sold due to debt	233	0.09	0.28	292	0.11	0.31
Livestock sold for other reasons	233	0.01	0.11	292	0.02	0.15
<b>C: Sub-EQ 3.4: Livestock accounting: timing for sales (yes/no)</b>						
Livestock sold in January 2018 (early Jilal)	384	0.07	0.26	465	0.07	0.26
Livestock sold in February 2018 (middle Jilal)	384	0.11	0.32	465	0.07	0.25
Livestock sold in March 2018 (late Jilal)	384	0.15	0.35	465	0.11	0.32
Livestock sold in April 2018 (early Guu)	384	0.11	0.31	465	0.11	0.32
Livestock sold in May 2018 (middle Guu)	384	0.12	0.32	465	0.12	0.32

Variables	SIPE Treatment			Pure Control		
	No. of observations	Mean	Std. dev.	No. of observations	Mean	Std. dev.
Livestock sold in June 2018 (late Guu)	384	0.10	0.30	465	0.12	0.32
Livestock sold in July 2018 (early Haga)	384	0.10	0.30	465	0.13	0.34
Livestock sold in August 2018 (middle Haga)	384	0.13	0.33	465	0.10	0.30
Livestock sold in September 2018 (late Haga)	384	0.09	0.28	465	0.13	0.34
Livestock sold in October 2018 (early Deyr)	384	0.14	0.35	465	0.12	0.32
Livestock sold in November 2018 (middle Deyr)	384	0.12	0.32	465	0.11	0.32
Livestock sold in December 2018 (late Deyr)	384	0.13	0.34	465	0.14	0.35
Livestock sold in January 2019 (early Jilal)	384	0.18	0.38	465	0.23	0.42

#### D: Livestock purchases and intakes

Number of Camels purchased in 2018-2019	384	0.05	0.50	465	0.02	0.21
Number of Cows purchased in 2018-2019	384	0.08	0.43	465	0.05	0.40
Number of Shoats purchased in 2018-2019	384	0.19	1.26	465	0.27	1.98
Number of livestock purchased in 2018-2019	384	0.32	1.42	465	0.33	2.03
Livestock purchased (TLU) in 2018-2019	384	0.17	0.85	465	0.10	0.53
Livestock intaken (Number of animals) in 2018-2019	384	7.77	9.76	465	4.12	6.76
Livestock intaken (TLU) in 2018-2019	384	2.43	3.12	465	1.17	1.81

Source: C4ED analysis of endline data.

**Table XV: Endline values of selected outcome indicators for EQ 4**

Variables	SIPE Treatment			Pure Control		
	No. of observations	Mean	Std. dev.	No. of observations	Mean	Std. dev.
<b>A: Sub-EQ 4.1: Household Food Insecurity Access Score (HFIAS)</b>						
Total HFIAS (0-27)	384	12.98	6.56	465	13.69	5.64
Smaller meals than needed (HFIAS Q5) (ever) (yes/no)	384	0.88	0.33	465	0.92	0.28
Fewer than 3 meals per day (HFIAS Q6) (ever) (yes/no)	384	0.86	0.35	465	0.93	0.26
Went to sleep at night hungry (HFIAS Q8) (ever) (yes/no)	384	0.69	0.46	465	0.81	0.40
All day and night hungry (HFIAS Q9) (ever) (yes/no)	384	0.48	0.50	465	0.58	0.49
<b>B: Sub-EQ 4.1: Children's nutritional status</b>						
Mean mid upper arm circumference (MUAC) in cm	236	13.48	1.44	306	13.33	1.27
MUAC result: severely acutely malnourished	236	0.05	0.22	306	0.03	0.16
MUAC result: moderately acutely malnourished	236	0.13	0.33	306	0.19	0.39
MUAC result: at risk of acute malnutrition	236	0.30	0.46	306	0.34	0.48
MUAC result: well nourished	236	0.53	0.50	306	0.44	0.50
<b>Panel C: Sub-EQ 4.2: Dietary diversification</b>						
MDD-W Score (0-10)	351	1.65	0.84	445	1.76	0.84
Only consumed grain (yes/no)	351	0.50	0.50	445	0.43	0.50
Consumed any fruit/vegetable (yes/no)	351	0.26	0.44	445	0.24	0.43
Ate grains, white roots and tubers (yes/no)	351	0.97	0.17	445	0.99	0.09
Ate pulses (yes/no)	351	0.08	0.27	445	0.14	0.35
Ate nuts and seeds (yes/no)	351	0.03	0.16	445	0.02	0.12
Ate dairy (yes/no)	351	0.25	0.43	445	0.31	0.46
Ate meat and fish (yes/no)	351	0.06	0.24	445	0.07	0.25
Ate eggs (yes/no)	351	0.00	0.00	445	0.00	0.00
Ate dark green leafy vegetables (yes/no)	351	0.00	0.00	445	0.00	0.00
Ate other vitamin A-rich fruits and vegetables (yes/no)	351	0.00	0.00	445	0.00	0.00

