

# **“The Economic and Social Impacts of Electrification: Evidence from Kenya”<sup>1</sup>**

Pre-analysis plan

**AEA RCT Title:** “Evaluation of Mass Electricity Connections in Kenya”

**RCT ID:** AEARCTR-0000350

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**Summary:** This document outlines the plan for analyzing a dataset consisting of information on the living standards of roughly 4,000 households in Western Kenya, including nearly 500 households that previously benefited from a randomized household electrification program. The goal of this study is to estimate the economic and social impacts of household electricity connections. This document lays out the main regression specifications and outcome variable definitions that we intend to follow. However, we anticipate that we will carry out additional analyses beyond those included in this document. This document is therefore not meant to be comprehensive or to preclude additional analyses.

## **Appendix:**

- A. Living Standards Kenya (LSK) Survey – Baseline (2014)
- B. Living Standards Kenya (LSK) Survey – Follow-up (2016)
- C. Note on data management/access and pre-analysis plan (uploaded in May 2016)

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## 1. Introduction

### *1.1 Summary*

Universal access to modern energy has become a top priority for policymakers, nongovernmental organizations, and international donors across Sub-Saharan Africa. In Kenya, nearly \$600 million has been invested in extending the grid to rural areas since 2008. While there is now widespread grid coverage, the national household electrification rate remains relatively low. Kenya is currently pursuing a strategy of last-mile connections for “under grid” households in order to reach universal access to electricity by 2020. Given the high cost of subsidizing mass connections, however, there is a need for better understanding of the impacts of rural electrification. In this study, we will provide experimental evidence on the impacts of household electrification across a range of economic and social outcomes in Western Kenya. We will also examine the impacts of grid connections on neighboring households to better understand possible spillovers.

Between 2013 and 2015, we implemented a field experiment in which electricity connection vouchers (worth varying amounts) were randomly assigned to clusters of rural households in Western Kenya. Households accepting these vouchers were then connected to the national grid, in cooperation with Kenya’s Rural Electrification Authority (REA) and Kenya Power, the main electricity distribution company. As a result of this experiment, it is possible to perform a randomized evaluation of household grid connections. The study focuses on household survey data from baseline and follow-up surveys of 2,294 “main sample” households, as well as survey data from a follow-up survey of roughly 1,200 “secondary sample” households.<sup>2</sup>

### *1.2 Experimental design and steps*

In this section, we describe the experimental design. For further details, see Lee et al. (2016) at <http://dx.doi.org/10.1016/j.deveng.2015.12.001>, Lee, Miguel, and Wolfram (2016a) at <http://dx.doi.org/10.1257/aer.p20161097>, and Lee, Miguel, and Wolfram (2016b) at <http://www.nber.org/papers/w22292>.

Step 1: In July 2013, we collaborated with REA to identify a list of 150 rural “transformer communities” that would form a representative sample of communities recently connected to

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<sup>2</sup> The distinction between “main” and “secondary” sample households is described in Section 1.3.

the electrical grid in Busia and Siaya, two counties in Western Kenya. Each community is defined as all of the structures that were located within 600 meters of a central transformer.

Step 2: Between September 2013 and December 2013, we visited each community and geo-tagged over 13,000 structures, capturing the universe of unelectrified households that could potentially be connected to the national grid.

Step 3: Using these data as a sampling frame, we randomly sampled 2,504 households, consisting of 2,294 households that were unconnected at baseline and 205 households that were connected to the grid at baseline. The regressions described in Section 2.2 will focus on the group of 2,294 households. We use data from the sample of 210 connected households mainly for descriptive purposes, for example, to compare characteristics of households that had already connected without our subsidy to households that later connected with a subsidy. Between February and August 2014, we administered a detailed survey of each household, capturing baseline measures of living standards. See “Living Standards Kenya (LSK) Survey – Baseline (2014)” in Appendix A.

Step 4: In April 2014, we randomly assigned the 150 communities into four groups: (1) “High-subsidy” (or 100% discount) arm with 25 communities, resulting in an effective price of \$0; (2) “Medium-subsidy” (or 57% discount) arm with 25 communities, resulting in an effective price of \$171; (3) “Low-subsidy” (or 29% discount) arm with 25 communities, resulting in an effective price of \$284, and (4) “No subsidy” or control group (effective price of \$398 plus wiring) with 75 communities.

