



## PRIME: ENDLINE SURVEY REPORT



## ACRONYMS AND ABBREVIATIONS

<b>AISDA</b>	Action for Integrated Sustainable Development Association
<b>ACPA</b>	Aged and Children Pastoralist Association
<b>AE</b>	Adult Equivalent
<b>CAHW</b>	Community Animal Health Workers
<b>DID</b>	Difference in Differences
<b>ECDD</b>	Ethiopian Center for Disability and Development
<b>ETB</b>	Ethiopian Birr
<b>FGD</b>	Focus group discussions
<b>FSA</b>	Friendship Support Association
<b>FTFMS</b>	Feed the Future Monitoring System
<b>GCC</b>	Global Climate Change
<b>HAVOYOCO</b>	Horn of Africa Volunteer Youth Committee
<b>HH</b>	Household
<b>ID</b>	Identification
<b>IR</b>	Intermediate Result
<b>LQAS</b>	Lot Quality Assurance Sampling
<b>MC</b>	Mercy Corps
<b>M&amp;E</b>	Monitoring & Evaluation
<b>MFI</b>	Microfinance Institution
<b>MV</b>	Multivariate
<b>NFE</b>	Non-Food Expenditure
<b>NGO</b>	Non-Governmental Organization
<b>ODK</b>	Open Data Kit

<b>OLS</b>	Ordinary Least Square
<b>PLW</b>	Pregnant and Lactating Women
<b>PRIME</b>	Pastoralist Areas Resilience Improvement through Market Expansion
<b>PVP</b>	Private Veterinary Pharmacies
<b>RCT</b>	Randomized Controlled Trial
<b>RUSACO</b>	Rural Saving and Credit Cooperatives
<b>SD</b>	Standard Deviation
<b>UNICEF</b>	United Nations Children's Fund
<b>USAID</b>	United States Agency for International Development
<b>USD</b>	United States Dollar
<b>USG</b>	United States Government
<b>VSLA</b>	Village-level Savings and Loan Association

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## EXECUTIVE SUMMARY

In recent decades, recurrent droughts have altered the lives and livelihoods of millions of people in the dryland regions of Ethiopia. Beginning in 2012, the United States Agency for International Development (USAID) launched a 5-year project, named the Pastoralist Areas Resilience Improvement through Market Expansion (PRIME), to increase vulnerable communities' resilience to climate change and reduce hunger and poverty. This endline report presents findings on whether PRIME achieved its overall objective in the Afar, Oromiya and Somali woredas where it was implemented. It also recommends further investigations prior to developing additional interventions (e.g. PRIME Phase Two), and considerations for defining any future monitoring and evaluation (M&E) plan.

In terms of objectives, this report addresses whether PRIME improved: the use of animal health services provided by community animal health workers (CAHW) and private veterinary pharmacies (PVP); dietary diversity of children aged 6-to-23 months and pregnant and lactating women (PLW); and nominal income. Finally, it addresses whether PRIME reduced the prevalence of hunger. Data for assessing these objectives were collected by Kimetrica during three survey rounds conducted during three project periods: prior to inception (baseline 2013), mid-intervention of project (midline 2015) and at end-of-project (endline 2017). Unless otherwise indicated, this summary presents changes between the baseline and endline survey periods.

Of note was the occurrence of severe droughts during implementation of PRIME. They struck the Afar Region in 2014 and Somali Region in 2015, both of which ended in 2016. During 2015-2016 Oromiya Region was also hit by drought. Results should be considered in the context of these shock events and their associated recovery periods. It is important to note that the drought in Afar was categorized, by remote sense data, of a magnitude expected to happen only every 100 years.

Despite droughts, this evaluation suggests that PRIME activities improved households' use of animal health services, nominal income and dietary diversity of children aged 6-to-23 months between 2013 and 2017. PRIME surpassed end-of-project targets for both use of PVP and nominal income

### **Use of animal health services**

Project-wide, household use of CAHW remained constant and failed to reach the 33 percent target threshold by 5 percentage points. In contrast, use of PVP surpassed its end-of-project target goal of 17.1 percent, by 5 percentage points. All regions experienced gains but Oromiya presented the most. Collectively, PRIME is associated with increasing household use of PVP by five percent. Impact evaluation estimates were not statistically significant for CAHW.

While PRIME missed its end-of-project CAHW target, performance across regions, particularly in Somali, have important implications for the design of future CAHW-oriented interventions. Use of CAHW increased over the life of the project in Afar and Oromiya, and declined in Somali Region. The latter occurred despite PRIME having trained a cadre of CAHW in 2014. According

to a 2016 qualitative evaluation, area households preferred CAHW over PVP but the former were not easily available in the area. A key informant said that CAHW services might be decreasing over time as more veterinary graduates were providing the same services.

Going forward, it will be important to find 2014 CAHW trainees in Somali Region to understand why they stopped providing services. Collecting qualitative data on CAHW availability in Afar and Oromiya for comparison with Somali would also shed light on whether “use of CAHW” should be a next phase objective.

### **Dietary Diversity**

Small sample sizes affected the analysis of dietary diversity indicators. These needed a different evaluation: a larger sample size and a shorter (less than two years) period of analysis. Therefore, some results were found to be not statistically significant.

The end-of-project target of seven percent of infants consuming four or more food groups was missed by one percentage point. PLW consumed in 2017 on average, two, not the end-of-project target of five food groups. However, in terms of impact, PRIME is associated with an increase equivalent to 0.24 food groups in infants’ diet and 0.19 in PLW’s. Across regions, Oromiya experienced a large increase between baseline and midline and hit a plateau thereafter. No changes were seen in Afar or Somali. This trend was similar for infant and PLW dietary diversity.

Looking ahead, it will be necessary to understand why infant and PLW dietary diversity improved in Oromiya between 2013 and 2015 and remained unchanged thereafter. This will help to clarify whether these are the best indicators to measure project results related to nutrition. If they are, the follow up project’s M&E plan should include an evaluation specific to dietary diversity indicators. It should be performed within a one or two-year period to assure rigorous comparison across households over time.

### **Nominal income**

PRIME’s original end-of-project target, a 10 percent rise in household nominal income, was surpassed by an increase equivalent to 78 percent. Afar was the only region where nominal income remained constant, but this result masks a recovery over the last two years. Earlier, income would have fallen because of the drought. In terms of impact, PRIME increased nominal annual income by USD 223.

### **Self-reported prevalence of hunger**

Hunger appears to have increased over the life of PRIME, but there are reasons to doubt the extent. Results show that the percentage of households self-reporting moderate or severe hunger increased from 19 to 39 percent. A decrease to 13 percent was the original end-of-project target.

However, in Somali Region for example, while households reported that hunger almost doubled, results also show that real income and daily food expenditure grew over the same period.

Moreover, the kcal available did not change. It is clear that self-reported prevalence of hunger in this region is overestimated.

Given these findings, it is recommended that the follow-up project should not use the household hunger scale. Its susceptibility to respondent bias is well-documented. Instead, the project should explore a range of hunger indicators, including consumption expenditures and kcal intake, and triangulate across these for steadier results.

## 1. INTRODUCTION

Recurrent drought in the northern, eastern, and southern regions of Ethiopia has had wide-ranging and long-term development impact on households. These climate shocks require interventions beyond humanitarian emergency response to reduce future negative impacts. Recently, the 2015-2016 drought led to eight million people in need of food assistance including 1.4 million children under the age of five.<sup>1</sup> It also decimated primary sources of income. For example, residents in Borena Zone (Oromiya Region) lost 70 percent of their cattle thereby slowing many households' ability to recover.

PRIME, a five-year project, was launched in 2012 to help vulnerable pastoralist communities become more resilient to shocks of this nature. Led by Mercy Corps, PRIME is a consortium of 10 organizations whose main objective is to reduce poverty and hunger in the drought-prone Afar, Oromiya and Somali regions. To accomplish these objectives, PRIME implements market-driven approaches to livestock production and livelihood diversification that simultaneously support dryland communities to adapt to a changing climate. As part of its project activities, PRIME developed a monitoring and evaluation (M&E) plan to assess the project's overall impact and the performance of related indicators (impact, outcome and output), and custom indicators on animal health services and the dietary diversity of infants and pregnant and lactating women.

Kimetrica is a consortium member supporting the M&E component of PRIME. As such, we have conducted six different surveys in the last five years. This report presents results from three surveys: the baseline (2013), midline (2015) and endline (2017). Newly available endline survey data are included herewith, in an analysis of a panel of 932 households (HHs) across the three regions. Its findings and recommendations are intended to evaluate the impact of the project, and to inform and guide the definition of indicators and targets in any follow-up interventions and projects.

The remainder of this endline report is divided into the following sections: Project background; Endline survey; Methodology; Main findings; Conclusions and recommendations.

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<sup>1</sup>United Nations Children's Fund (UNICEF) at <https://www.unicef.org/africadrought/facts.htm>

## 2. PROJECT BACKGROUND

This section briefly describes the PRIME Project, its components, and how activities are implemented in the Afar, Oromiya and Somali regions.

### 2.1. PRIME PROJECT

PRIME is a five-year USAID-funded project designed to reduce poverty and hunger among Ethiopian pastoralist communities and increase their resilience to climate change. The project is financed through USAID's Feed the Future and Global Climate Change (GCC) agencies. PRIME utilizes a variety of methodologies relying on market-driven approaches to livestock production and livelihood diversification. The project also supports dryland communities' adaptation to a changing climate. To achieve its goals, the project works to meet the following Intermediate Results (IRs):

- IR1: Improve productivity and competitiveness of livestock and livestock products.
- IR2: Enhance pastoralists' adaptation to climate change.
- IR3: Strengthen alternative livelihoods for households (HHs) transitioning out of pastoralism.
- IR4: Ensure enhanced innovation, learning and knowledge management.
- IR5: Improve nutritional status of targeted HHs through targeted, sustained and evidence-based interventions.

Embedded within each of these IRs are two cross-cutting objectives: the inclusion of women and people with disabilities.

Mercy Corps is the lead implementing organization of the PRIME consortium.<sup>2</sup> Each member works on at least one IR, and each IR has a leader and team responsible for implementing its related activities. There are more than 20 types of activities that PRIME develops or supports, like: trainings on the use of fodder, handling livestock or the nutrition needs of pregnant and lactating women (PLW); rangeland restoration; loan access for women or livestock traders; and using theater or circus groups to promote the importance of nutrition during the first 1,000 days of a child's development. PRIME also offers competitive cost-shared business grants for private veterinary pharmacies feedlots, as well as grants for establishing milk processing plants and slaughterhouses.

Management oversees the following phases: activity initiation, implementation and reporting. All phases of PRIME are monitored via an online system, *ki-projects*<sup>™</sup>, developed by Kimetrica for the purpose of enabling Mercy Corps to link management phases with performance evaluation.

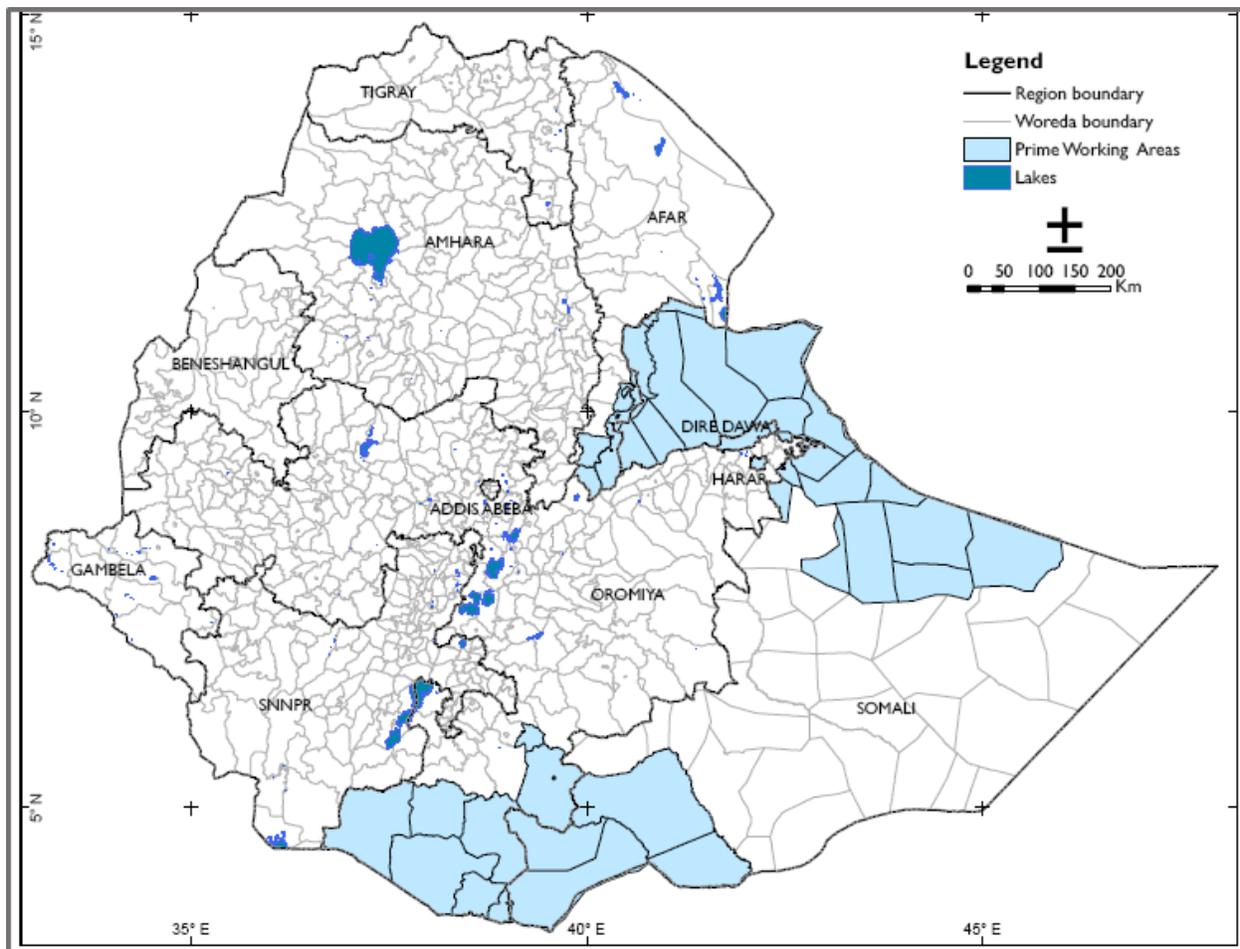
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<sup>2</sup> PRIME is a consortium composed by 10 organizations: Mercy Corps (MC), CARE, Aged and Children Pastoralist Association (ACPA), Ethiopian Center for Disability and Development (ECDD), the Horn of Africa Volunteer Youth Committee (HAVOYOCO), Haramaya University, Kimetrica, SOS Sahel, Friendship Support Association (FSA) and Action for Integrated Sustainable Development Association (AISDA).

## 2.2. PRIME: PROJECT AREA, TARGET HOUSEHOLD NUMBERS, AND IR ACTIVITIES

PRIME's implementation area is comprised of 46 woredas in the Afar, Oromiya and Somali regions (Figure 1). Their total population is estimated at 5.9 million people living in an area that is approximately 202,000 square kilometers. PRIME had the objective of reaching 250,000 households (HHs) by end-of-project. At the time of the midline survey (Oct 2012-Sep 2015), it reached 138,861 HHs and 257,212 by the end-of-project (Oct 2012- September 2017).