Variables	SIPE Treatment			Pure Control		
	No. of observations	Mean	Std. dev.	No. of observations	Mean	Std. dev.
Ate other vegetables (yes/no)	351	0.26	0.44	445	0.24	0.43
Ate other fruits (yes/no)	351	0.00	0.00	445	0.00	0.00

**Panel D: Sub-EQ 4.3: Food expenditure**

Total monthly expenditure (ETB)	384	2535.71	2321.89	465	2318.20	2052.00
Share of food in total expenditure	384	0.68	0.17	465	0.69	0.17
Share of food expenditure in total income	372	1.09	3.69	428	0.94	1.79

Source: C4ED analysis of endline data.

**Table XVI: Endline values of outcome indicators by gender of HH head**

Variables	Female-headed households			Male-headed households		
	No. of observations	Mean	Std. dev.	No. of observations	Mean	Std. dev.
<b>A: Sub-EQ 1.1: Livestock-related investments</b>						
Has purchased livestock	157	0.10	0.29	227	0.11	0.31
Total livestock-related expenditures (ETB since Jan 2018)	156	2139.72	3937.53	226	2577.68	5683.19
<b>B: Sub-EQ 1.2: Household asset ownership</b>						
Number of total assets owned	157	3.82	2.10	227	4.01	2.33
<b>C: Sub-EQ 1.3: Coping mechanisms</b>						
Number of coping strategies (out of 18)	157	4.89	3.41	227	6.03	4.61
Has invested in livestock (fodder, water, vet) (yes/no)	157	0.61	0.89	227	0.68	0.91
Has vaccinated/ animals or used veterinary services (yes/no)	157	0.31	0.46	227	0.26	0.44
Migration of household member(s) (yes/no)	157	0.06	0.23	227	0.19	0.39
Diversified income sources	157	0.07	0.26	227	0.17	0.38
<b>D: Sub-EQ 1.4: Income diversification</b>						
Number of income sources	157	1.68	0.89	227	1.59	0.83
Total income (ETB)	157	3040.32	3235.81	227	2970.40	2656.51
Income share from livestock sales	157	0.56	0.41	227	0.66	0.39
Income share from PSNP transfer	157	0.29	0.37	227	0.18	0.31
<b>E: Sub-EQ 1.5: Stability of income sources</b>						
Number of months without income	157	2.06	1.34	227	2.39	1.71
<b>F: Sub-EQ 1.6: Protection of vulnerable household members (yes/no)</b>						
HH has children absent from school	157	0.36	0.48	227	0.39	0.49
HH has some children engaged in economic activities	157	0.07	0.26	227	0.13	0.34
HH includes married children	157	0.10	0.29	227	0.05	0.22
<b>G: Sub-EQ 2.1: Awareness and understanding of insurance and SIPE</b>						
Has heard of insurance (yes/no)	157	0.78	0.42	227	0.79	0.41
Knows of livestock insurance (yes/no)	122	0.52	0.50	179	0.61	0.49