Step 5: After distributing the electricity connection subsidies, we facilitated the construction of grid infrastructure to connect the 478 unconnected households that accepted the randomized offer. The first household was metered in September 2014, the average connection time was seven months, and the final household was metered over a year later, in October 2015.

Step 6: In May 2016, we launched a follow-up survey round targeting all 2,504 households enrolled during the baseline round, in addition to roughly 1,500 newly enrolled households from the same transformer communities. This new sample of 1,500 households will consist of roughly 1,200 households unconnected at baseline (i.e., those that were observed to be unconnected at the time of the baseline census), and roughly 300 connected households. The

secondary sample regressions described in Section 2.4 will focus on the group of 1,200 households unconnected at baseline. As noted in Step 3, we use data on the roughly 300 connected households, along with data on the 210 connected households in the baseline sample, mainly for descriptive purposes. Currently, we are administering a detailed follow-up survey of each household, capturing various measures of living standards. See “Living Standards Kenya (LSK) Survey – Follow-up (2016)” in Appendix B. The follow-up survey round is expected to take place between May and October 2016.

### *1.3 Main and secondary samples*

To summarize, our study will focus on two sets of households. The first set of households—which we refer to throughout this document as “main sample” households—consists of the 2,289 households that were unconnected to electricity at the time of the baseline survey. These households were randomly sampled using the baseline census data and are thus representative of the under grid population at baseline. Out of these 2,289 unconnected households, 1,139 were provided with opportunities to connect to the grid at a subsidized price, and 478 eventually chose to connect to the national grid. We have both baseline and follow-up survey data for the main sample households.

The second set of households—which we refer to as “secondary sample” households—will consist of the roughly 1,200 households that were observed to be unconnected at the time of the baseline census, but were not enrolled into the data collection during the baseline survey. These households were also randomly sampled using the baseline census data and are thus representative of the under grid population at baseline. Data from the secondary sample will allow us to study the spillover impacts of household electrification.

### *1.4 Analysis and data examined to date*

At the time of registering this pre-analysis plan, we had collected follow-up survey information on over 3,500 households. Note that we did not perform any data analysis before registering this plan. As described in the document titled, “Note on data management/access and pre-analysis plan,” which was uploaded to the AEA RCT Registry on May 16, 2016 and is included in Appendix C of this document, the authors of this pre-analysis plan were provided with access to de-identified survey data for roughly 400 surveys, at the very beginning of the

survey round. These data were stripped of any indicators that could expose the treatment status of households, and were provided in order to (1) allow the authors to identify and correct any coding errors in the survey instrument, (2) make improvements to the choice sets for multiple-choice questions, (3) identify and amend questions that were taking too much time to administer, (4) address any other technical issues with the survey instrument (for instance, with the SurveyCTO software coding), and (5) make any final additions to the survey instrument to address minor questions that came up. Each member of the research team agreed to follow the data management/access plan.

As a result of these early data quality checks, we learned that there were missing observations for a small number of variables. In order to address this issue, project field staff will revisit certain transformer communities at the end of the survey round to collect missing data. The analyses described in Section 2 will utilize the complete set of data. In the appendix, however, we will present additional robustness checks in which we drop all data that were re-collected at the end of the survey round.

The remainder of this pre-analysis plan is organized as follows. Section 2 describes the main regression specifications, heterogeneity analysis, and planned methods of multiple hypothesis correction, in addition to other topics. Section 3 describes the major outcomes of interest. This document captures our current thinking about analysis with this data, but we anticipate carrying out some additional analyses beyond those included in this plan. As such, this plan is not meant to be an exhaustive set of all analyses we plan on carrying out, but rather a core set of initial estimates that will hopefully inspire further analyses.