Figure 1: Map of three PRIME operational areas



PRIME activities have both direct and indirect beneficiaries. Activities where individuals are enrolled and named, such as trainings and organized events, result in direct beneficiaries. Activities that produce community-wide benefits, such as a pond construction, result in indirect

beneficiaries. All PRIME beneficiaries participate in or benefit from one or more than one activity led by the IR1, IR2, IR3 and IR5 teams.<sup>3,4</sup>

## 2.3. THE MONITORING AND EVALUATION PLAN

As part of IR4, PRIME developed an M&E plan to track and measure impact, outcome and output indicators over the life of the project. This included summarizing impacts during two periods, mid-term and end-of-project, using data collected during the baseline, midline and endline surveys. Each survey was conducted on a panel of randomly-selected sample HHs located in PRIME woredas, across the three regions. Data from these surveys were used to evaluate the performance and impact of the following PRIME indicators:

- **Percentage of HHs accessing animal health services** - measured as use of 1) a private veterinary pharmacies (PVP); 2) a community animal health workers (CAHW); or 3) PVP or CAHW, herein referred to as 'general use'.
- **Dietary diversity of women aged 15-49** - measured as the total number of food groups, out of a total of nine, that were consumed by pregnant and lactating women (PLW) in the 24 hours prior to the survey.
- **Dietary diversity of children aged 6-to-23 months** - measured as the percentage of infants who consumed four or more food groups, out of a total of seven, in the 24 hours prior to the survey.
- **Prevalence of HHs with moderate or severe hunger** - measured as the percentage of HHs self-reporting moderate or severe hunger in the last month, using the HH hunger scale.

As per USAID request, this report does not cover the prevalence of poverty indicator—measured as the percentage of HHs living on less than USD 3.10-a-day. USAID will separately measure this indicator for all Ethiopia projects that are part of Feed the Future. In its place, Kimetrica evaluated the impact and performance of nominal income, which was in the original M&E Plan. Until 2015, the project goal was to reduce hunger and increase income. After, the goal was changed to 'reduce hunger and poverty.'

- **Nominal income** — measured using food and non-food expenditure data.

In addition, to understand changes in the prevalence of hunger, Kimetrica calculated three other indicators:

- **Real income** — calculated as nominal income adjusted by inflation.
- **Daily food expenditure per adult equivalent** — measured using food expenditure, adjusted by inflation, per adult equivalent.

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<sup>3</sup> Activities from the IR4 team cross-cut all IRs, as they relate to the monitoring and evaluation (M&E) of the project.

<sup>4</sup> For a list of activities deployed in surveyed woredas between April and June 2017, see Annex 1.

- **Daily kcal available per adult equivalent** — measured as the kcal provided by food items purchased, harvested and received as gifts, by adult equivalent.<sup>5</sup>

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<sup>5</sup> This does not measure the kcal intake as we do not know how much of the food available was consumed.

### 3. ENDLINE SURVEY (2017)

The objective of the survey was to measure the performance and impact of PRIME as related to the indicators listed in section 2.3. This section describes the processes used in implementing the endline survey, conducted in April-May 2017, including questionnaire design, data collection, and data quality assurance methodologies.

#### 3.1. QUESTIONNAIRE DESIGN

Kimetrica used the same questionnaire for the endline survey as was used during the baseline and midline surveys. Some changes, following recommendations in the midline report, were made:

- Re-added a question to capture the price of HH assets. This allowed for a more accurate estimation of HH wealth.
- Re-included and refined the section on migration patterns with the expectation that this data could be used in another analysis.
- Dropped the income sections. Income information, at baseline and midline, was highly unreliable. Income calculations in this report were estimated using expenditure information, which is less biased.

The questionnaire was digitized using Kobo Collect, an ODK-compatible open-source software, prior to being field-tested in April 2017 in Somali Region. The Kobo questionnaire was developed in English, then translated into Amharic, Afari, Oromifa and Somali for use by the enumerators.<sup>6</sup>

#### 3.2. SAMPLE DEFINITION

At baseline, Mercy Corps provided Kimetrica with a list of 51 woredas where they anticipated PRIME would be working. Kimetrica randomly selected 21<sup>7</sup> woredas from this list, and surveyed 1,500 randomly-selected HHs. The sample size was determined by the number of HHs necessary to measure an effect when doing the impact evaluation at endline. This sample was never intended to represent the total number of HHs targeted by PRIME.

After the baseline data collection, the PRIME management team requested that six woredas in Oromiya Region be excluded from the baseline assessment. They decided not to work in those areas. This reduced the baseline sample to 1,095 HHs. The unavailability of some HHs later on—11 percent at midline and 12 percent at endline—resulted in an even smaller sample size. The total panel was 932 households, or 85 percent of all HHs in the baseline assessment (Figure 3). A decreased sample size can affect the statistical significance of estimates.

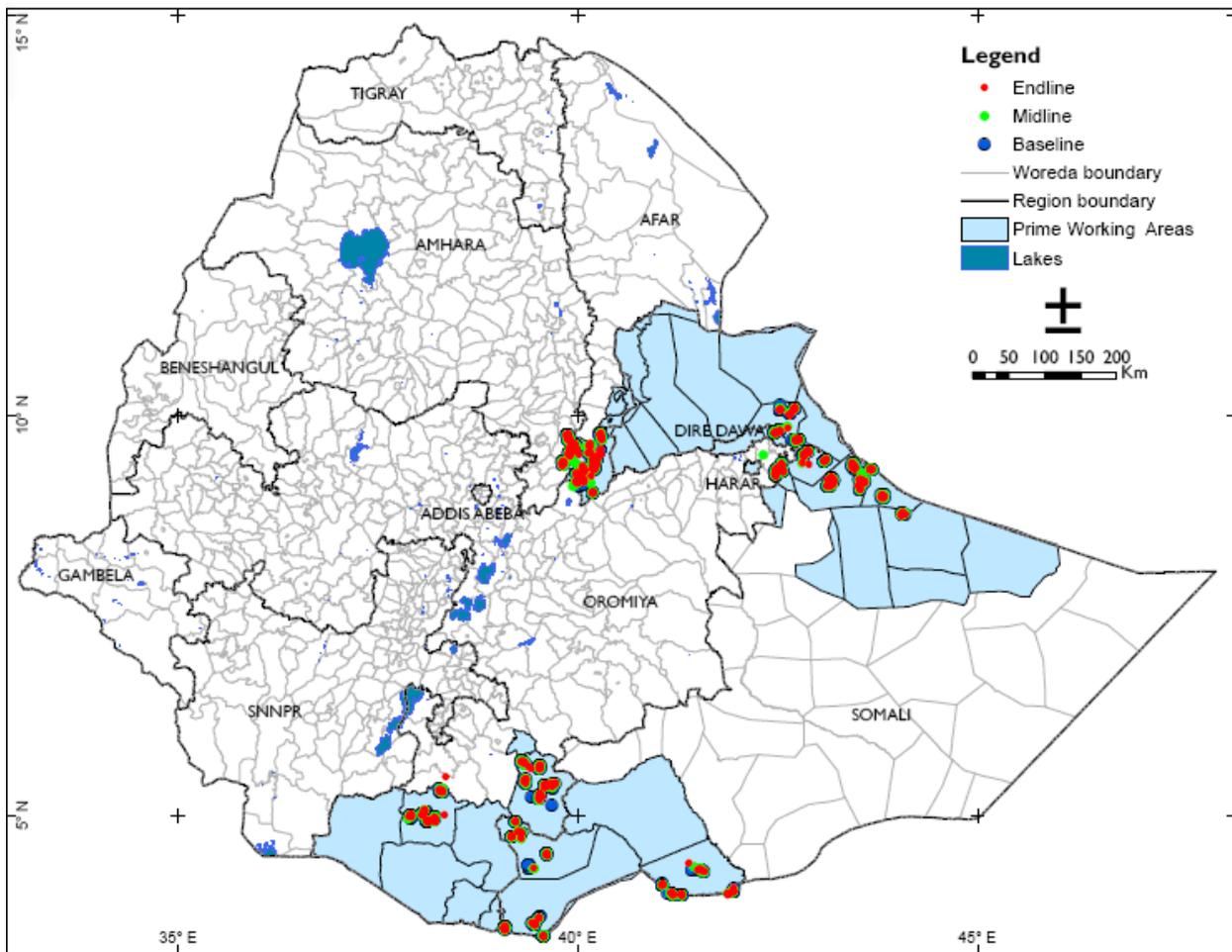
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<sup>6</sup> For a list of the sections included in the questionnaire, see Annex 3.

<sup>7</sup> This is the number of woredas that needed to be selected as per the statistical analysis performed by Kimetrica before the baseline survey.

However, as shown in section 5, most results even for Oromiya Region (which was affected by the drop at baseline of six woredas) were statistically significant.

Figure 2: Location of households surveyed at baseline, midline and endline



At 15 percent missing, the attrition rate for HHs was low across the three surveys, and this is due to the field team’s investigative efforts. Surveyed HHs belong to pastoralist communities, so it is expected that they move constantly. Many HHs initially marked as missing were found, however, because the field team sought and followed up on information from former neighbors.<sup>8</sup> Somali Region recorded the highest proportion of missing households because information gathered at baseline was not sufficient to find them during the midline or endline surveys.

<sup>8</sup> For this analysis, missing HHs (163, 15 percent) are those that could not be located even after investigation. Of the 163 missing HHs: 68 percent relocated before midline for unknown reasons (111 HHs); 20 percent relocated because of drought after midline (32 HHs); two percent relocated because of a job promotion after midline (4 HHs); and 10 percent relocated after midline due to unknown circumstances (16 HHs).

It is important to note that all three surveys—baseline, midline and endline—assumed that surveyed HHs are one of two types of beneficiaries, direct or indirect, due to PRIME’s comprehensive rather than household-specific approach to building resilience.

### 3.3. DATA COLLECTION, QUALITY ASSURANCE AND CLEANING

Data collection for the endline survey was conducted between 24 April and 18 May 2017. Parallel to the data collection efforts, supervisors and coordinators conducted three types of assurance checks in the field. One was a check on whether the enumerators understood how to use the tablets, and were asking questions correctly and fully completing the questionnaire before submission (*accompaniment check*). Supervisors and coordinators also spot-checked enumerators by visiting areas of work without prior notice. This was done to assure enumerators were visiting HHs and not making up data (*spot-check*). Finally, a random sample of at least 10 percent of HHs were re-visited by the supervisors, during which the HH respondent answered 19 randomly-selected questions from the survey. These questions were then compared to data collected by the enumerators (*back-check*).

The Lot Quality Assurance Sampling (LQAS) approach was used to compare the back-checked responses with those collected by enumerators during their HH visits. At baseline, the benchmark was set at 85 percent. For the midline and endline surveys, it was increased to 95 percent. Data collected during all three surveys reached the data quality benchmarks set.<sup>9</sup>

Data were synced to the server during collection, allowing for identification of issues in real time. The information was also checked to ensure that HH identification numbers (IDs) were correctly assigned, all entries were complete, and there were no duplications. Data cleaning was also carried out to correct misplaced information or typos.<sup>10</sup>

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<sup>9</sup> For more details on data quality at endline, see Annex 4.

<sup>10</sup> For more details on data cleaning procedures, see Annex 5.

## 4. METHODOLOGY OF ANALYSIS

This report presents results for the indicators detailed in section 2.3., at two levels: (1) performance and (2) impact. The methods used to calculate results are described in this section.

### 4.1. PRIME INDICATORS CALCULATION

Midline and endline values were compared with baseline values, to evaluate project-wide and region-specific performance, by indicator. Statistical tests were also performed to determine whether changes seen over time were statistically significant at 95 percent confidence level. Significance was evaluated through p-values and confidence intervals. Table 1 lists the PRIME indicators, their definitions and corresponding baseline and target values.

**Table 1: PRIME Indicators, corresponding definitions and baseline and target values.**

Indicator	Definition	Baseline (2013) value	Target (2017) value
<b>Use of CAHW-provided animal health services</b>	Percentage of HHs using animal health services provided by CAHW	25%	33%
<b>Use of PVP-provided animal health services</b>	Percentage of HHs using animal health services provided by PVPs	9.0%	17.1%
<b>Dietary diversity PLW</b>	Average number of food groups consumed by PLW	2.02	5.00
<b>Dietary diversity children aged 6-to-23 months</b>	Percentage of children aged 6-to-23 months consuming at least four food groups	0.52%	7.00%
<b>Prevalence of hunger</b>	Percentage of HHs suffering from moderate or severe hunger	13%	19%
<b>Nominal Income<sup>11</sup></b>	Annual expenditure on food and non-food items	USD 1,589	USD 1,748 <sup>12</sup>

#### 4.1.1. PERCENTAGE OF HHS USING ANIMAL HEALTH SERVICES

This indicator is comprised of three parameters: 1) percentage of HHs using animal health services provided by a CAHW; 2) percentage of HHs using animal health services provided by a PVP; and 3) percentage of HHs using animal health services provided by either a PVP or a CAHW or, “general use.”

Following each survey, the total number of HHs reporting use of at least one of the animal health services was calculated, by providers. Dividing this sum by the total number of surveyed HHs resulted in the percentage of HHs using at least one or more of the animal health services. Note that although the M&E Plan describes this indicator as “access” to animal health services we more accurately describe it in this report as “HH use” of animal health services.

<sup>11</sup> Following Sec 2.3., the endline analysis includes real income (nominal income adjusted by inflation) to help understand changes in the prevalence of hunger.

<sup>12</sup> The original impact indicator for PRIME was to increase nominal income by 10 percent. The indicator was changed in Fiscal Year 3 to a reduction in the prevalence of poverty from 65 to 45 percent.

#### 4.1.2. DIETARY DIVERSITY IN PREGNANT AND LACTATING WOMEN (PLW)

This indicator measures the average the number of food groups consumed by all PLW in the 24 hours preceding the survey. Nine food groups were assessed: 1) grains, roots, tubers; 2) legumes and nuts; 3) dairy products (milk, yogurt, cheese); 4) meat; 5) eggs; 6) poultry, fish and seafood; 7) vitamin A-rich vegetables; 8) vitamin A-rich fruits; and 9) other fruits and vegetables.

It should be noted that during each survey, the number of HHs with a PLW varied: baseline, 339 HHs; midline, 322 HHs; endline, 334 HHs. The impact evaluation was not designed to assess this indicator. The sample size required to evaluate it needed to be larger and the evaluation period should have been shorter than every two years. However, due to project budgetary constraints the indicator was analyzed as part of these surveys and not in a specific study.

#### 4.1.3. DIETARY DIVERSITY OF CHILDREN AGED 6-TO-23 MONTHS

Among the relevant HHs, the percentage of children aged 6-to-23 months who consumed four or more food groups was calculated. For each child, the number of food groups consumed during the previous 24 hours was recorded for the following: 1) grains, roots, tubers; 2) legumes and nuts; 3) dairy products (milk, yogurt, cheese); 4) flesh foods (meat, fish, poultry and liver/organ meats); 5) eggs; 6) vitamin A-rich fruits and vegetables; and 7) other fruits and vegetables.