Variables	Female-headed households			Male-headed households		
	No. of observations	Mean	Std. dev.	No. of observations	Mean	Std. dev.
At least somewhat understand insurance (yes/no)	122	0.48	0.50	179	0.46	0.50
Knowledge of insurance: number of correct responses to 7 test questions [0,7]	48	2.85	1.01	70	3.13	1.31
Has heard of SIIPE (yes/no)	122	0.65	0.48	179	0.66	0.48
Knowledge of SIIPE: number of correct responses to test 10 questions [0,10]	68	3.00	2.11	108	3.19	2.08
<b>H: Sub-EQ 2.2: Willingness to pay for insurance</b>						
Willingness to pay (yes/no)	157	0.43	0.50	227	0.49	0.50
<b>I: Sub-EQ 2.3: Financial coping mechanisms</b>						
Coping through own savings	157	0.19	0.39	227	0.30	0.46
Obtained credit for livestock	157	0.17	0.37	227	0.12	0.32
Obtained credit for food	157	0.61	0.49	227	0.58	0.49
Obtained credit for other expenses	157	0.30	0.46	227	0.19	0.39
<b>J: Sub-EQ 2.4: Access to and use of financial services (yes/no)</b>						
Access mobile banking account	157	0.31	0.46	227	0.33	0.47
Use mobile banking account (with account)	48	0.19	0.39	74	0.30	0.46
Use mobile banking account	157	0.06	0.23	227	0.10	0.30
<b>K: Sub-EQ 3.1: Planned use of payouts (yes/no)</b>						
Food	73	0.89	0.31	110	0.92	0.28
Other household needs	73	0.60	0.49	110	0.53	0.50
Livestock activities	73	0.68	0.47	110	0.82	0.39
Non-livestock economic activities and other	73	0.37	0.49	110	0.45	0.50
<b>L: Sub-EQ 3.1: Planned share of payout</b>						
Food	73	0.43	0.27	110	0.45	0.25
Other household needs	73	0.18	0.19	110	0.14	0.15
Livestock activities	73	0.25	0.23	110	0.30	0.24
Non-livestock economic activities	73	0.14	0.24	110	0.11	0.16
<b>M: Sub-EQ 3.3: Livestock accounting: losses, oftakes, sales</b>						
No. of livestock lost in 2018-19	157	6.31	8.77	227	6.19	9.87

Variables	Female-headed households			Male-headed households		
	No. of observations	Mean	Std. dev.	No. of observations	Mean	Std. dev.
Number of Camels lost in 2018-19	157	0.85	2.23	227	0.70	2.36
Number of Cows lost in 2018-19	157	0.97	1.39	227	1.12	1.92
Number of Shoats lost in 2018-19	157	4.49	7.14	227	4.37	7.78
Livestock lost (TLU) in 2018-19	157	2.61	4.15	227	2.54	4.70
Number of livestock taken off in 2018-19	157	0.32	0.96	227	0.42	1.36
Livestock taken off (TLU) in 2018-19	157	0.17	0.86	227	0.08	0.29
No. of livestock sold in 2018-19	157	2.29	3.37	227	3.61	4.72
Livestock sold (TLU) in 2018-19	157	0.69	1.03	227	0.93	1.22
<b>N: Sub-EQ 4.1: Sufficiency of food intake and nutritional status of children</b>						
Total HFIAS (0-27)	157	12.01	6.64	227	13.66	6.42
Smaller meals than needed (HFIAS Q5) (ever) (yes/no)	157	0.85	0.36	227	0.90	0.30
Fewer than 3 meals per day (HFIAS Q6) (ever) (yes/no)	157	0.82	0.38	227	0.89	0.31
Went to sleep at night hungry (HFIAS Q8) (ever) (yes/no)	157	0.40	0.49	227	0.53	0.50
All day and night hungry (HFIAS Q9) (ever) (yes/no)	157	0.64	0.48	227	0.72	0.45
MUAC result: severely acutely malnourished	89	0.06	0.23	147	0.05	0.21
MUAC result: moderately acutely malnourished	89	0.11	0.32	147	0.14	0.34
MUAC result: at risk of acute malnutrition	89	0.20	0.40	147	0.35	0.48
MUAC result: well nourished	89	0.63	0.49	147	0.46	0.50
<b>O: Sub-EQ 4.2: Minimum Dietary Diversity of Women (MDDW)</b>						
MDD-W Score (0-10)	151	1.78	0.91	200	1.55	0.77
<b>P: Sub-EQ 4.3: Food expenditure</b>						
Total monthly expenditure (ETB)	157	1676.69	1479.96	227	1611.84	1241.87
Share of food in total expenditure	157	0.67	0.17	227	0.69	0.17

Source: C4ED analysis of endline data.