## **2. Analysis**

### *2.1 General notes*

Randomly lowering the price of an electricity connection at the community-level by 29, 57, and 100 percent, resulted in increases in take-up of 6%, 22%, and 95%, over the baseline, respectively.<sup>3</sup> Take up in the low and medium subsidy treatment arms was relatively low. In our analysis, we will estimate both treatment-on-treated (TOT) and intention-to-treat (ITT) impacts of electrification. ITT estimates will be obtained from specifications in which various outcomes of interest are regressed on a set of binary variables indicating the treatment status of

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<sup>3</sup> See Lee, Miguel, and Wolfram (2016b) for details.

the community. TOT estimates will be obtained from two-stage least squares specifications in which the household’s electrification status, or the transformer community’s electrification rate, is instrumented with the set of treatment indicators.

Throughout this document, we refer to our subject population as “households.” In our setting, residential structures are typically located in compounds that can sometimes consist of multiple households. Our subject population consists of households that were considered to be the “main household” in the residential compound at the time of the baseline survey. To construct our sample, we randomly sampled compounds from each transformer community and enrolled the primary household in the compound. All other households in each compound are referred to as “minor households.”

In the majority of our main sample analyses, we will focus on the family of the respondent that was interviewed at baseline, regardless of whether the family is still living in the same location at the time of the follow-up survey. For certain outcomes, however, we will focus on the family (if any) that is currently living at the physical location where the baseline survey took place. This will allow us to examine an additional set of questions including, for example, whether locations that were electrified are more likely to remain inhabited, compared to locations that were not electrified.

## 2.2 Main sample impacts

We will first analyze the main sample and test the hypothesis that households connected to the electricity grid enjoy higher levels of living standards, and analyze effects on other economic and social outcomes. Using main sample data, we will estimate ITT results using the following equation:

$$y_{ic} = \beta_0 + \beta_1 T_{Lc} + \beta_2 T_{Mc} + \beta_3 T_{Hc} + X'_c \Lambda + Z'_{1ic} \Gamma + \epsilon_{ic} \quad (1)$$

where  $y_{ic}$  represents the outcome of interest for main sample household  $i$  in community  $c$ , and  $T_{Lc}$ ,  $T_{Mc}$ , and  $T_{Hc}$  are binary variables indicating whether community  $c$  was randomly assigned into the low-value, medium-value, and high-value subsidy treatment arms, respectively. Following Bruhn and McKenzie (2009), we include a vector of community-level characteristics,  $X_c$ , containing the variables used for stratification during randomization. In addition, we include  $Z_{1ic}$ , a vector of household-level characteristics. Further details on the

components of the covariate vectors are presented in Section 2.7. The variables in  $Z_{1ic}$  will sometimes be used in analyses of treatment effect heterogeneity, which is discussed in further detail in Section 2.8. In Section 2.10, we discuss the possibility of ANCOVA specifications for certain outcome variables. Standard errors will be clustered at the community level.

The issue of limited statistical power may be more severe in ITT specifications due to the relatively low take-up rates in the low and medium subsidy treatment groups. To address this issue, we will focus attention on the coefficient on the high subsidy treatment indicator. This test will not only shed light on the impacts of near universal electrification, but also is likely to have greater statistical power. The coefficients on the low and medium subsidy treatment indicators will also be of interest, since these will shed light on the average impacts of an electrification program with low take-up.<sup>4</sup>

We will also estimate TOT results using the following equations:

$$E_{ic} = \delta_0 + \delta_1 T_{Lc} + \delta_2 T_{Mc} + \delta_3 T_{Hc} + X'_c \Lambda_1 + Z'_{1ic} \Gamma_1 + \eta_{ic} \quad (2)$$

$$y_{ic} = \beta_0 + \beta_1 E_{ic} + X'_c \Lambda_2 + Z'_{1ic} \Gamma_2 + \epsilon_{ic} \quad (3)$$

where the first-stage equation 2 estimates the effects of the treatment indicators on household electrification status,  $E_{ic}$ , and the second-stage equation 3 estimates the effect of household electrification status on the various outcomes of interest. As in equation 1, errors will be clustered at the community level.