The number of HHs with children in this groups varied in each survey: baseline, 191 HHs; midline, 203 HHs; endline, 201 HHs. The impact evaluation was not designed to assess this indicator for the reasons described in section 4.1.2. Due to budgetary constraints it was included as part of this evaluation.

#### 4.1.4. NOMINAL AND REAL INCOME

At baseline and midline, a considerable portion of HHs reported zero income but expenditure higher than zero. For this reason HH expenditure was used as a proxy for estimating income,<sup>13</sup> and to facilitate understanding, this report uses the term, “income.” Income was calculated using two sets of HH information: food expenditure in the seven days prior to data collection day, and annual non-food expenditure (NFE) on durables and services. NFE data were collected by asking respondents for expenses incurred in the last 12 months for 16 items.<sup>14</sup>

Weekly food expenditure was converted to annual expenditure by multiplying it by 52.14 weeks. Annual food and NFE were then combined to calculate annual HH expenditure. This annual expenditure is the nominal income. Real income was calculated by adjusting the nominal income

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<sup>13</sup> Income estimated with expenditure data excludes savings from the calculation. However, it is still a more reliable variable than self-reported income.

<sup>14</sup> Items include: clothes, livestock and farm inputs, housing, transportation, health services, school fees and other education expenses, fuel, taxes, and more.

for inflation. Nominal income was converted into June 2011 prices.<sup>15</sup> For this conversion we used regional inflation rates.<sup>16</sup>

#### 4.1.5. PREVALENCE OF HHs WITH MODERATE OR SEVERE HUNGER

To determine the prevalence of moderate or severe hunger, the survey asked HHs if any member used hunger coping strategies in the four weeks prior to the survey. Specifically, the survey asked if any HH member:

- Limited portion size at mealtime
- Reduced the number of meals eaten in a day
- Skipped entire days without eating

For each event, five responses were possible:

- Never (value=0)
- Hardly at all/less than once a week (value=1)
- Once in a while/once or twice a week (value=1)
- Pretty often/3-6 times per week (value=2)
- Always/everyday (value=2)

Values for each question were added for each HH, providing a variable from zero to six. These values were further re-coded:

- Values between 0 and 1 = Little to no hunger
- Values between 2 and 3 = Moderate hunger
- Values between 4 and 6 = Severe hunger

The percentage of HHs experiencing moderate or severe hunger, out of the total HHs surveyed was then calculated.

In the midline and endline surveys, an increase in the prevalence of hunger was reported. However, in the midline report, it was hypothesized that some of the reported increase was due to respondents overestimating HH hunger to get further assistance. Therefore, to test this hypothesis during the endline survey, Kimetrica collected additional information to calculate *daily food expenditure per adult equivalent* and *daily kcal available per adult equivalent*.

#### 4.1.6. DAILY FOOD EXPENDITURE PER ADULT EQUIVALENT

For each survey, HHs were asked for their food expenditure in Ethiopian Birr (ETB) during the seven days prior to the survey. Food expenditure was recorded for 85 food items. These data were then converted into a daily expenditure per adult equivalent (after dividing by the number

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<sup>15</sup> In the midline report, the real income and poverty analysis set 2011 as the anchor year to convert nominal income into real income to match World Bank poverty lines (also at 2011 prices). June was selected because the baseline data was collected during June 2013. For this report, we have chosen the same period to build on previous analysis.

<sup>16</sup> For more details, see Annex 6.

of adult equivalents in the HH). This became the nominal daily food expenditure per adult equivalent.

Nominal daily food expenditure was then converted into June 2011 prices, or the daily food expenditure per adult equivalent in real terms. To facilitate understanding, we refer to “daily food expenditure per adult equivalent” in this report.

#### 4.1.7. DAILY KCAL AVAILABLE PER ADULT EQUIVALENT

This indicator describes the daily kcal *available* to HHs through purchase, assistance or harvest. It does not measure the daily kcal *intake*. HHs were asked to report the quantity of food purchased, harvested or received as gifts during the seven days prior to the survey, for each of 85 food items listed in the questionnaire. This information was recorded in one of 46 units of measurement. Some were internationally used, such as kilogram (kg), and others were local units, such as *medeb* or *kunna*. Each local unit has a different equivalence to kg, depending on the kebele and food item. During endline data collection, supervisors gathered equivalence rates from kebele offices. Food items purchased, harvested or received as gifts were then converted into kg of food.

Kimetrica also compiled a table of the kcal provided by every 100 grams of food consumed, disaggregated by food item.<sup>17</sup> This table listed 66 of the initial 85 food items. The remaining 19 were either not considered “food,” such as tobacco and chat, or were consumed by less than one percent of HHs. The quantity of food (kg) was then converted into kcal and expressed in daily terms per adult equivalent by dividing it by seven, and by the number of adult equivalents in the HH.<sup>18</sup>

## 4.2. PRIME IMPACT EVALUATION APPROACH

A detailed impact analysis of PRIME’s activities was performed in an effort to document potential reasons for each result at end-of-project. Data from the 932 HHs were used to estimate project impact using panel data analysis and a multivariate (MV) regression model. This type of model assesses the association between a set of independent variables and the variable of interest (e.g. nominal income).

One of the independent variables needs to measure the exposure to the project for the HHs. It is called the *exposure* variable, which Kimetrica then constructed as a representation of the number of activities implemented in the surveyed woredas at baseline, midline and endline. Information was obtained from *ki-projects*<sup>TM</sup> for all IRs, except IR4.<sup>19</sup> The number of activities across woredas ranged from 13 to 96. This exposure variable was then introduced into the MV regression analysis model (Table 2). The proportion of observable change attributed to PRIME

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<sup>17</sup> Kcal information for internationally-available food items was sourced from the United States Department of Agriculture. For local food items, kcal information was sourced from the Ethiopian Health and Nutrition Research Institute, 1998 Food Consumption Table.

<sup>18</sup> For more information, see Annex 7.

<sup>19</sup> IR4 activities are related to M&E and therefore not expected to affect the impact, outcome or output indicators.

is the coefficient  $\beta_1$ . The model was used to estimate project impact for the project as a whole and each region.

**Table 2: MV regression model using an exposure variable**

$Y_{it} = \alpha_1 + \beta_1 E_{it} + \gamma Z_{it} + \epsilon_{it}$	<b>Equation 2</b>
<b>Where:</b>	
<ul style="list-style-type: none"><li>• <math>Y_{it}</math> is the dependent variable</li><li>• <math>E_{it}</math> number of PRIME activities implemented in the woreda where HH <math>i</math> is located in period <math>t</math>. This is the exposure variable.</li><li>• <math>Z_{it}</math> is a set of independent variables</li><li>• <math>\epsilon_{it}</math> is the error term</li></ul>	

Dependent and independent variables are defined in Annex 8. The independent variables  $Z_{it}$  are: (1) implementation of PRIME; (2) gender of head of HH; (3) number of HH members; (4) number of HH members aged 15-64; (5) head of HH's number of years of education;<sup>20</sup> (6) presence of a HH member with a disability; (7) region where HH is located; (8) head of HH's primary occupation; (9) number of tropical livestock units (TLU); and (10) head of HH's marital status. In addition, Kimetrica constructed a variable measuring HH wealth.<sup>21</sup> Statistical significance of all independent variables was tested at 95 percent confidence level.

Each coefficient calculated from the MV regression analysis needs to be read assuming that everything else *remains constant*. To facilitate the reading of the report we have excluded this mention when presenting the estimates. For example, in Section 5 we say that “the implementation of PRIME is associated with a three percent increase in general use of animal health services”, instead of “the implementation of PRIME is associated with a three percent increase in general use of animal health services *assuming that all other variables remain constant*”.

Kimetrica also performed a difference in difference (DID) analysis. Due to sample size limitations, however, results were not statistically significant.<sup>22</sup>

It is also important to note that results in this report measure the change that is associated with the implementation of PRIME. They do not measure the impact attributed to PRIME. For this we would have needed to randomly assign HHs or woredas to a treatment and a control group but this type of evaluation could not be performed. The gold standard randomized controlled trial (RCT) methodology could not be undertaken because woredas chosen for PRIME intervention (i.e. where pastoralists are most affected by drought) could not be randomly selected.

<sup>20</sup> For years of education calculation, see Annex 9.

<sup>21</sup> For definition and details on formulas used, see Annex 10.

<sup>22</sup> Based on a complementary analysis, we would have needed more than 1,800 HHs to identify at least one of the DID results as statistically significant. For more details on sample size requirements, see Annex 11.

## 4.2.1. STANDARDIZATION OF VARIABLES

To facilitate comparison of variables expressed in different units, continuous variables were standardized (Table 3).<sup>23</sup>

Table 3: Standardization formula

$X_i = (x_i - x) / X_{sd}$
Where:
<ul style="list-style-type: none"><li>• <math>X_i</math> is the standardized value for variable X for HH <math>i</math></li><li>• <math>x_i</math> is the non-standardized value for variable X for HH <math>i</math></li><li>• <math>x</math> is the mean value for variable X</li><li>• <math>X_{sd}</math> is the standard deviation value for variable X</li></ul>

Therefore, their coefficients in the analysis are expressed in terms of changes in their standard deviation.<sup>24</sup> In this report, the terms below are best interpreted as follows:

- **Implementation of PRIME** – implementation of 31 activities of PRIME.
- **Larger HHs** – HHs with 2.55 more members.
- **HHs with greater number of working-age members** – HHs with 1.39 more members aged 15-64.
- **More educated head of HHs** – Heads of HH with 3.58 more years of education.

## 4.2.2. SET OF INDEPENDENT VARIABLES USED IN MV REGRESSION ANALYSIS

To address PRIME’s cross-cutting objectives, we included independent variables such as, “gender of head of HH” and “presence of a HH member with a disability.” We also added variables like, “head of HH’s number of years of education” and “number of HH members” which are factors that influence indicators. For example, infants in female-headed HHs might have higher dietary diversity than those in male-headed HHs. We evaluate these differences through additional research questions for all indicators listed in section 2.3.:

- Are there any differences between HHs headed by females and males?
- Are there any differences between HHs that have a member with a disability and HHs that do not?
- Are HHs more likely to use animal health services if the head of HH has more years of education?
- Is the diet of children aged 6-to-23 months more diverse in HHs headed by a woman?
- Do HHs led by a single head suffer more moderate or severe hunger than those headed by their married counterparts?

<sup>23</sup> For information on standardized variables and their parameters, see Annex 12.

<sup>24</sup> Coefficient results assume that all other variables remain constant. Changes in other variables may change the effect that is associated with PRIME.

## 5. MAIN FINDINGS

In this section, we explain the findings from the performance assessment and the impact evaluation based on MV regression analysis. Results for each indicator are presented for the entire PRIME Project area and each region.<sup>25</sup> The sample sizes used for calculating the indicators described in this section across PRIME and the regions are listed in Table 4. Dietary diversity indicators show sample sizes for the baseline, midline and endline surveys. Statistical significance of the changes over time was evaluated by looking at p-values and confidence intervals.

**Table 4: Household sample size for each indicator and region**

Indicator	PRIME	Afar	Oromiya	Somali
Use of animal health services (CAHW, PVP, general)	932	270	176	486
Dietary diversity of PLW	339, 322 and 334 <sup>26</sup>	76, 86 and 83	71, 61 and 62	192, 175 and 189
Dietary diversity of children aged 6-to-23 months	191, 203 and 201 <sup>27</sup>	46, 45 and 47	41,43 and 41	104, 115 and 113
Nominal and real income, daily food expenditure per capita and prevalence of hunger	932	270	176	486
Daily kcal available per adult equivalent	927	267	176	484

<sup>25</sup> For indicator performance, and the statistical significance of indicator changes for the Project and by region, see Annexes 13-16. For impact evaluation results on use of animal health services and the percentage of children consuming at least four food groups, see Annexes 17-20. For impact estimates on number of food groups consumed by PLW, children aged 6-to-23 months and nominal income, see Annexes 21-24.

<sup>26</sup> This indicator was not analyzed for a panel of HHs due to sample size limitations. There were only 101 HHs for performing this type of analysis.

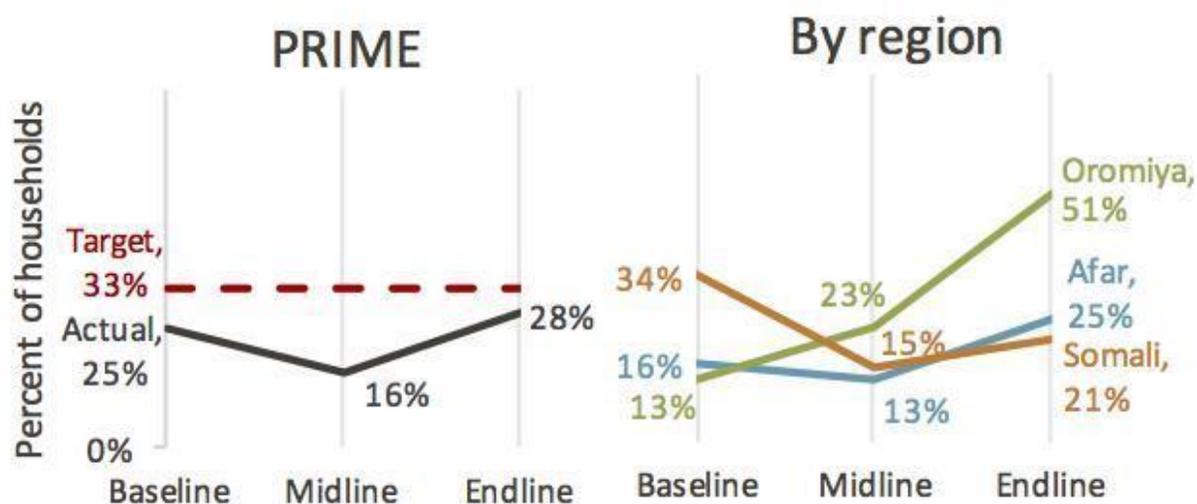
<sup>27</sup> This indicator was not analyzed for a panel of HHs due to sample size limitations. There were only 17 HHs for performing this type of analysis.

## 5.1. USE OF ANIMAL HEALTH SERVICES

### 5.1.1. USE OF ANIMAL HEALTH SERVICES PROVIDED BY CAHW

PRIME did not reach its end-of-project target of 33 percent of HHs using animal health services provided by CAHW, but it came close at 28 percent. Regionally, in Afar and Oromiya, use increased between baseline and endline to 25 and 51 percent of HHs, respectively. In Somali Region, while use decreased between baseline and midline and increased after, it still remained below baseline (Figure 4).

Figure 3: Percentage of HHs using CAHW-provided animal health services.