**Table XVII: Values for mobile banking use based on HelloCash secondary data**

Variable (yes/no)	SIPE Treatment		
	No. of observations	Mean	Std. dev.
Money cashed in	3,142	0.08	0.27
Money cashed out	3,142	0.06	0.24
Person-to-person transaction	3,142	0.08	0.27
Mobile phone top up	3,142	0.06	0.23

*Source:* HelloCash Secondary Data from WFP.



### **ANNEX 3: SIIPE IMPACT ESTIMATES**

The programme effects presented in the following were estimated as the difference in post-programme outcomes between SIIPE Treatment and SIIPE Pure Control households at follow up. The estimation follows the Propensity Score Matching approach where SIIPE beneficiaries are matched (compared) to their most similar counterparts in the Pure Control group. The set of matching variables is presented under model (4) in Table II in Annex A1-e.

**Table XVIII: Programme effects on Sub-EQ 1.1: Livestock-related investments**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	KM	NN	KM	NN	KM	NN	KM	NN	KM	NN
<b>A.1: Livestock-related investments (yes/no)</b>										
<b>Outcome variable</b>	Has purchased livestock		Has purchased camel		Has purchased cow		Has purchased shoat		Purchase forage/fodder	
<b>Effect</b>	0.034	0.019	0.014*	0.016*	0.014	0.003	-0.006	-0.024	0.073	0.112
<b>(Standard error)</b>	(0.036)	(0.048)	(0.008)	(0.008)	(0.020)	(0.024)	(0.032)	(0.044)	(0.073)	(0.092)
<b>No. of observations</b>	840	840	840	840	840	840	840	840	840	840
<b>A.2: Livestock-related investments (yes/no) (cont'd)</b>										
<b>Outcome variable</b>	Has purchased veterinary medicine/services		Has purchased water or other							
<b>Effect</b>	0.115	0.096	-0.173*	-0.181						
<b>(Standard error)</b>	(0.114)	(0.122)	(0.103)	(0.117)						
<b>No. of observations</b>	840	840	840	840						

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	KM	NN	KM	NN	KM	NN	KM	NN	KM	NN
<b>B: Absolute livestock-related expenditure (ETB)</b>										
<b>Outcome variable</b>	Total livestock-related expenditure		Expenditure on livestock		Expenditure on forage/fodder		Expenditure on veterinary medicine/services		Expenditure on water or other	
<b>Effect</b>	416.2	532.4	549.3	447.0	137.5	315.6	76.22	60.43	-271.2	-328.3
<b>(Standard error)</b>	(521.7)	(734.8)	(457.3)	(642.2)	(255.8)	(363.9)	(67.71)	(81.92)	(232.4)	(273.1)
<b>No. of observations</b>	845	845	840	840	840	840	840	840	840	840

The unit of observations is the household. Bootstrapped standard errors clustered at *sub-kebele* level in parentheses, from 1,000 replications. KM indicates effects estimated using kernel matching, NN indicates effects estimated using nearest neighbour matching. The list of matching variables is presented in Table II in annex A-1e. Significance levels: \*\*\* 1%, \*\* 5%, \* 10%.

Source: C4ED analysis of endline data.

**Table XIX: Programme effects on Sub-EQ 1.3 – 1.5**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	KM	NN	KM	NN	KM	NN	KM	NN	KM	NN
<b>A: Sub-EQ 1.3: Coping mechanisms and distress sales</b>										
<b>Outcome variable</b>	Number of coping strategies (out of 18)		Has carried out livestock distress sales (yes/no)		Has vaccinated/ animals or used veterinary services (yes/no)		Has relied on remittances (yes/no)		Migration of household member(s) (yes/no)	
<b>Effect (Standard error)</b>	0.261 (0.650)	0.372 (0.783)	0.008 (0.062)	0.016 (0.082)	0.103* (0.056)	0.125* (0.070)	-0.073* (0.038)	-0.066 (0.057)	0.070** (0.035)	0.072 (0.045)
<b>No. of observations</b>	840	840	840	840	840	840	840	840	840	840
<b>B: Sub-EQ 1.4: Income diversification</b>										
<b>Outcome variable</b>	Total income (ETB)		Has received income from livestock sales (yes/no)		Has received income from PSNP (yes/no)					
<b>Effect (Standard error)</b>	-327.9 (502.3)	-431.9 (618.0)	0.194*** (0.070)	0.197** (0.093)	241.2 (478.5)	0.048 (581.6)				
<b>No. of observations</b>	840	840	840	840	840	840				