Lee, Miguel, and Wolfram (2016b) document systematic differences in the baseline living conditions of households taking up the experimental offers in the low and medium subsidy groups, compared to the high subsidy group. Households that paid more for an electricity connection (i.e., low subsidy arm households) were wealthier and more educated on average than those who paid nothing (i.e., high subsidy arm households). This suggests that the average treatment effect may vary across treatment arms. For example, electrification may be more impactful for the relatively wealthier households that are able to invest in complementary assets such as electrical appliances. In order to examine these types of heterogeneous treatment effects, we may explore the methods described in Kowalski (2016) to first recover bounds on average treatment effects for “always taker” and “never taker” households, and then decompose

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<sup>4</sup> Note that the effective price of an electricity connection in the medium subsidy arm is \$171 (or 15,000 KSh), which is the same price as that offered under the World Bank and African Development Bank-funded Kenya Last Mile Connectivity Project. These estimated effects are therefore likely to be of policy interest.

group average treated outcomes into selection and treatment effects. However, due to relatively low take-up rates in the low and medium subsidy groups, these analyses may be statistically underpowered.

Although the experiment generated exogenous variation in household electrification status, there remain some challenges in econometric identification. For example, if there are substantial local spillovers for unconnected or connected households, the stable unit treatment value assumption (SUTVA) may not hold. In this case, it is methodologically preferable to focus on the ITT results, and in particular, the coefficient on the high subsidy treatment indicator since it has a clearer interpretation. We describe our plan to quantify spillovers in the next section.

### *2.3 Community-level outcomes*

For community-level outcomes (which are specified in Section 3.12), we will estimate equations that are similar in form to those specified in Section 2.2, with the exception of two key differences. First, we will use both main and secondary sample data to construct the community-level outcomes of interest. Second, since the unit of observation is the community, we will exclude household-level covariates.

In the TOT specification to estimate community-level impacts, we will replace the  $E_{ic}$  term in equations 2 and 3 with  $R_c$ , the estimated local transformer community electrification rate, which itself is a major outcome of interest. Note that for each transformer community, we have data on the universe of households (as well as their grid connection status) at the time of our baseline census. In addition, we have follow-up household survey data for the main and secondary sample households. Since we do not have updated census data for each transformer community, we will need to estimate the current rate. For each of the three treatment arms, we will calculate the average take-up rate for the portion of secondary sample households that were observed to be unconnected at the time of the baseline census. We will estimate  $R_c$  by combining actual follow-up take-up data among the surveyed households with estimated take-up data for the non-surveyed households (i.e., those observed to be unconnected at the time of the baseline census) in the relevant treatment group. Specifically, for each treatment arm, we will assume that all of the remaining, non-surveyed households connected to the grid at the treatment arm-level average take-up rate. For the control group communities, we will also

include main sample households when calculating the control group take-up rate that will then be applied to the non-surveyed control group households. See Section 3.12 for additional details on how we plan to construct community-level outcome variables.

#### 2.4 Secondary sample impacts

We consider two types of potential spillovers. First, as shown in Bernard and Torero (2015), it is possible that an exogenous increase in the local electrification rate will encourage neighboring unconnected households to connect to the grid. In this case, we would expect to find higher electrification rates—as well as higher levels of willingness to pay for electricity—among secondary sample households in treatment communities, compared to control communities. We discuss our planned analysis of willingness to pay in Section 2.6. Second, it is possible that private grid connections result in economic and social impacts for neighboring households, for instance, if they sometimes use their neighbors’ power. In this case, we would expect to find improved living standards for secondary sample households located in treatment communities.

Using secondary sample data, we will estimate ITT results using the following equation:

$$y_{ic} = \beta_0 + \beta_1 T_{Lc} + \beta_2 T_{Mc} + \beta_3 T_{Hc} + X'_c \Lambda + Z'_{2ic} \Gamma + \epsilon_{ic} \quad (4)$$

where  $Z_{2ic}$  is the vector of household characteristics (see Section 2.7). We differentiate between  $Z_{1ic}$  and  $Z_{2ic}$  to account for a few covariates that are specific to either the main or secondary sample households. In order to concentrate attention on a coefficient with sufficient statistical power, we will again focus on the coefficient on the high subsidy treatment indicator,  $T_{Hc}$ . Recall that secondary sample households in the high subsidy treatment arm are likely to have a far higher number of recently connected neighbors.