A November 2016 qualitative evaluation undertaken in Somali Region by Kimetrica may explain negative impact estimates. Respondents preferred CAHW, but noted they were not easily available in rural areas. This was despite PRIME having trained a large group of CAHW in 2014 in the region. It is possible that trainees decided not to provide services, or moved to other areas. A key informant said that it is also possible that CAHW stopped providing services as more PVPs were increasingly available, due to universities across the country now offering veterinary diplomas. It is also possible that they stopped due to availability of other alternative livelihood options like livestock trade. In any case, shortage of CAHW may be responsible for the seven percent reduction among Somali HHs using CAHW. In Oromiya Region, however, the implementation of PRIME<sup>28</sup> is associated with an 11 percent increase in HH use of CAHW. Results for Afar Region and the PRIME Project were not statistically significant.<sup>29</sup>

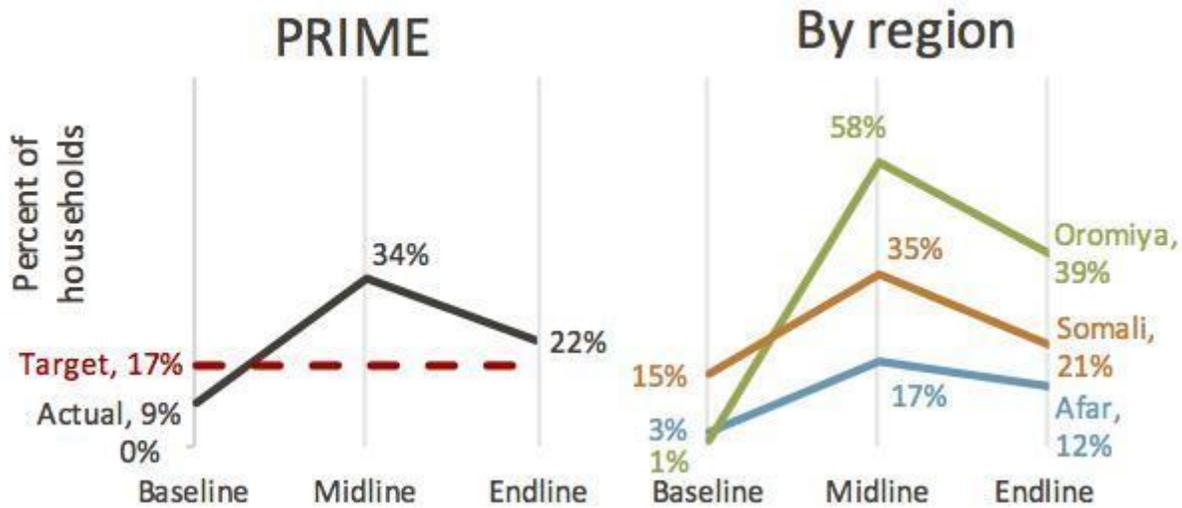
<sup>28</sup> Following Sec 4.2.1., “implementation of PRIME” should be interpreted as the implementation of 31 activities of PRIME. For more on variable standardization, see Annex 10.

<sup>29</sup> Following Sec 4.1, throughout this report, “statistically significant” means at 95 percent confidence level.

### 5.1.2. USE OF ANIMAL HEALTH SERVICES PROVIDED BY PVP

HH use of PVP-provided animal health services surpassed PRIME’s target of 17.1 percent, by five percent. In all regions, the largest increase was observed at midline. After, HH use remained stable<sup>30</sup> in Afar Region and dropped in Oromiya and Somali, remaining above the baseline for both (Figure 5).

Figure 4: Percentage of HHs using PVP-provided animal health services



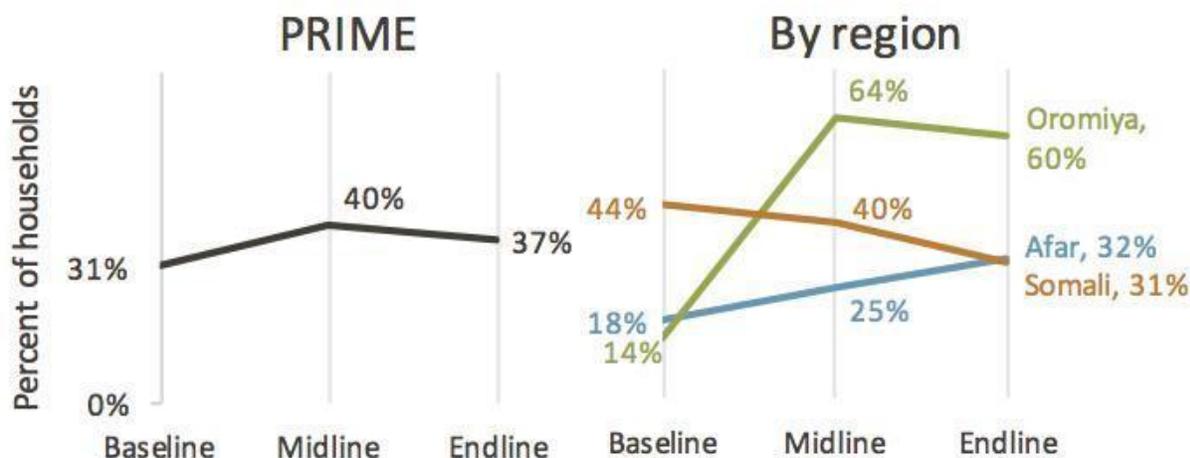
In terms of project-wide impact, the implementation of PRIME is associated with a five percent increase HHs using PVP. Regionally, Afar recorded a four percent increase in HH use and Oromiya, 12 percent. Results were not statistically significant for Somali Region.

### 5.1.3. GENERAL USE OF ANIMAL HEALTH SERVICES

General use of animal health services increased from 31 to 40 percent by the midline survey, and remained stable thereafter. There was no end-of-project target for this indicator. A similar trend was observed in Afar and Oromiya regions. In Somali Region, however, general use remained stable between baseline and midline and then dropped below baseline (Figure 6).

<sup>30</sup> Throughout this report, “remained stable,” means the change between two points in time is not statistically significant at 95 percent confidence.

Figure 5: Percentage of HHs using general animal health services



In terms of impact, the implementation of PRIME is associated with a three percent increase in HH general use of animal health services. By region, impact estimates vary, but fall in line with observed changes in the performance. They are highest for Oromiya (+15 percent) followed by Afar (+4 percent). Impact estimates were negative for Somali Region, as use decreased over time (-13 percentage points), especially for CAHW, as shown in Figure 4.

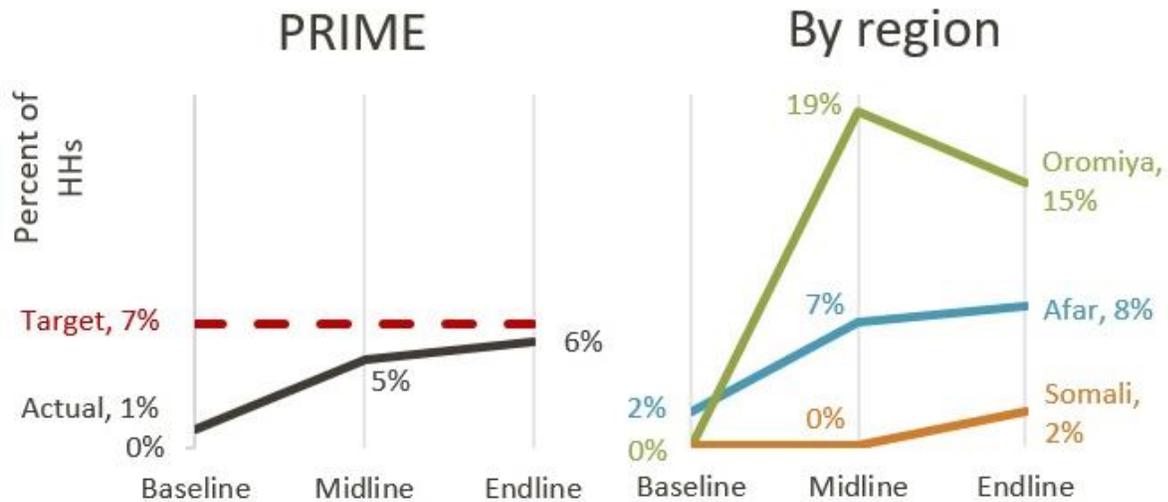
## 5.2. DIETARY DIVERSITY

Two indicators, dietary diversity of children aged 6-to-23 months and dietary diversity of PLW, were measured for HHs with at least one member of either. Since HHs with a PLW or age-appropriate child at the time of each survey were few in number, the sample size available for analysis was small. Therefore, it is possible that due to sample size limitations some results were not statistically significant. In addition, for these two indicators, a comparison of the *same* HHs over time would have resulted in analysis based only on 17 and 101 HHs, respectively (Table 4).

### 5.2.1. DIETARY DIVERSITY OF CHILDREN AGED 6-TO-23 MONTHS

The percentage of HHs with children aged 6-to-23 months consuming at least four food groups missed the end-of-project target by one percentage point. Child dietary diversity increased from one to five percent between baseline and midline, but remained stable thereafter at six percent. By region, child dietary diversity remained stable in Afar and Somali over time. However, it increased in Oromiya Region between baseline and midline and after, remained stable (Figure 7).

Figure 6: Percentage of HHs with a child aged 6-to-23 months consuming at least four food groups

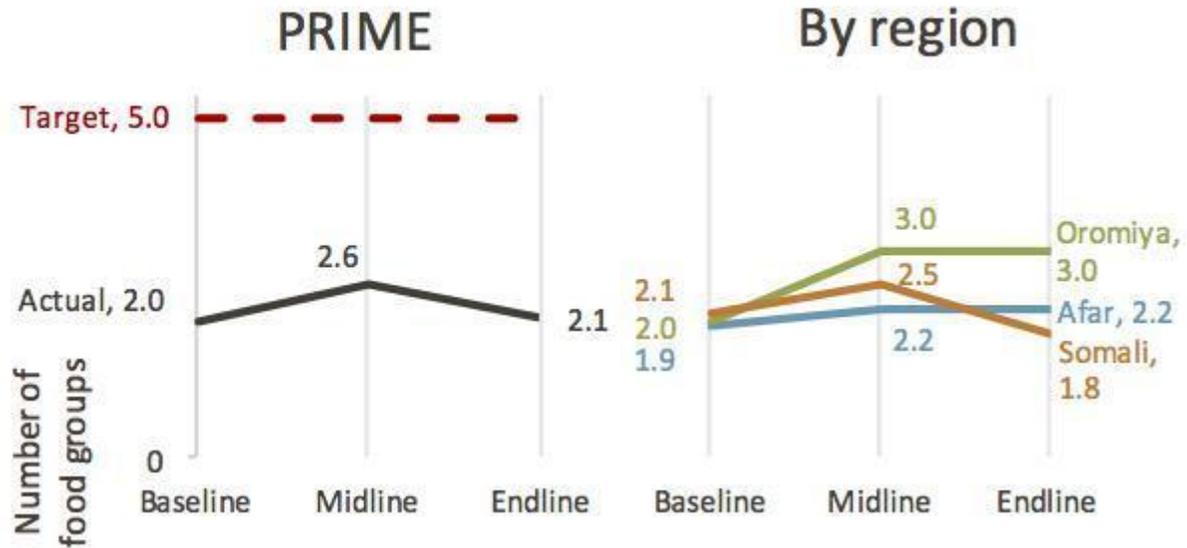


Impact evaluation results were not statistically significant for the PRIME Project nor the regions, regarding the percentage of children consuming at least four food groups. However, when assessing the increase in food groups, implementation of PRIME is associated with an increase equivalent to 0.24 food groups. Across regions, the implementation of PRIME is associated with an increase equivalent to 0.32 and 0.35 food groups in Afar and Oromiya, respectively. For Somali Region, impact evaluation results regarding the increase in food groups were not statistically significant.

### 5.2.2. DIETARY DIVERSITY OF PLW

For the whole project, the average number of food groups consumed by PLW missed the end-of-project target of five food groups. The number increased from 2.1 to 2.6 between baseline and midline, but thereafter returned to baseline. Regionally, dietary diversity of PLW between baseline and endline remained stable in Afar and Somali, but increased in Oromiya (Figure 8).

Figure 7: Average number of food groups consumed by PLW



Project-wide, impact evaluation estimates were not statistically significant. By region, the only impact evaluation result that was statistically significant is found in Afar, where the implementation of PRIME is associated with an average increase of 0.19 food groups.

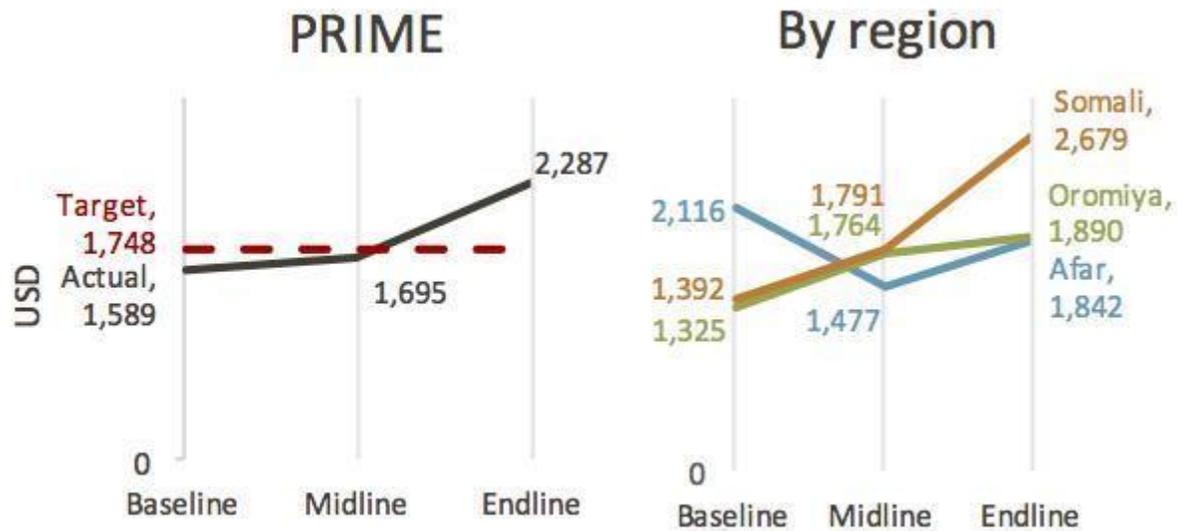
### 5.3. INCOME AND PREVALENCE OF HUNGER

All components and activities of PRIME ultimately aim to increase nominal income. Indeed, PRIME’s original objective, in addition to reducing the prevalence of hunger, was to increase nominal income by 10 percent. For this reason, Kimetrica also evaluated the performance of nominal income for this report.

#### 5.3.1. NOMINAL INCOME

Nominal income consistently increased from the inception of the PRIME Project. Overall, between the baseline and endline surveys, nominal income increased by 78 percent (equivalent of USD 2,287 per year), substantially more than the original target. The upward trend was similar in the regions, except Afar, which showed a marked dip at midline and a slight increase after (Figure 9). This was likely due to severe drought in the region in 2015-2016. We can also see that for Oromiya there is a change in the slope after midline. This was likely due to the drought that hit the region in 2015-2016.