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	KM	NN	KM	NN	KM	NN	KM	NN	KM	NN
<b>C: Sub-EQ 1.5: Stability of income sources</b>										
<b>Outcome variable</b>	Number of months without income		Share of income from stable income sources		Income share from PSNP transfer					
<b>Effect</b>	0.073	0.003	-0.143**	-0.121	-0.115*	-0.102				
<b>(Standard error)</b>	(0.262)	(0.309)	(0.062)	(0.080)	(0.062)	(0.082)				
<b>No. of observations</b>	840	840	799	799	799	799				

The unit of observation is the household. Bootstrapped standard errors clustered at *sub-kebele* level in parentheses, from 1,000 replications. KM indicates effects estimated using kernel matching, NN indicates effects estimated using nearest neighbour matching. The list of matching variables is presented in Table II in annex A-1e. Significance levels: \*\*\* 1%, \*\* 5%, \* 10%.

Source: C4ED analysis of endline data.

**Table XX: Programme effects on Sub-EQ 2.1: Awareness and understanding of insurance and SIPE**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	KM	NN	KM	NN	KM	NN	KM	NN	KM	NN
<b>A: Awareness and understanding of insurance</b>										
<b>Outcome variable</b>	Has heard of insurance (yes/no)		Knows of livestock insurance (yes/no)		Has purchased insurance (yes/no)		At least somewhat understand insurance (yes/no)		Knowledge of insurance: number of correct responses to 7 test questions [0,7]	
<b>Effect</b>	0.249***	0.239**	0.287***	0.280***	0.111**	0.113**	0.250***	0.208**	0.387	0.553
<b>(Standard error)</b>	(0.086)	(0.104)	(0.084)	(0.100)	(0.043)	(0.050)	(0.084)	(0.097)	(0.506)	(0.547)
<b>No. of observations</b>	840	840	504	504	504	504	504	504	153	153
<b>B: Awareness and understanding of SIPE</b>										
<b>Outcome variable</b>	Has heard of SIPE (yes/no)		Knowledge of SIPE: number of correct responses to test 10 questions [0,10]							
<b>Effect</b>	0.395***	0.468***	0.382	0.658						
<b>(Standard error)</b>	(0.081)	(0.095)	(0.691)	(0.797)						
<b>No. of observations</b>	504	504	232	232						

The unit of observation is the household. Bootstrapped standard errors clustered at *sub-kebele* level in parentheses, from 1,000 replications. KM indicates effects estimated using kernel matching, NN indicates effects estimated using nearest neighbour matching. The list of matching variables is presented in Table II in annex A-1e. Significance levels: \*\*\* 1%, \*\* 5%, \* 10%. *Source*: C4ED analysis of endline data.

**Table XXI: Programme effects on Sub-EQ 2.2 and 2.4**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	KM	NN	KM	NN	KM	NN	KM	NN	KM	NN
<b>A: Sub-EQ 2.2: Willingness to pay (WTP) for livestock insurance</b>										
<b>Outcome variable</b>	Willingness to pay (yes/no)		WTP for one TLU (in ETB)							
<b>Effect</b>	0.237***	0.242***	89.481	212.407						
<b>(Standard error)</b>	(0.069)	(0.087)	(135.997)	(155.416)						
<b>No. of observations</b>	840	840	307	307						
<b>B: Sub-EQ 2.4: Access to and use of financial services</b>										
<b>Outcome variable</b>	Access mobile banking account		Use mobile banking account		Use mobile banking account (with account)					
<b>Effect</b>	0.228***	0.218***	-0.232	-0.189	-0.003	-0.011				
<b>(Standard error)</b>	(0.059)	(0.066)	(0.240)	(0.261)	(0.042)	(0.052)				
<b>No. of observations</b>	840	840	145	145	840	840				

The unit of observation is the household. Bootstrapped standard errors clustered at *sub-kebele* level in parentheses, from 1,000 replications. KM indicates effects estimated using kernel matching, NN indicates effects estimated using nearest neighbour matching. The list of matching variables is presented in Table II in annex A-1e. Significance levels: \*\*\* 1%, \*\* 5%, \* 10%.