We will also estimate TOT results for the secondary sample, but will take a slightly different analytical approach. First, we will estimate the equations:

$$R_c = \delta_0 + \delta_1 T_{Lc} + \delta_2 T_{Mc} + \delta_3 T_{Hc} + X'_c \Lambda_1 + Z'_{2ic} \Gamma_1 + \eta_{ic} \quad (5)$$

$$y_{ic} = \beta_0 + \beta_1 R_c + X'_c \Lambda_2 + Z'_{2ic} \Gamma_2 + \epsilon_{ic} \quad (6)$$

where  $R_c$  is the estimated local transformer community electrification rate (described in Section 2.3 above). The first-stage equation 5 estimates the effects of the treatment variables on the community electrification rate. The second-stage equation 6 estimates the effect of the community electrification rate on the household-level outcomes of interest. Second, we will estimate the set of equations:

$$R_c = \delta_{0,R} + \delta_{1,R}T_{LC} + \delta_{2,R}T_{Mc} + \delta_{3,R}T_{Hc} + \omega_{0,R}d_{ic} + \omega_{1,R}(T_{LC} \times d_{ic}) + \omega_{2,R}(T_{Mc} \times d_{ic}) + \omega_{3,R}(T_{Hc} \times d_{ic}) + X'_c\Lambda_R + Z'_{2ic}\Gamma_R + \eta_{ic,R} \quad (7)$$

$$r_{ic} = \delta_{0,r} + \delta_{1,r}T_{LC} + \delta_{2,r}T_{Mc} + \delta_{3,r}T_{Hc} + \omega_{0,r}d_{ic} + \omega_{1,r}(T_{LC} \times d_{ic}) + \omega_{2,r}(T_{Mc} \times d_{ic}) + \omega_{3,r}(T_{Hc} \times d_{ic}) + X'_c\Lambda_r + Z'_{2ic}\Gamma_r + \eta_{ic,r} \quad (8)$$

$$y_{ic} = \beta_0 + \beta_1R_c + \beta_2r_{ic} + \omega_{0,2}d_{ic} + X'_c\Lambda_2 + Z'_{2ic}\Gamma_2 + \epsilon_{ic} \quad (9)$$

where equations 7 and 8 are the first-stage equations and equation 9 is the second-stage equation.  $R_c$  is again defined as the estimated local transformer community electrification rate,  $r_{ic}$  represents the proportion of households within 200 meters of household  $i$  that are connected to electricity, and  $d_{ic}$  represents the proportion of households within 200 meters of household  $i$  that are in the main sample. We instrument  $r_{ic}$  with the treatment indicators,  $T_{LC}$ ,  $T_{Mc}$ , and  $T_{Hc}$ , as well as  $d_{ic}$  and the interactions between  $d_{ic}$  and the treatment indicators. The second-stage equation 9 therefore estimates the effects of the community electrification rate, as well as being in close proximity to connected households, on the outcome  $y_{ic}$ . Since there are multiple endogenous variables in this framework, equations (7), (8), and (9) will be estimated jointly.

The secondary sample analysis will allow us to determine whether there are any meaningful spillovers from household grid connections. This will in turn guide our interpretation of the main sample analysis in the ways noted above, especially in relation to the validity of the proposed instrumental variables approach. Note that it is challenging to precisely define the exact pattern of results that will allow us to conclude that the spillovers are “meaningful”. Broadly, if we estimate statistically significant spillover impacts on a number of key outcomes, then we will mainly focus on the main sample analysis ITT specifications rather than the TOT specifications in Section 2.2. Similarly, if we estimate statistically significant impacts on the connection rates of secondary sample households, the proposed instruments described in equations 5 through 9 would also violate the exclusion restriction and it may be preferable to focus on the ITT specification in equation 4.

## 2.5 Educational impacts

Another objective of this study is to understand the extent to which household electrification impacts the educational outcomes of schoolchildren. As part of the follow-up survey round, we administered short (roughly 15 minute) reading and math tests to all 12 to 15 year olds in our subject population. Using these data, we will estimate regressions that are similar in form to those specified in Sections 2.2 and 2.4 but will focus on individual children as the unit of observation. In these regressions, the covariate vectors  $Z_{1ic}$  (for the main sample) and  $Z_{2ic}$  (for the secondary sample) will be complemented with the covariate vector  $C_{jic}$ , which includes additional information on child  $j$  in household  $i$  in community  $c$ . The outcomes of interest in these specifications will therefore be denoted with the subscript  $jic$ . The covariate vector  $C_{jic}$  is described in more detail in Section 2.7.