Figure 8: Nominal annual income (USD)



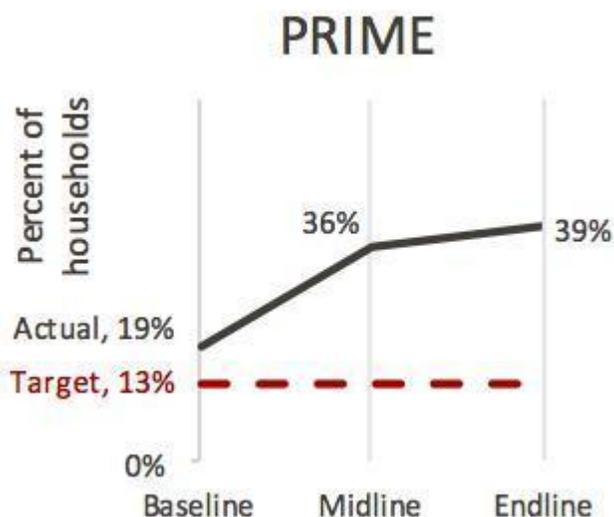
Impact evaluation estimates that the implementation of PRIME is linked to increasing nominal annual income by USD 223, greater than the result calculated for the midline report (USD 194). This shows that the PRIME Project had increasing impact on nominal income over time.

At the regional level, the implementation of PRIME is associated with higher nominal annual income in Somali (+USD 579) and Oromiya (+USD 133). Results were not statistically significant for Afar.

### 5.3.2. PREVALENCE OF HUNGER

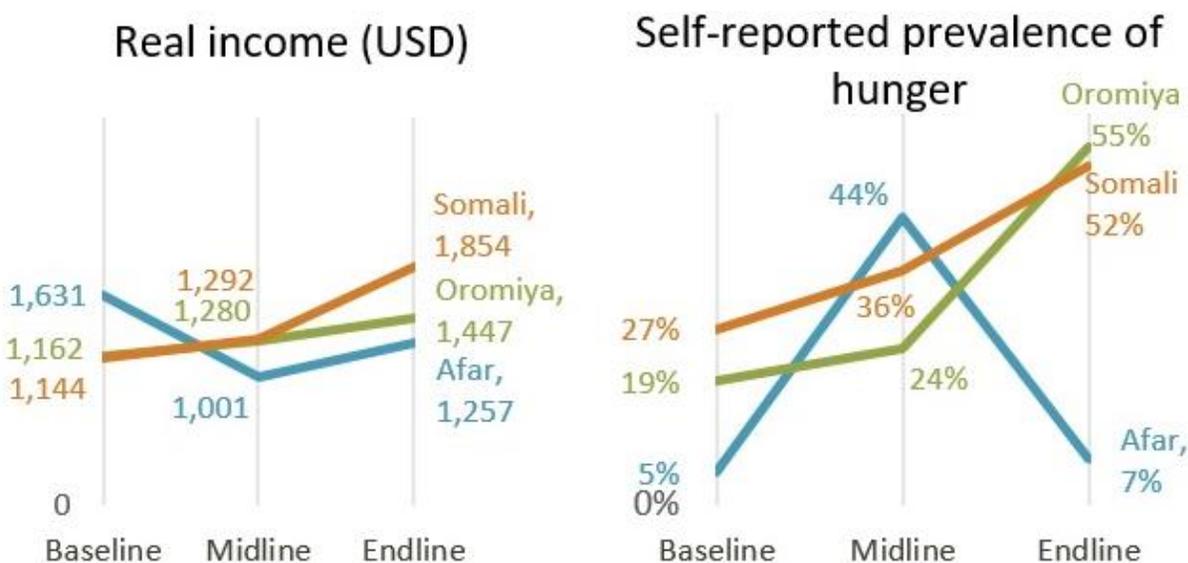
All PRIME activities ultimately aimed to decrease the prevalence of hunger from 19 to 13 percent by end-of-project. Prevalence of hunger, however, increased from 19 to 39 percent (Figure 10).

Figure 9: Prevalence of hunger in surveyed households in PRIME intervention areas.



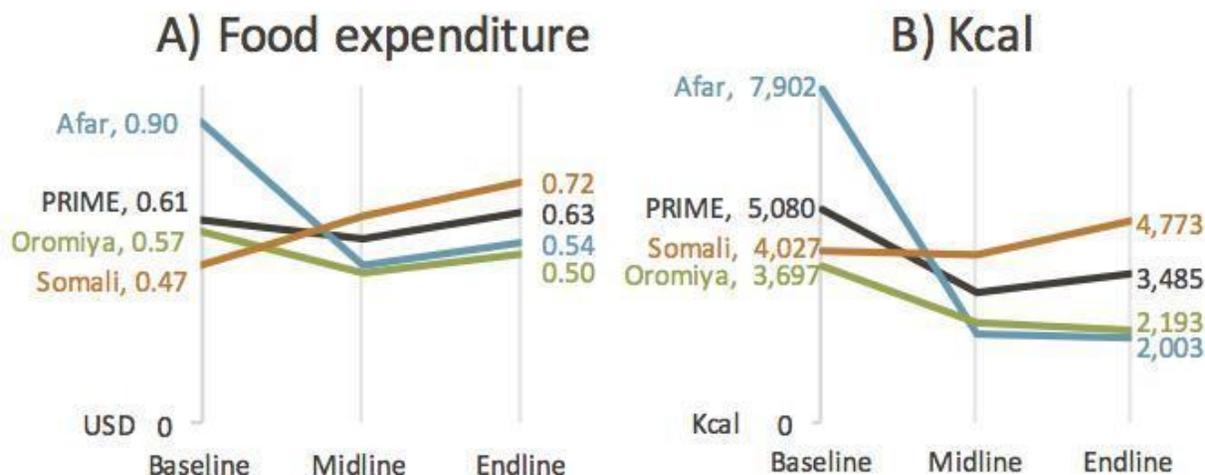
It is important to recall that this indicator uses self-reported data on hunger. Moreover, when looking at real income and self-reported hunger data at regional level there are inconsistent findings. In Oromiya and Somali, for example, the prevalence of hunger increased although real income also increased. In Afar, however, as real income rose after midline, hunger fell (Figure 11).

Figure 10: Real income and self-reported prevalence of hunger by region



Findings on daily food expenditure per adult equivalent and daily kcal available per adult equivalent by regions can help us to understand the reasons for the rise in the prevalence of hunger. At regional level, results vary (Figure 12).

Figure 11: Daily food expenditure per adult equivalent (A) and daily kcal available per adult equivalent (B).



In Afar Region, the prevalence of hunger increased by midline but thereafter returned to baseline levels. Accordingly, daily food expenditure per adult equivalent and the daily kcal available per adult equivalent declined 40 and 75 percent, respectively—confirming that the region has not recovered from the drought.

In Oromiya Region, real income increased over time, but so did the prevalence of self-reported hunger to 55 percent at endline. We believe this might be slightly over-estimated. The average daily food expenditure per adult equivalent dropped at midline, but then recovered to baseline level at USD 0.50, despite the 2015-2016 drought. The daily kcal available per adult equivalent did not recover, however, indicating there is some level of hunger.

In Somali Region, the prevalence of hunger almost doubled between baseline and endline. However, daily food expenditure increased over the same period, and the daily kcal available remained unchanged, reaching 4,773 at endline. Therefore, we believe that the prevalence of hunger in this region is overestimated. Self-reported hunger is highly prone to subjectivity bias.

Impact evaluation was not performed on the “prevalence of hunger” indicator due to the bias observed in the variable.

## 5.4. CROSS-CUTTING OBJECTIVES AND OTHER VARIABLES

This section presents results related to PRIME’s cross-cutting objectives—the inclusion of women and people with disabilities—and other independent variables included in the MV regression analysis.<sup>31</sup>

Project-wide, there were no observed differences between male and female-headed HHs nor between HHs that had a member with a disability and those that did not—except for use of CAHW. Male-headed HHs were nine percent more likely to use CAHW compared to their female counterparts.

By region, Somali results show that PLW in male-headed HHs consumed 0.34 less food groups than those in female-headed HHs. In addition, children aged 6-to-23 months in HHs with at least one member with a disability consumed 0.45 less food groups than those without. Among the former, it is possible that children’s diets receive less attention because the member with a disability requires extra assistance from others in the HH. There were no differences found in Afar and Oromiya.

Regarding the other independent variables, MV analysis estimates that HH size, the number of working-age members (aged 15-64) and the head of HH’s education and occupation are quite relevant for the indicators. Figures below are reported as averages and income, in annual terms.

### For PRIME:

- Larger HHs<sup>32</sup> had higher nominal income (+USD 251) and use of animal health services provided by PVP (+2 percent). HHs with a greater number of working-age members<sup>33</sup> had more nominal income (+ USD 134).
- As expected, PLW in HHs with a more educated head<sup>34</sup> had higher dietary diversity (+0.25 food groups), as did children aged 6-to-23 months (+.17 food groups).
- HHs whose head had a paid occupation recorded higher nominal income (+ USD 549) than those that did not. The former were seven percent less likely to use animal health services from PVP and nine percent less likely to do so from CAHW. This is probably because their main income source does not depend on livestock.

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<sup>31</sup> For further detail on these estimates, see Annexes 15-22.

<sup>32</sup> Following Sec 4.2.1., “larger HHs” should be interpreted as HHs with 2.55 more members. For more on variable standardization, see Annex 10.

<sup>33</sup> “HHs with greater number of working-age members” should be interpreted as HHs with 1.39 more members aged 15-64.

<sup>34</sup> “More educated heads of HH” should be interpreted as heads of HH with 3.58 more years of education.

## By region:

- Larger HHs in Afar and Somali had higher nominal income (+USD 205 and +USD 297, respectively). They were also five percent less likely in Afar to use animal health services from CAHW. In Oromiya, however, larger HHs were more likely to use CAHW (+7 percent) and PVP (+5 percent).
- HHs with a greater number of working-age members had higher nominal income in Oromiya (+USD 272) and Somali (+USD 99). In Afar, they used more CAHW (+4 percent).
- HHs with more educated heads are associated with higher nominal income in Afar (+USD 240), Oromiya (+USD 597) and Somali (+USD 146). In Oromiya, they are further associated with PLW and children consuming a greater number of food groups (+0.47 and +0.45 food groups, respectively). In Afar, they are linked to lower use of CAHW (-6 percent).
- HHs whose head had a paid occupation recorded higher nominal income in Afar and Somali (+USD 492 and +USD 628, respectively). They were less likely in Afar to use animal health services in general (-12 percent) or a PVP (-8 percent). In Oromiya, they were less likely to use PVP (-10 percent).

## 6. CONCLUSIONS AND RECOMMENDATIONS

Despite severe droughts in Ethiopia, in Afar Region in 2014 and in Somali Region in 2015, both of which ended in 2016, and 2015-2016 in Oromiya, this evaluation suggests that PRIME activities improved HH use of animal health services, nominal income and dietary diversity of children aged 6-to-23 months between 2013 and 2017. PRIME surpassed end-of-project targets for both use of PVP and nominal income (Table 6).

**Table 5: End-of-project targets and values**

Indicator	End-of-project target	Baseline value	Midline value	End-of-project value
Use of PVP-provided animal health services	17.1%	9%	34%	22%
Use of CAHW-provided animal health services	33%	25%	16%	28%
Percentage of children consuming at least four food groups	7%	1%	5%	6%
Average number of food groups consumed by PLW	5	2	3	2
Percentage of HHs suffering from moderate to severe hunger	13%	19%	36%	39%
Nominal Income	10% <sup>35</sup>	Not applicable	19%	78%

The decrease in the use of CAHW, particularly in Somali Region, has important implications for phase two of PRIME. A qualitative evaluation found that these HHs preferred CAHW. Few were available, however, despite PRIME having trained a large number in 2014. According to a key informant, it is possible that CAHW stopped providing services because of the presence of more PVP due to universities now offering veterinary diplomas or due to the availability of other alternative livelihood options like livestock trade. For phase two of PRIME, it will be important to collect qualitative information on CAHW availability in Afar and Oromiya to compare results with Somali Region. It will be relevant, too, to find 2014 CAHW trainees to understand why they stopped providing services. To control for trainees' personal decisions, for phase two of PRIME, we recommend identifying additional indicators to help measure progress on use of animal health services.

Small sample sizes weakened the analysis of dietary diversity values, potentially resulting in not statistically significant results. For example, only 201 HHs had an appropriately-aged child at endline; only 334 had a PLW. Going forward, we recommend increasing sample sizes to increase the power to find a statistically significant result. We also recommend performing a specific evaluation of these indicators within one or two years to assure rigorous comparison across HHs over time.

<sup>35</sup> The original M&E Plan for PRIME included the "increase in nominal income by 10% by end-of-project" as one of its impact indicators.

When looking at dietary diversity evolution across the regions, growth happened only between baseline and midline in Oromiya. To understand the factors preventing gains after midline, it will be important to complement our current findings with a qualitative evaluation in that region.

The endline report's most important results are income and hunger, both of which may be skewed by respondent bias. In this study, we used expenditure as a proxy for nominal income because it is less susceptible to respondent bias. As nominal income increased over time, excluding the expected decline in Afar during the drought, the prevalence of hunger essentially doubled over the same period from 19 to 39 percent in 2017. However, there are reasons to doubt the extent of this increase. In Somali Region, for example, while households reported that hunger almost doubled, results also show that real income and daily food expenditure grew over the same period. Moreover, the kcal available did not change. It is clear that self-reported prevalence of hunger in this region is overestimated. We recommend that future evaluations explore a range of hunger indicators, including consumption expenditures and kcal intake, and triangulate across these for steadier results.

### **The impact of PRIME: project-wide and in Oromiya, Somali and Afar**

The most significant impact of PRIME was on income. It is associated with increasing HH nominal annual income by USD 223—USD 29 higher than midline results. Across regions, PRIME had the largest impact in Somali.

In addition, PRIME helped to increase HH use of PVP services (+5 percent) and general use of animal health services (+3 percent). Among regions, PRIME had the largest impact in Oromiya Region regarding general use of animal health services, at 15 percent of HHs as compared to four percent in Afar Region. Results were negative for Somali but this could be due to data bias generated by CAHW shortage in the region.

PRIME achieved impact regarding dietary diversity of PLW in Afar, only. Its HHs showed a 0.19 gain in the average number of food groups consumed over time. For the dietary diversity of children aged 6-to-23 months, PRIME is associated with increasing the number of food groups consumed by 0.24. Higher results were found in Afar (+0.32 food groups) and Oromiya (+0.35 food groups). Results were not statistically significant for Somali Region.

Overall, PRIME yielded positive effects across regions. The difference on impact size across regions depends on HH characteristics as well the teams implementing activities in the field.