Source: C4ED analysis of endline data.

**Table XXII: Programme effects on Sub-EQ 3.3: Livestock losses**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	KM	NN	KM	NN	KM	NN	KM	NN	KM	NN
<b>A: Livestock losses, by animal</b>										
<b>Outcome variable</b>	Number of Camels lost in 2018-2019		Number of Cows lost in 2018-2019		Number of Shoats lost in 2018-2019					
<b>Effect</b>	-0.083	0.117	0.090	0.093	1.691***	1.809**				
<b>(Standard error)</b>	(0.548)	(0.672)	(0.225)	(0.291)	(0.634)	(0.802)				
<b>No. of observations</b>	840	840	840	840	840	840				
<b>B: Livestock losses, overall</b>										
<b>Outcome variable</b>	Number of livestock lost in 2018-2019		Share of livestock lost in 2018-2019		Value of livestock lost (mean purchasing price, ETB)		Value of livestock lost (mean selling price, ETB)			
<b>Effect</b>	1.698*	2.019*	-0.021	-0.040	1,358	3,233	2,837	4,898		
<b>(Standard error)</b>	(0.872)	(1.070)	(0.030)	(0.042)	(4,791)	(5,887)	(5,141)	(6,306)		
<b>No. of observations</b>	840	840	843	843	840	840	840	840		



	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	KM	NN	KM	NN	KM	NN	KM	NN	KM	NN
<b>C: Livestock losses, TLU</b>										
<b>Outcome variable</b>	Livestock lost (TLU) in 2018-2019		Share of livestock lost (TLU) in 2018-2019		Value of livestock lost (TLU) (mean purchasing price, ETB)		Value of livestock lost (TLU) (mean selling price, ETB)			
<b>Effect</b>	0.143	0.438	-0.022	-0.043	-764.9	1,971	-849.6	2,245		
<b>(Standard error)</b>	(0.773)	(0.954)	(0.033)	(0.047)	(7,381)	(9,083)	(8,346)	(10,273)		
<b>No. of observations</b>	840	840	843	843	840	840	840	840		

The unit of observation is the household. Bootstrapped standard errors clustered at *sub-kebele* level in parentheses, from 1,000 replications. KM indicates effects estimated using kernel matching, NN indicates effects estimated using nearest neighbour matching. The list of matching variables is presented in Table II in annex A-1e. Significance levels: \*\*\* 1%, \*\* 5%, \* 10%.

Source: C4ED analysis of endline data.

**Table XXIII: Programme effects on Sub-EQ 3.3: Livestock offtakes**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	KM	NN	KM	NN	KM	NN	KM	NN	KM	NN
<b>A: Livestock offtakes, by animal</b>										
<b>Outcome variable</b>	Number of Camels taken off in 2018-2019		Number of Cows taken off in 2018-2019		Number of Shoats taken off in 2018-2019					
<b>Effect</b>	-0.065	-0.032	0.010	0.027	0.026	0.035				
<b>(Standard error)</b>	(0.086)	(0.126)	(0.026)	(0.036)	(0.148)	(0.210)				
<b>No. of observations</b>	840	840	840	840	840	840				
<b>B: Livestock offtakes, overall</b>										
<b>Outcome variable</b>	Number of livestock taken off in 2018-2019		Share of livestock offtaken in 2018-2019		Value of livestock offtaken (mean purchasing price, ETB)		Value of livestock offtaken (mean selling price, ETB)			
<b>Effect</b>	-0.029	0.029	-0.004	-0.001	-498.3	-134.9	-495.9	-99.80		
<b>(Standard error)</b>	(0.168)	(0.244)	(0.005)	(0.008)	(761.9)	(1,121)	(822.2)	(1,216)		
<b>No. of observations</b>	840	840	843	843	840	840	840	840		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	KM	NN	KM	NN	KM	NN	KM	NN	KM	NN
<b>C: Livestock offtakes, TLU</b>										

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	KM	NN	KM	NN	KM	NN	KM	NN	KM	NN
<b>Outcome variable</b>	Livestock offtaken (TLU) in 2018-2019		Share of livestock offtaken (TLU) in 2018-2019		Value of livestock offtaken (TLU) (mean purchasing price, ETB)		Value of livestock offtaken (TLU) (mean selling price, ETB)			
<b>Effect</b>	-0.078	-0.015	-0.004	-0.000	-843.3	-326.5	-952.0	-364.7		
<b>(Standard error)</b>	(0.124)	(0.180)	(0.006)	(0.010)	(1,181)	(1,721)	(1,337)	(1,946)		
<b>No. of observations</b>	840	840	843	843	840	840	840	840		

The unit of observation is the household. Bootstrapped standard errors clustered at *sub-kebele* level in parentheses, from 1,000 replications. KM indicates effects estimated using kernel matching, NN indicates effects estimated using nearest neighbour matching. The list of matching variables is presented in Table II in annex A-1e. Significance levels: \*\*\* 1%, \*\* 5%, \* 10%.

Source: C4ED analysis of endline data.

**Table XXIV: Programme effects on Sub-EQ 3.4: Livestock sales**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	KM	NN	KM	NN	KM	NN	KM	NN	KM	NN
<b>A: Livestock sold, by animal</b>										
<b>Outcome variable</b>	Number of Camels sold in 2018-2019		Number of Cows sold in 2018-2019		Number of Shoats sold in 2018-2019					
<b>Effect</b>	-0.001	-0.051	0.017	-0.019	0.531	0.274				
<b>(Standard error)</b>	(0.090)	(0.104)	(0.086)	(0.109)	(0.450)	(0.639)				
<b>No. of observations</b>	840	840	840	840	840	840				
<b>B: Livestock sold, overall</b>										
<b>Outcome variable</b>	Number of livestock sold in 2018-2019		Share of livestock sold in 2018-2019		Value of livestock sold (mean selling price, ETB)					
<b>Effect</b>	0.547	0.205	-0.013	-0.005	1,066	-36.75				
<b>(Standard error)</b>	(0.484)	(0.675)	(0.019)	(0.026)	(1,337)	(1,704)				
<b>No. of observations</b>	840	840	843	843	840	840				

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	KM	NN	KM	NN	KM	NN	KM	NN	KM	NN
<b>C: Livestock sold, TLU</b>										
<b>Outcome variable</b>	Livestock sold (TLU) in 2018-2019		Share of livestock sold (TLU) in 2018-2019		Value of livestock sold (TLU) (mean selling price, ETB)					
<b>Effect</b>	0.069	-0.062	-0.019	-0.014	65.97	-866.7				
<b>(Standard error)</b>	(0.155)	(0.189)	(0.017)	(0.022)	(1,365)	(1,599)				
<b>No. of observations</b>	840	840	843	843	840	840				

The unit of observation is the household. Bootstrapped standard errors clustered at *sub-kebele* level in parentheses, from 1,000 replications. KM indicates effects estimated using kernel matching, NN indicates effects estimated using nearest neighbour matching. The list of matching variables is presented in Table II in annex A-1e. Significance levels: \*\*\* 1%, \*\* 5%, \* 10%.

Source: C4ED analysis of endline data.

**Table XXV: Programme effects on Sub-EQ 4.2: Minimum Dietary Diversity of Women (MDDW)**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	KM	NN	KM	NN	KM	NN	KM	NN	KM	NN
<b>Outcome variable</b>	MDD-W Score (0-10)		Only consumed grain (yes/no)		Consumed any fruit/vegetable (yes/no)		Ate dairy (yes/no)			
<b>Effect</b>	-	-0.388*	0.196**	0.209**	-0.149*	-0.136	-0.154**	-0.142		
<b>(Standard error)</b>	(0.169)	(0.200)	(0.088)	(0.103)	(0.082)	(0.100)	(0.077)	(0.095)		
<b>No. of observations</b>	795	795	795	795	795	795	795	795		

The unit of observation are women in reproductive age (aged 15-49) years. Bootstrapped standard errors clustered at *sub-kebele* level in parentheses, from 1,000 replications. KM indicates effects estimated using kernel matching, NN indicates effects estimated using nearest neighbour matching. The list of matching variables is presented in Table II in annex A-1e. Significance levels: \*\*\* 1%, \*\* 5%, \* 10%.