## ANNEX 1: LIST OF ACTIVITIES IMPLEMENTED IN 15 SURVEYED WOREDAS BETWEEN APRIL AND JUNE 2017

IR	Activity Name
IR-1	Facilitating Commercial Destocking in 10 Local Livestock Markets in Drought Stricken Areas of Siti Zone in ESRS and Zone 3 in Afar Regional State
IR-1	Livestock Fodder voucher interventions
IR-1	Exposure Visit for Livestock Traders
IR-1	Technical assistance to women groups on small scale shoat fattening
IR-1	Training on Meat Hygiene for Meat Traders
IR-1	Strategic Annual Livestock Vaccination and Treatment Program in 13 Woredas of ESRS
IR-1	Experience share visit for partners, milk traders and milk collectors on diary VC.
IR-1	B to B for Dairy Sub sectors
IR-1	Training on Business Skill Development and Feedlot Management for Feedlot operators and Livestock traders.
IR-1	Supporting zonal forum on local livestock marketing challenges & opportunities, New Legal framework to facilitate market linkages and creating conducive environment for livestock traders
IR-1	Discussion forum for Expansion of Ethiopian livestock trader Association at Zonal Level in Borena.
IR-1	Post drought livestock traders, feedlots and hotel owner forum
IR-1	Competitive for establishment of 5 fattening farm in Borena zones of SC PRIME intervention
IR-1	Business to business connection events between meat producer and consumers (feedlot, holding ground, butcheries, hotels and restaurants) with in Borena and Guji zone
IR-1	facilitate commercial destocking in 6 livestock markets through feed/fodder and transport cost share subsidy
IR-2	Training on Basic Data Collection and Dissemination Techniques for Kebele Early Warning Committee Members of Amibara, Gewane, Dulessa, Argoba, Awash Fentale, & Gela'alu Woredas
IR-2	Material Provision to Afar Regional DPFSPCO to Enhance Capacity for Information Sharing : Refresher training to enhance performance and relevance of Early Warning Systems for EWCs of Harshin District
IR-2	Build the capacity of Harshin District DPPOs for institutionalization of PSPs
IR-2	2016, Ganna, Participatory Scenario Planning to strengthen local adaptation planning and risk reduction through resilient livelihood strategies
IR-2	Strengthening EOC - Weather Information Centres through providing material & technical support within zonal and Woreda DRM Offices
IR-2	Support Bura dhera SAA group and Haya Guracha community member in Hay making
IR-3	Facilitating Cash Transfer and Financial Literacy Training for Drought Stricken Areas of Zone 3 in Afar Regional State
IR-3	Promoting Post-harvest grain storage technology Market Linkage
IR-3	Facilitating Technical & Marketing Skills training for Biomass Briquette Producers
IR-3	Financial market campaign to promote sharia compliance products in Eastern Cluster
IR-3	Capacity building for RUSACCOs Management Committee Members up-graded from VSLAs and RUSACCOs through training on Basic SACCO skills, Business Plan Development Skills, and By-laws Development.
IR-3	Financial Services: MFIs & Banks Strengthening, Expanding & Linking
IR-3	Insurance Development through awareness creation workshop on diversified insurance products focusing on agricultural Insurance for stakeholders.
IR-3	RuSACCO establishment via woreda CPO in Eastern Cluster

IR-3	Enhancing the capacity of PRIME staff through provision of TOTs on VSLA Field Agent (FA) and Private Service Providers (PSPs)
IR-3	Financial Inclusion for the People of Somali Region in Ethiopia (FIPSRE). An activity of Somali Micro Finance and Belcash Technologies
IR-3	Facilitation of Linkage between VSLAs and SMFI
IR-3	Poultry production and management training for Poultry farms in Filtu, Hudet, Dollo and Moyale somali
IR-3	Assessment of Potential areas for Poultry Production in five woredas in Somali region
IR-3	Post-harvest storage technology training for Government extension staffs and agro pastoralists Babile and Gursum Woredas
IR-3	Competitive Business Expansion Grant for Private Agricultural Input Suppliers
IR-3	Business skill And Entrepreneurship Development training for Private Service providers for Both Borana and Guji Zone
IR-3	Facilitating Conditional Cash Transfer and Financial Literacy training in areas affected by La Niña phenomena in Borena and Guji zone
IR-3	Supporting Post-Harvest Grain Storage Product Market Promotional Campaign
IR-3	Supporting La Nina affected Households in Accessing Irrigated Horticulture Seed through Restricted Voucher Scheme
IR-3	Zonal Agriculture Fair in Borena zone of Oromia region.
IR-3	Small Grant Support for Biomass Briquette Producers
IR-3	Capacity building for RuSACCOs through training on Basic SACCO skills and on Sharia complaints loan product procedures
IR-3	Facilitate for WCPO to upgrade graduated VSLA to RUSSACOS
IR-5	TEKEM Season II RLSG Leaders Refresher Training
IR-5	TEKEM Season II RLSG dialogue
IR-5	Food Preservation training for Agricultural, Health Extension workers and nutrition focal persons for better nutrition in Amibara, Awash, Gelea'lo and Gewane woredas of Afar Cluster
IR-5	Empowering women in HH decision making for better nutrition outcome event in Argoba and Dulessa woredas of Afar Cluster
IR-5	Training CHVs on the WASH intervention for better nutrition
IR-5	Nutrition Edutainment through Circus shows on 1000 days and dietary diversity at Fafem zone woredas.
IR-5	Support demand creation among pastoralist on the use of concentrated feed through community level dialogue with DAs
IR-5	Training on Feed Production and Conservation for Pastoralists to support milk production in order to enhance the nutritional Status of House Hold
IR-5	Communities Conversation events on the developed MIYCN music clip in Yabello,Dire,Moyale O and Miyo woreda of Borena zone
IR-5	school club members and teachers training on PRIME live theater performance in Liban, Gorodola and Wadera woreda
IR-5	Training on water hygiene & sanitation(WASH) for school teachers and club members for better nutrition outcomes in Liban, G/Edalo, Gorodola and Wadera woredas of Guji zone.
IR-5	Training on water hygiene & sanitation(WASH) for school teachers and club members for better nutrition outcomes in Yabello,Dire,Miyo and Moyale of Borena zone
IR-5	Second session Mirgitu radio drama launching workshop and refresher training for the radio listener group leaders in Guji zone
IR-5	second session Mirgitu radio drama launching workshop and refresher training for the radio listener group leaders in Borena zone

## ANNEX 2: AVERAGE NUMBER OF ACTIVITIES IN 15 SURVEYED AREAS AND IN ALL 46 WOREDAS, BY REGION AND , 2012-2017

Average number of activities in 15 surveyed woredas between 2012-2017					
Region/IR	IR1	IR2	IR3	IR5	PRIME
<b>Afar</b>	21.3	23.2	11.5	24.2	80.2
<b>Oromiya</b>	15.0	17.7	13.7	14.0	60.3
<b>Somali</b>	9.6	5.6	7.8	16.0	39.1
Average number of activities in all woredas between 2012-2017					
Region/IR	IR1	IR2	IR3	IR5	PRIME
<b>Afar</b>	19.8	20.8	10.7	22.0	73.3
<b>Oromiya</b>	8.6	12.5	6.9	9.2	37.3
<b>Somali</b>	8.4	6.3	4.9	13.4	33.0

Source: *ki-projects*<sup>TM</sup>

## ANNEX 3: SECTIONS INCLUDED IN THE ENDLINE QUESTIONNAIRE

The following 16 sections were included in the endline questionnaire applied during the 2017 survey:

1. Interview details- this section records the enumerator's ID, HH ID, location of the HH and name of the respondent, among others.
2. Household details- this section collects information on HH members such as name, gender, age, education level, occupation and disabilities.
3. Household characteristics- this section asks questions about the characteristics of the HH such as the materials of the walls, doors, toilets.
4. Household migration
5. Household assets
6. Livestock assets
7. Livestock commodities sold in the last 12 months
8. Household consumption and expenditure
9. Non-food expenditure on durables and services
10. Access to animal health services
11. Financial services: Access to Microfinance Institutions (MFI) & Banks
12. Financial services: Access to Rural Saving and Credit Cooperatives (RUSACO) & Voluntary Savings and Loan Associations (VSLA)
13. Shocks and recovery/ Shock impact score
14. Shocks and recovery/ recovery of HH assets after shock
15. Coping strategies
16. Women's dietary diversity
17. Children's dietary diversity

## ANNEX 4: DATA QUALITY ESTIMATES AT ENDLINE

Description	Afar	Oromiya	Somali	PRIME
Number of questions with consistent information	543	562	1037	2142
Number of questions with inconsistent information	27	8	46	81
Total number of questions	570	570	1083	2223
Consistency average out of 19 questions asked per respondent	18.1	18.7	18.2	18.4
Data quality in percentage- LQAS approach	95	95	95	95
Data quality in percentage- Conventional approach	95.3	98.6	96	96.6

## ANNEX 5: DATA CLEANING PROCEDURE

After data was collected and uploaded the dataset and labeling syntax file were downloaded from the Kobo server and the following changes were applied:

- Added GPS information for 15 HHs whose GPS data had to be taken with a different tablet at the beginning of the survey.
- Corrected HH IDs for some HHs whose IDs had been incorrectly assigned during data collection.
- A structural check was done to assure that all variables contained “valid” information. Valid information means that if a variable should take a value between 0 and 1, only this type of answers are included in the dataset. Kobo allows to set these rules to avoid data collection issues. It normally prompts a message saying that an incorrect value has been entered during data collection but this check was still performed.
- In Section 3, we included the names from the people who had migrated into the database. Originally the database only had the roster number for the person. Duplications of entries were also deleted.
- In section 4 we corrected some entry typos, for example the number of assets was reported at 400 beds instead of 4.
- In section 5 we corrected typos as done in section 4. For cases where the total amount received for the sale of livestock was clearly overestimated we used the average price received in the area times the number of animals sold by the HH to recalculate the total value of the sales.
- In section 6 we corrected outliers for unit prices of livestock commodities based on average information in the area where the HH was located.
- In section 8, expenses in “other items” had not been entered in the correct field. This was corrected.
- In section 9, the variable reporting the time it takes to access the animal health service provider was corrected to make sure the number of hours was matching the number of minutes. For example, 65 minutes is equivalent to 1 hour and 5 minutes.

## ANNEX 6: CUMULATIVE INFLATION RATES BY REGION AND SURVEY

Region/Survey	Baseline (June 2011-2013)	Midline (June 2011-Sept 2015)	Endline (June 2011 – May 2017)
<b>Afar</b>	43.53%	81.56%	100.29%
<b>Oromiya</b>	26.13%	69.55%	78.56%
<b>Somali</b>	34.62%	70.58%	97.53%

## ANNEX 7: KCAL PROVIDED PER EVERY 100 GR OF FOOD ITEM

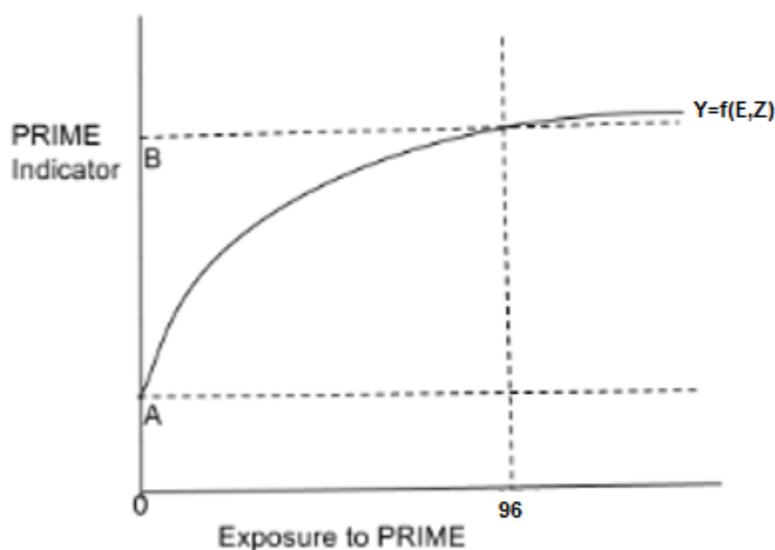
Food item	Kcal	Food item	Kcal
White Teff	227.95	Nueg	481.17
Black/mixed teff	224.71	Cabbage (Gomen)	32.58
Barley (Gebis)	242.15	Haricot Beans (Boloke)	155
Wheat (Durrah, Sinde)	239.96	Field Peas	42
Maize	251.23	Fenugreek (Abish)	272.2
Sorghum/Mashila	256.36	Beet root (Key sir)	43
Zengada	378	Carrot	34.9
Oats	389	Ginger (Jinjibel)	80
Horse Beans (Bakela)	31	Selatta (Lettuce)	15.4
Linseed (Telba)	439.23	Tiki Gommen	24

Groundnuts (Lewz)	673	Pumpkin (Duba)	33.75
Sesame (Selit)	527.83	Beef (Yekebit Segá)	318.16
Kundoberbere	251	Mutton (Yegeb Yefiyel Segá)	230.84
Lentils (Mesir)	246.85	Butter/ Cheese	748.4
Coffee	353	Milk/ Yoghourt	65.9
Bananas	87.8	Chicken	181.19
Sunflower	438.8	Eggs	205.48
Potatoes	143.64	Tella	7.9
Sugar cane	95.3	Birra (Bottled)	43
Pineapple (Ananas)	50	Soft drinks	42
Avocado	110.1	Sugar	380
Onions (Shinkurt)	180	Honey	360.5
Spinach (Quosta)	35.85	Salt	0
Nech Shinkurt	149	Cooking Oil/Edible oil	884
Yam	98.1	Karia	40
Kocho	166.29	Berbere	318
Chick Peas (Shimbra)	235.53	Bread (Dabo)	274
Cow Peas (Ater)	343	Maccaroni/Spaghetti	130
Orange	47	Turmeric (Ird)	312
Godere	118	Coffee Leaf/Tea/Ashara	139.75
Sweet Potatoes	203.28	Adengware	26
Tomato	63.07	Paddy rice	352
Guava (Vetch)	68	Shiro/Kollo	180

## ANNEX 8: PANEL DATA WITH EXPOSURE VARIABLE

It is possible to assess the value of Y with zero implementation or exposure (implying no PRIME activity) and at 96 implementation or exposure (maximum number of activities registered in the surveyed woredas as per *ki-projects*<sup>TM</sup>). In Figure 13 below, the difference between points B and A, on the indicator axis, refers to the change in the impact indicator that is broadly attributable to implementation to PRIME (E), while holding numerous external factors (Z) constant.

Figure 12: Regression approach analysis



The dependent variables considered in the regressions ran using the panel data with exposure variable approach were:

- A dichotomic variable that took value of one (1) in case the HH used animal health services provided by a PVP/ CAHW, and zero (0) otherwise
- Number of food groups consumed by PLW (Variable named PWDD).
- A dichotomic variable that took value of one (1) in case children under 23 months old had consumed at least 4 food groups, and zero (0) otherwise (Variable named CDD)
- Number of food groups consumed by children under 23 months old (Variable named CFGT).
- HH's nominal income.

For all dependent dichotomic variables we used a probit model. The results of this type of model can only be read when assuming a particular case. In this report we have used the average case (marginal probit) results, which is the standard practice for this type of model.

The independent variables included in the regressions are defined in the table below.