Source: C4ED analysis of endline data.

## ANNEX 4: BIBLIOGRAPHY

Agency for Rangeland Information and Development in Kenya (2018): Index-based livestock insurance as an innovative tool against drought loss: Good practices and impact analysis from northern Kenya. Wageningen, The Netherlands: CTA

Caliendo, M., Kopenig, S. and Kopeinig, S. (2005): Some Practical Guidance for the Implementation of Propensity Score Matching. *DIW Discussion Paper*, 485(1588), pp. 1–29.

Chantararat, S., Mude, A. G., & Barrett, C. B. (2009): Willingness to pay for index based livestock insurance: Results from a field experiment in northern Kenya.

Chantararat, S., A.G. Mude, C.B. Barrett and M.R. Carter (2013): Designing Index-Based Livestock Insurance for Managing Asset Risk in Northern Kenya. *Journal of Risk and Insurance*. Volume 80(1), pp. 205–237, March 2013

Coates J., Swindale A., Bilinsky P. (2007): Household Food Insecurity Access Scale (HFIAS) for Measurement of Household Food Access: Indicator Guide (v. 3). Washington, D.C.: Food and Nutrition Technical Assistance Project, Academy for Educational Development.

Cole, S.; Bastian, G.; Vyas, S.; Wendel, C.; Stein, D. (2012): Systematic Review. The effectiveness of index-based micro-insurance in helping smallholders manage weather-related risks. EPPI-Centre, Social Science Research Unit, Institute of Education, University of London, London, UK.

FAO (2017): Ethiopia - Drought response plan and priorities in 2017.

Filmer, D. and Scott, K. (2008): Assessing Asset Indices. (WPS 4605)

Food Economy Group (2015): Regional Overview and Summary of the Results of the 2015 Household Economy Analysis. Baseline Update, Somali Region, Ethiopia.

Jensen, N., Barrett C., Mude, A. (2015): The Favourable Impacts of Index-Based Livestock Insurance: Evaluation results from Ethiopia and Kenya. ILRI research brief 52, May 2015.

Jokhio, S., Abro, M.M.Q., Alaali, L. (2016): Managing risk in livestock farming: The role of insurance companies. *International Journal of Financial Research*, 7(2). 64-72.

Keno, T., Diriba, D. & Lemesa, T. (2018): Participatory research on the effectiveness of Index based Livestock Insurance as a pro-poor climate risk management strategy in Borena zone: the case of Moyale and Miyo districts.

Kinati, W. and Mulema, A. A. (2018): Gender issues in livestock production in Ethiopia. Nairobi, Kenya: ILRI.

Lybbert, T.J., Barrett C.B., Desta S., and Coppock D. L. (2004): Stochastic Wealth Dynamics and Risk Management among a Poor Population. *Economic Journal* 114 (498), pp. 750-777.

Rasmussen J., Andersen A., Fisker A.B., Ravn H., Sodemann M., Rodrigues A., Benn C.S., Aaby P. (2012): Mid-upper-arm-circumference and mid-upper-arm circumference z-score: The best predictor of mortality? *Eur. J. Clin. Nutr.* 2012;66:998–1003.

Rosenbaum, P. R. and Rubin, D. B. (1985): Constructing a Control Group using

Multivariate Matched Sampling Methods that incorporate the Propensity Score. *American Statistical Association*, 39(1).

Sianesi, B. (2004): An Evaluation of the Swedish Active Labor Market Programs in the 1990s. *The Review of Economics and Statistics*, 86(1), pp. 133–155.

Singh A.S., Hlophe N. M. (2017): Factors affecting adoption of livestock insurance: a case study of livestock farmers in Manzini Region, Swaziland. *Research Journal of Agriculture and Forestry Sciences*, 5(8), 6-14.

Toth, R. (2015): Traps and Thresholds in Pastoralist Mobility. *American Journal of Agricultural Economics*, 97 (1) 315-332.



**WFP Country Office Ethiopia**