**Table 6: Definition of independent variables included in the regressions**

Variable	Definition
<b>Implementation of PRIME</b>	Measures the number of activities implemented in year <i>t</i> in the woreda where the HH is located.
<b>Gender of head of HH<sup>36</sup></b>	Dichotomic variable that takes value of one (1) if HH head is male, and zero (0) otherwise.
<b>Number of HH members</b>	Number of HH members in year <i>t</i> .
<b>Number of HH's members aged 15 to 64</b>	Number of HH members aged 15 to 64 in year <i>t</i> .
<b>Head of HH's number of years of education</b>	Measures the number of years of education that the HH head had in year <i>t</i> .
<b>Presence of a HH member with a disability</b>	Dichotomic variable that takes value of one (1) if the HH has in year <i>t</i> at least one member with a disability, and zero (0) otherwise.
<b>Region where HH is located</b>	This refers to two dichotomic variables: <ul style="list-style-type: none"> <li>• Afar variable that takes value of one (1) if the HH is located in Afar and zero (0) otherwise.</li> <li>• Oromiya variable that takes value of one (1) if the HH is located in Afar and zero (0) otherwise.</li> <li>• This means that the coefficient linked to each of these variables compares the result to the omitted region. In this case the omitted region is the Somali region.</li> </ul>
<b>Head of HH's primary occupation</b>	Dichotomic variable that takes value of one (1) if the head of HH has a paid primary occupation in year <i>t</i> , and zero (0) otherwise.
<b>Head of HH's marital status.</b>	Dichotomic variable that takes value of one (1) if the head of HH is married (monogamous or polygamous) or has a partner in year <i>t</i> , and zero (0) otherwise.
<b>HH wealth</b>	Measures HH wealth in year <i>t</i> .
<b>TLU<sup>37</sup></b>	Measures the number of TLU a HH owns in year <i>t</i> .

<sup>36</sup> Some households did not provide accurate information. At baseline 0.45 percent of HHs registered the wife as head of HH but when initially asked, they gave the husband's name. This information was corrected. At midline and at endline, 0.8 percent and 0.7 percent of HHs, respectively, did not assign a new head of HH given the original person was no longer living there, or was deceased. Information was cross-checked between the three datasets to assign the correct household head. When information was not provided, the oldest person (male or female) was marked as head.

<sup>37</sup> Tropical livestock units (TLU) is a way of measuring all livestock assets in a common unit. The measurement used in this report assumes: camel= 1.25 TLU; horses=1.1 TLU; Oxen= cow=1 TLU; bull= heifer=.75 TLU; donkey= mule=0.70 TLU; sheep=goat=0.13; poultry= 0.013 TLU.

## ANNEX 9: HH HEAD'S NUMBER OF YEARS OF EDUCATION

The variable measuring the head of HH number of years of education was constructed using information from the question asking about the maximum level of education completed for each HH member. Each educational level was converted into years of schooling using the following values:

- Zero years of schooling if the response was any of the following: never attended or attended an adult literacy program or some church/mosque education or other literacy program.
- 1 year if the highest level completed was to 1st grade.
- 2 years if the highest level completed was 2nd grade.
- 3 years if the highest level completed was 3rd grade.
- 4 years if the highest level completed was 4th grade.
- 5 years if the highest level completed was 5th grade.
- 6 years if the highest level completed was 6th grade.
- 7 years if the highest level completed was to 7th grade.
- 8 years if the highest level completed was 8th grade or incomplete higher education.
- 9 years if the highest level completed was to 9th grade.
- 10 years if the highest level completed was 10th grade or complete higher education.
- 11 years if the highest level completed was 11th grade.
- 12 years if the highest level completed was 12th grade.
- 14 years if the highest level completed was incomplete university.
- 16 years if the highest level completed was complete university.

## ANNEX 10: HH'S WEALTH

Kimetrica has calculated HH wealth based on HH possessions and their net savings. All income components have been excluded to be able to distinguish between wealth and income. The HH wealth was defined as:

**HH Wealth = Net Physical Assets + Net Livestock Value + Net Savings**

**Where:**

- Net Physical Assets = number of assets owned by HH \* current value
- Net Livestock Value = number of livestock sold \* current price
- Net Savings = total savings – total debt

For baseline and endline data, the questions used to calculate HH wealth were:

Variable	Baseline formula	Endline formula
<b>Net Physical Assets</b>	Q403*Q405	Q403*Q404
<b>Net Livestock Value</b>	Q605*Q610	Q601*Q602
<b>Net Savings</b>	Q2003 – (Q1903-Q1906)	Q1105-(Q1003-Q1005)

For midline data, the questions used to calculate HH wealth were:

- Net Physical Assets = Q403\*(woreda average asset price at baseline\*region inflation rate)
- Net Livestock Value = Q504
- Net Savings = Q1303+ Q1405 – (Q1303-Q1305)

In the midline questionnaire, there was no question asking for the current value of the assets owned by the HH. Therefore, Kimetrica estimated an average value for the different assets by woreda at baseline. Prices were then updated into 2015 prices using the inflation rate for the period between baseline and midline. Regional inflation rates were used to refine the calculations.

Questions 2003 at baseline, 1405 at midline and 1105 at endline were expressed in terms of expenditure (1 day of expenditure, 1 week of expenditure, 2 weeks of expenditure, 1 month of expenditure and more than a month of expenditure), hence the saving was calculated using HH expenditure for the corresponding time period.

In the cases where HHs declared to have savings equivalent to more than a month of expenditure (only five percent, four percent, three percent of HHs at baseline, midline and endline respectively), savings were replaced by the highest value of savings reported in the

sample if this was lower than the expenditure for that HH. If the highest saving in the sample was higher than the monthly expenditure for the HH then the total expenditure for the month was imputed as saving value.

## ANNEX 11: DIFFERENCE IN DIFFERENCES - SAMPLE SIZE

Kimetrica applied a DID approach as part of the impact evaluation analysis. In this approach the sample of HHs was divided into two groups depending on the intensity of activities deployed in the woreda where the HH was located. All results from this analysis were not statistically significant. Complementary analysis performed by Kimetrica shows that this is due to sample size limitations. The sample size needed to identify the results we got as statistically significant are shown in the table below.

**Table 7: Sample size required to find a statistically significant effect of the size estimated when running the DID analysis**

Indicator	Units	Change detected*	Sample size required
Dietary diversity PLW	Number of food groups	0.04	24600
Number of food groups consumed by children aged 6-to-23 months	Number of food groups	0.01	109000
Annual income (natural logarithm)	ETB	1	1840
Use of CAHW-provided animal health services	percentage	1.5%	26540
Use of PVP-provided animal health services	percentage	1%	24222
General use of animal health services	percentage	2%	14414
Dietary diversity children aged 6-to-23 months	percentage	1%	3630
<b>* In absolute terms</b>			
<b>** Total sample size, including high intensity and low intensity HHs.</b>			

## ANNEX 12: VARIABLES STANDARDIZATION

Independent variables were not measured in the same units (e.g. implementation of PRIME goes from 13 to 96 activities, HH wealth is in ETB, number of HH members is measured as number of people), therefore, it was necessary to standardized some variables. This has facilitated the comparison of results. Table 9 below shows the means and standard deviations of the variables standardized. It is important to note that dummy variables do not need to be standardized.

**Table 8: Parameters used for variables standardization**

Variable	Mean	SD
PRIME	29.53	30.90
HH size	5.99	2.55
HH Member 15-64 years	2.72	1.39
Head of HH Years of education	1.72	3.58
HH Wealth (ETB)	17,834.78	237,725.7

## ANNEX 13: INDICATORS PERFORMANCE - PRIME

Indicators for all PRIME ***											
Indicator	Description	Target	Baseline	Midline	Endline	Baseline vs Midline		Midline vs Endline		Baseline vs Endline	
						p-value	CI	p-value	CI	p-value	CI
<b>AAHS</b>	% of HHs using PVP or CAHW		31%	40%	37%	0	-.137629 -.0512122	0.1533	-.0119709 .0763485	0.0045	-0.1050862 -0.0193774
<b>CAHW</b>	% of HHs using CAHW	33%	25%	16%	28%	0	.051696 .1242697	0.0000	-0.1551166 -0.0809349	0.1401	-.0699339 .0098481
<b>PVP</b>	% of HHs using PVP	17.1%	9%	34%	22%	0.0000	-.2896262 -.2189575	0.0000	.0808739 .1616154	0.0000	-0.1651118 -0.1009826
<b>Hunger</b>	% of HHs suffering from moderate or severe hunger	13%	19%	36%	39%	0.0000	-.2093663 -.1296895	0.1516	-.0761573 .0117796	0.0000	-0.2419639 -0.1614695
<b>Annual Income</b>	Nominal income (ETB)		29,874	35,429	53,112	0.0000	-7514.91 -3595.742	0.0000	-20780.41 -14585.76	0.0000	-26376.09 -20100.74
<b>Real Income</b>	Real income (ETB June 2011)		21,895	20,478	27,248	0.0201	223.0443 2611.894	0.0000	-8382.594 -5157.27	0.0000	-7011.626 -3693.299
<b>CDD*</b>	% of HHs with a child aged 6 to 23 months old consuming at least 4 food groups	7%	0.52%	5.4%	6.0%	0.0047	-.0817326 -.0161706	0.8110	-.0507108 .0396822	0.0026	-0.0887825 -0.0201493
<b>PWDD**</b>	Number of food groups consumed by PLW	5	2	3	2	0.0000	-.7093712 -.3924995	0.0000	.3225593 .7007605	0.5956	-.1844935 .1059426
<b>Consumption per AE</b>	Food expenditure (ETB June 2011) per AE		10	9	11	0.0246	.1415065 2.066316	0.0040	-2.31132 -.4413207	0.5381	-1.140394 .5955749
<b>Kcal available per person****</b>	Daily Kcal purchased, harvested or received/ AE		5,080	3,106	3,485	0.0000	1261.359 2687.737	0.4822	-1439.025 679.9401	0.0102	378.6798 2811.332

\* Sample size= 191 HHs at baseline, 203 at midline and 201 at endline.

\*\* Sample size=339 HHS at baseline,322 at midline and 334 at endline

\*\*\* 932 HHs

\*\*\*\* 927

## ANNEX 14: INDICATORS PERFORMANCE - AFAR

Indicators for Afar (270 HHs)										
Indicator	Description	Baseline	Midline	Endline	Baseline vs Midline		Midline vs Endline		Baseline vs Endline	
					p-value	CI	p-value	CI	p-value	CI
<b>AAHS</b>	% of HHs using PVP or CAHW	18%	25%	32%	0.0472	-.139611 -.0011298	0.0862	-.1426214 .009288	0.0002	-.2091603 -.0649138
<b>CAHW</b>	% of HHs using CAHW	16%	13%	25%	0.394	-.0336484 .0855002	0.0005	-.1842824 -.0527547	0.0078	-.1603113 -.0248739
<b>PVP</b>	% of HHs using PVP	3%	17%	12%	0.0000	-.1939884 -.0949005	0.0678	-.0038744 .1149856	0.0001	-.1324257 -.0453521
<b>Hunger</b>	% of HHs suffering from moderate or severe hunger	5%	44%	7%	0.0000	-.4537458 -.324032	0.0000	.3078003 .4403479	0.4660	-.0546237 .0249941
<b>Annual Income</b>	Nominal income (ETB)	39,777	30,870	42,763	0.0000	5305.955 12508.65	0.0000	-17027.41 -6758.373	0.2553	-8141.593 2170.418
<b>Real Income</b>	Real income (ETB June 2011)	27,714	17,003	21,351	0.0000	8561.551 12860.35	0.0012	-6960.811 -1734.87	0.0000	3689.835 9036.382
<b>CDD*</b>	% of HHs with a child aged 6 to 23 months old consuming at least 4 food groups	2%	7%	9%	0.2959	-.1291155 .0392604	0.7388	-.1264937 .0896143	0.1755	-.1535891 .0268546
<b>PWDD**</b>	Number of food groups consumed by PLW	1.9	2.2	2.2	0.0798	-.6175718 .0349525	0.9665	-.3220552 .3086061	0.0212	-.5508873 -.0451812
<b>Consumption per AE</b>	Food expenditure (ETB June 2011) per AE	15	8	9	0.0000	5.756363 8.841504	0.0221	-2.331266 -.1820433	0.0000	4.519621 7.564937
<b>Kcal available per person****</b>	Daily Kcal purchased, harvested or received/ AE	7,902	2,076	2,003	0.0000	3788.996 7863.199	0.5554	-170.0379 315.6788	0.0000	3877.605 7920.231

\* Sample size= 46 HHs at baseline, 45 at midline and 47 at endline.  
 \*\* Sample size=76 HHS at baseline, 86 at midline and 83 at endline  
 \*\*\*\*267

## ANNEX 15: INDICATORS PERFORMANCE - OROMIYA

Indicators for Oromiya (176 HHs)										
Indicator	Description	Baseline	Midline	Endline	Baseline vs Midline		Midline vs Endline		Baseline vs Endline	
					p-value	CI	p-value	CI	p-value	CI
<b>AAHS</b>	% of HHs using PVP or CAHW	14%	64%	60%	0	-.5927835 -.4185802	0.3798	-.0558826 .1467916	0.0000	-.5486776 -.371777
<b>CAHW</b>	% of HHs using CAHW	13%	23%	51%	0.0181	-.1760436 -.0171382	0.0000	-.3804598 .187722	0.0000	-.4697513 -.2916123
<b>PVP</b>	% of HHs using PVP	1%	58%	39%	0.0000	-.6476323 -.5000949	0.0003	.0907451 .2956185	0.0000	-.4534697 -.3078939
<b>Hunger</b>	% of HHs suffering from moderate or severe hunger	19%	24%	55%	0.1952	-.1425788 .0289424	0.0000	-.4039227 .2097136	0.0000	-.4570423 -.2702304
<b>Annual Income</b>	Nominal income (ETB)	24,906	36,866	43,885	0.0000	-16475.08 -7446.526	0.0062	-12016.62 2021.187	0.0000	-23794.98 -14164.43
<b>Real Income</b>	Real income (ETB June 2011)	19,746	21,744	24,577	0.1487	-4715.922 720.5557	0.0531	-5705.271 37.93955	0.0008	-7625.916 -2036.782
<b>CDD*</b>	% of HHs with a child aged 6 to 23 months old consuming at least 4 food groups	0%	19%	15%	0.0037	-.3023585 -.0697345	0.6255	-.1191448 .1985549	0.0109	-.2545302 -.0381528
<b>PWDD**</b>	Number of food groups consumed by PLW	2	3	3	0.0000	-1.583437 -.7536673	0.0702	-.0447532 1.115615	0.0057	-1.2662
<b>Consumption per AE</b>	Food expenditure (ETB June 2011) per AE	10	8	9	0.0103	.4733678 3.482592	0.0272	-1.685931 -.1020075	0.1681	-.461741 2.629763
<b>Kcal available per person****</b>	Daily Kcal purchased, harvested or received/ AE	3,697	2,355	2,193	0.0005	599.3982 2084.306	0.1989	-85.90712 409.8667	0.0001	742.9831 2264.68

\* Sample size= 41HHs at baseline, 43 at midline and 41 at endline.  
 \*\* Sample size=71 HHS at baseline, 61 at midline and 62 at endline  
 \*\*\*\*176 HHs

## ANNEX 16: INDICATORS PERFORMANCE - SOMALI

Indicators for Somali (486 HHs)										
Indicator	Description	Baseline	Midline	Endline	Baseline vs Midline		Midline vs Endline		Baseline vs Endline	
					p-value	CI	p-value	CI	p-value	CI
<b>AAHS</b>	% of HHs using PVP or CAHW	44%	40%	31%	0.1933	-.0208021 .1031066	0.0074	.0223263 .1422828	0.0001	.0630338 .1838798
<b>CAHW</b>	% of HHs using CAHW	34%	15%	21%	0	.1367198 .241881	0.0186	-.1054593 -.009767	0	.0763795 .186995
<b>PVP</b>	% of HHs using PVP	15%	35%	21%	0.0000	-.2522559 -.146921	0.0000	.0758544 .1875201	0.0059	-.1160211 -.0197813
<b>Hunger</b>	% of HHs suffering from moderate or severe hunger	27%	36%	52%	0.0030	-.146555 -.0303997	0.0000	-.2200045 -.096868	0.0000	-.306329 -.1874981
<b>Annual Income</b>	Nominal income (ETB)	26,171	37,442	62,203	0.0000	-13769.76 -8771.127	0.0000	-29578.35 -19945.24	0.0000	-40722.37 -31342.1
<b>Real Income</b>	Real income (ETB June 2011)	19,441	21,950	31,491	0.0014	-4042.202 -975.4227	0.0000	-12051.29 -7030.749	0.0000	-14496.97 -9602.692
<b>CDD*</b>	% of HHs with a child aged 6 to 23 months old consuming at least 4 food groups	0.0%	0.0%	1.8%			0.1519	-.0420103 .0066121	0.1729	-.0420103 .0066121
<b>PWDD**</b>	Number of food groups consumed by PLW	2	3	2	0.0000	-.6639297 -.2873798	0.0000	.5161774 .9619179	0.0020	.0971239 .4296618
<b>Consumption per AE</b>	Food expenditure (ETB June 2011) per AE	8	11	12	0.0004	-4.10687 -1.201736	0.0576	-3.287532 .0525712	0.0000	-5.475979 -3.067588
<b>Kcal available per person****</b>	Daily Kcal purchased, harvested or received/ AE	4,027	3,947	4,773	0.8149	-590.4399 750.2423	0.4233	-2851.466 1199.452	0.4644	-2748.165 1255.954

\* Sample size= 104 HHs at baseline, 115 at midline and 113 at endline.  
 \*\* Sample size=192 HHS at baseline, 175 at midline and 189 at endline  
 \*\*\*484 HHs

## ANNEX 17: MARGINAL PROBIT ESTIMATES - PRIME

Variable	CAHW	PVP	AAHS	CDD
<b>PRIME</b>	.0146	.0489***	.0343***	.0059
	(.0081)	(.0082)	(.0095)	(.0064)
<b>Male head HH</b>	.0858***	.0236	.0751**	.0024
	(.0270)	(.0260)	(.0309)	(.0127)
<b>HH size</b>	.0213**	.0237**	.0327***	.0012
	(.0103)	(.0099)	(.0122)	(.0046)
<b># HH members 15-64</b>	-.0140	-.0055	-.0190	-.0029
	(.0099)	(.0095)	(.0117)	(.0055)
<b>Education head HH</b>	-.0137	-.0089	-.0267**	.0076
	(.0098)	(.0094)	(.0114)	(.0088)
<b>Disability</b>	-.0060	.0076	-.0062	.0065
	(.0234)	(.0224)	(.0276)	(.0100)
<b>HH wealth</b>	-.0337	-.0165	-.0480	-.0010
	(.0352)	(.0242)	(.0379)	(.0019)
<b>Afar</b>	-.0356	-.1835***	-.1405***	.0254
	(.0212)	(.0217)	(.0250)	(.0296)
<b>Oromiya</b>	.0717***	.0525**	.0862***	.0290
	(.0216)	(.0205)	(.0261)	(.0328)
<b>Occupation head HH</b>	-.0927***	-.0656***	-.1113***	-.0022
	(.0231)	(.0223)	(.0263)	(.0079)
<b>Married head HH</b>	-.0501	.0616**	.0222	.0077
	(.0282)	(.0285)	(.0329)	(.0194)
<b>TLU</b>	-.0006	.0011**	.0003	-.00008
	(.0005)	(.0004)	(.0005)	.0002
<b>Constant</b>	N.R	N.R	N.R	N.R
<b>Number of observations</b>	2926	2926	2926	2926
<b>Note: Standard errors in parenthesis. *** Statistically significant at 99%, ** statistically significant at 95%.</b>				
<b>NR: Not reported</b>				

## ANNEX 18: MARGINAL PROBIT ESTIMATES - AFAR

Variable	CAHW	PVP	AAHS	CDD
<b>PRIME</b>	.0181	.0363***	.0402***	.0037
	(.0116)	(.0103)	(.0136)	(.0084)
<b>Male head HH</b>	.0449	.0455	.0824	-.0044
	(.0477)	(.0393)	(.0548)	(.0122)
<b>HH size</b>	-.0477**	.0302	-.0058	-.0012
	(.0212)	(.0155)	(.0237)	(.0039)
<b># HH members 15-64</b>	.0396**	.0054	.0228	.0008
	(.0177)	(.0129)	(.0201)	(.0030)
<b>Education head HH</b>	-.0596***	-.0169	-.0625***	.0017
	(.0199)	(.0150)	(.0215)	(.0051)
<b>Disability</b>	-.0021	-.0228	-.0334	-.0006
	(.0390)	(.0296)	(.0452)	(.0047)
<b>HH wealth</b>	-.0466	-.0007	-.0267	.0061
	(.1205)	(.0444)	(.0889)	(.0141)
<b>Occupation head HH</b>	-.0696	-.0808***	-.1196***	-.0027
	(.0355)	(.0285)	(.0394)	(.0079)
<b>Married head HH</b>	-.0177	-.0493	-.0596	.0036
	(.0430)	(.0355)	(.0501)	(.0116)
<b>TLU</b>	-.0014**	-.0013**	-.0021***	-.00009
	(.0006)	(.0006)	(.0007)	(.0002)
<b>Constant</b>	N.R	N.R	N.R	N.R
<b>Number of observations</b>	824	824	824	143
<b>Note: Standard errors in parenthesis. *** Statistically significant at 99%, ** statistically significant at 95%.</b>				
<b>NR: Not reported</b>				

## ANNEX 19: MARGINAL PROBIT ESTIMATES - OROMIYA

Variable	CAHW	PVP	AAHS
<b>PRIME</b>	0.1106***	.1372***	.1475***
	(0.0147)	(.0122)	(.0118)
<b>Male head HH</b>	0.1211	.0319	.0741
	(.0797)	(.0711)	(.0717)
<b>HH size</b>	.0690**	.0522**	.0855***
	(.0275)	(.0252)	(.0260)
<b># HH members 15-64</b>	-.0508	-.0234	-.0592**
	(.0262)	(.02426)	(.0251)
<b>Education head HH</b>	-.0068	-.0146	-.0313
	(.0185)	(.0168)	(.0168)
<b>Disability</b>	.0564	.0430	.1003
	(.0527)	(.0477)	(.0516)
<b>HH wealth</b>	-.0308	-.0318	-.0423
	(.0370)	(.0328)	(.0335)
<b>Occupation head HH</b>	-.0783	-.0996**	-.0787
	(.0538)	(.0501)	(.0499)
<b>Married head HH</b>	-.0839	.0765	.0344
	(.0788)	(.0718)	(.0721)
<b>TLU</b>	.0025	.0023	.0046
	(.0017)	(.0016)	(.0017)
<b>Constant</b>	N.R	N.R	N.R
<b>Number of observations</b>	545	545	545
<b>Note: Standard errors in parenthesis. *** Statistically significant at 99%, ** statistically significant at 95%.</b>			
<b>NR: Not reported</b>			
<b>Convergence was not achieved when running the regression for the CDD variable.</b>			

## ANNEX 20: MARGINAL PROBIT ESTIMATES - SOMALI

Variable	CAHW	PVP	AAHS
<b>PRIME</b>	-0.0715***	-0.0231	-0.0952***
	(.0148)	(.0154)	(.0171)
<b>Male head HH</b>	.0902**	.0111	.0588
	(.0358)	(.0358)	(.0412)
<b>HH size</b>	.0218	-0.00009	.0114
	(.0133)	(.0139)	(.0162)
<b># HH members 15-64</b>	-0.0240	-0.0092	-0.0260
	(.0135)	(.0141)	(.0162)
<b>Education head HH</b>	.0148	.0130	.0177
	(.0155)	(.0159)	(.0187)
<b>Disability</b>	-0.0390	-0.0008	-0.0501
	(.0342)	(.0348)	(.0404)
<b>HH wealth</b>	-0.0337	-0.0104	-0.0589
	(.0675)	(.0222)	(.0761)
<b>Occupation head HH</b>	-0.0557	.0129	-0.0318
	(.0352)	(.0352)	(.0409)
<b>Married head HH</b>	-0.0866**	.1120**	.0345
	(.0411)	(.0442)	(.0487)
<b>TLU</b>	.0002	.0054	.0056
	(.0011)	(.0010)	(.0013)
<b>Constant</b>	N.R	N.R	N.R
<b>Number of observations</b>	1557	1557	1557
<b>Note: Standard errors in parenthesis. *** Statistically significant at 99%, ** statistically significant at 95%.</b>			
<b>NR: Not reported</b>			
<b>Convergence was not achieved when running the regression for the CDD variable.</b>			

## ANNEX 21: OLS ESTIMATES - PRIME

Variable	PWDD	CFGF	Nominal Income (ETB)
<b>PRIME</b>	.0551	.2434***	5179.63***
	(.0358)	(.0443)	(647.76)
<b>Male head HH</b>	-.0792	.0918	-1222.20
	(.1321)	(.1622)	(2156.37)
<b>HH size</b>	.0613	-.0585	5833.41***
	(.0442)	(.0612)	(873.39)
<b># HH members 15-64</b>	-.0492	.0097	3112.497***
	(.0486)	(0.0658)	(823.74)
<b>Education head HH</b>	.2449***	.1667***	8327.52***
	(.0396)	(.0512)	(784.69)
<b>Disability</b>	-.0327	-.1475	-249.36
	(.1112)	(.1402)	(1929.03)
<b>HH wealth</b>	.0930	.0353	4383.83***
	(.0700)	(.0686)	(619.00)
<b>Afar</b>	-.0613	-.1087	-13184.45***
	(.0931)	(.1259)	(1756.88)
<b>Oromiya</b>	.2869***	.4006***	-15571.59***
	(.0928)	(.1222)	(1904.91)
<b>Occupation head HH</b>	.0438	.0496	12751.43***
	(.0936)	(.1186)	(1817.63)
<b>Married head HH</b>	.3990	.2003	1912.52
	(.1782)	(.2234)	(2268.49)
<b>TLU</b>	.0014	.0034	123.73***
	(.0022)	(.0031)	(39.62)
<b>Constant</b>	1.8299***	1.1025***	41144.59***
	(.1538)	(.2000)	(1909.73)
<b>Number of observations</b>	1042	620	2926
<b>Note: Standard errors in parenthesis. *** Statistically significant at 99%, ** statistically significant at 95%.</b>			

## ANNEX 22: OLS ESTIMATES - AFAR

Variable	PWDD	CFGT	Nominal Income (ETB)
<b>PRIME</b>	.1915***	.3187***	387.14
	(.0575)	(.0753)	(851.01)
<b>Male head HH</b>	.2476	-.0480	-4667.75
	(.2338)	(.3101)	(3506.72)
<b>HH size</b>	-.0171	-.0877	4773.32***
	(.0913)	(.1351)	(1579.00)
<b># HH members 15-64</b>	-.1405	.0591	2486.83
	(.0801)	(.1169)	(1339.26)
<b>Education head HH</b>	.1430	.1796	5570.74***
	(.0799)	(.1156)	(1262.12)
<b>Disability</b>	.0374	-.3099	-3671.29
	(.1752)	(.2321)	(3016.7)
<b>HH wealth</b>	.9816	.4190**	60503.69***
	(.6324)	(.1736)	(4022.64)
<b>Occupation head HH</b>	-.0287	-.0937	11416.4***
	(.1487)	(.2049)	(2589.89)
<b>Married head HH</b>	.2185	.3645	4211.98
	(.2678)	(.3564)	(3260.92)
<b>TLU</b>	-.0017	-.0034	-3.35
	(.0024)	(.0039)	(39.70)
<b>Constant</b>	1.69***	1.12***	34846.45***
	(.2101)	(.3170)	(3042.65)
<b>Number of observations</b>	251	143	824
<b>Note: Standard errors in parenthesis. *** Statistically significant at 99%, ** statistically significant at 95%.</b>			

## ANNEX 23: OLS ESTIMATES - OROMIYA

Variable	PWDD	CFGT	Nominal Income (ETB)
<b>PRIME</b>	.1437	.3516***	3089.12***
	(.0866)	(.1014)	(1164.34)
<b>Male head HH</b>	.3755	.1340	-6353.73
	(.4323)	(.5721)	(5776.78)
<b>HH size</b>	.0250	-.1535	2112.34
	(.1378)	(.1870)	(2253.14)
<b># HH members 15-64</b>	.1067	-.1403	6317.04***
	(.1582)	(.2044)	(2096.1)
<b>Education head HH</b>	.4653***	.4497***	13868.87***
	(.0928)	(.1156)	(1482.39)
<b>Disability</b>	.2212	.6484	247.72
	(.3116)	(.3756)	(4176.66)
<b>HH wealth</b>	.1142	-.0985	6674.09***
	(.0988)	(.0954)	(2230.41)
<b>Occupation head HH</b>	-.1313	-.2151	5418.31
	(.2768)	(.3373)	(4125.21)
<b>Married head HH</b>	.1027	.1507	4495.51
	(.5328)	(.6357)	(5654.06)
<b>TLU</b>	-.0006	.0141	232.84
	(.0118)	(.0135)	(146.25)
<b>Constant</b>	1.90***	1.20	26323.9***
	(.4244)	(.4771)	(4116.44)
<b>Number of observations</b>	199	127	545
<b>Note: Standard errors in parenthesis. *** Statistically significant at 99%, ** statistically significant at 95%.</b>			

## ANNEX 24: OLS ESTIMATES - SOMALI

Variable	PWDD	CFGT	Nominal Income (ETB)
<b>PRIME</b>	-0.0358	.1195	13441.94 ***
	(.0552)	(.0643)	(1149.29)
<b>Male head HH</b>	-.3376**	.1397	347.10
	(.1585)	(.1742)	(2781.46)
<b>HH size</b>	.0773	-.0391	7101.62***
	(.0518)	(.0658)	(1086.07)
<b># HH members 15-64</b>	-.0734	.0932	2295.32**
	(.0634)	(.0840)	(1084.79)
<b>Education head HH</b>	.0866	-.0713	3387.46***
	(.0542)	(.0641)	(1276.32)
<b>Disability</b>	-.1429	-.4456**	2971.94
	(.1491)	.1794	(2695.01)
<b>HH wealth</b>	-.1415	.5703	3156.50***
	(.1562)	(.3281)	(650.85)
<b>Occupation head HH</b>	.1936	.2056	15003.38***
	(.1242)	(.1481)	(2748.92)
<b>Married head HH</b>	.5144**	-.0602	2112.68
	(.2595)	(.3094)	(3269.00)
<b>TLU</b>	.0098**	.0119**	421.23***
	(.0042)	(.0051)	(93.60)
<b>Constant</b>	1.81***	1.20	37690.37***
	(.2326)	(.2827)	(2570.57)
<b>Number of observations</b>	592	350	1557
<b>Note: Standard errors in parenthesis. *** Statistically significant at 99%, ** statistically significant at 95%.</b>			