## 2.6 Stated willingness to pay (WTP) for electricity

In the follow-up survey, we first ask respondents whether they would be hypothetically willing to connect to the national grid at a randomly selected price (i.e., *time unlimited* offer) (f3g in the follow-up survey). The randomly selected price,  $p$ , was drawn from the following set of prices (in Kenyan shillings):

$$\{0, 5000, 10000, 15000, 20000, 25000, 35000, 75000\}$$

This question was followed by an additional hypothetical question (f3h) asking the respondent whether they would accept an offer at this price if they were given only six weeks to complete the payment (i.e., *time limited* offer). Finally, respondents were asked whether they would be willing to pay a monthly amount over a period of three years, where the cumulative total is equal to the randomly selected price (f3i) (i.e., *financed offer*, with terms similar to those offered under the current Kenya LMCP). Respondents from connected households were asked a similar set of questions with somewhat different wording to reflect the fact that they are already connected (see f4g, f4h, and f4i).

We are interested in understanding how stated WTP responds to price levels. Specifically, we will estimate the following equation:

$$h_{ic} = \alpha_0 + \alpha_1 T_{LC} + \alpha_2 T_{Mc} + \alpha_3 T_{Hc} + \sum_p \beta_p W_{pic} + \sum_p \gamma_{1p} (W_{pic} \times T_{LC}) +$$

$$+ \sum_p \gamma_{2p}(W_{pic} \times T_{Mc}) + \sum_p \gamma_{3p}(W_{pic} \times T_{Hc}) + X'_c \Lambda + Z_{nic} \Gamma + \epsilon_{ic} \quad (10)$$

where  $h_{ic}$  is a binary variable indicating the stated (or hypothetical) take-up decision for household  $i$ ,  $W_{pi}$  is a binary variable indicating whether household  $i$  received the hypothetical price  $p$ , and  $Z_{nic}$  is the relevant household covariate vector. We are especially interested both in the direct effects of the treatment indicators, as well as the coefficients on the full set of interactions between the treatment indicators and the  $W_{pic}$  terms. These interactions will shed light on how stated WTP may be different for households that were recently connected to the grid (e.g., using the main sample data), or for unconnected households that recently observed neighboring households become connected to the grid (e.g., using the secondary sample data).

We will estimate separate regressions for the main sample and the secondary sample, since the interpretation of the results will be slightly different for each case. Standard errors will be clustered at the community level.<sup>5</sup> We will also test for heterogeneous effects, which are generally described in Section 2.8.

As in Lee, Miguel, and Wolfram (2016b), we will plot the stated WTP results graphically. For example, we may plot and compare demand curves for (1) time unlimited, time limited, and financed offers, (2) control households at baseline and at follow-up, (3) main sample households in the various subsidy arms and in the control group at follow-up, and (4) secondary sample households in the various subsidy arms and in the control group, as well as other leading comparisons.

### 2.7 Covariate vectors $X_c$ , $Z_{1ic}$ , $Z_{2ic}$ , and $C_{jic}$

In this section, we describe each of the sets of covariates that we plan to utilize in the analysis.

The vector  $X_c$  will primarily include the stratification variables that were used during randomization. These include:

- County: Binary variable indicating whether community  $c$  is in Busia county or Siaya county.

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<sup>5</sup> Based on the results of Lee, Miguel, and Wolfram (2016b), we do not expect the relationship between take-up and price to be linear. However, we may still test for linearity, and if we cannot reject linearity in an F-test, we will also estimate an equation in which  $y_{ic}$  is regressed on  $p_{ic}$ , controlling for the treatment indicators and other covariates.

- Market status: Binary variable indicating whether the total number of businesses in community  $c$  is strictly greater than the community-level mean across the entire sample. We use this definition to define which communities could be classified as “markets” relative to others.
- Transformer funding year: Binary variable indicating whether the electricity transformer in community  $c$  was funded “early” (i.e. in either 2008-09 or 2009-10).
- Electrification rate: Residential electrification rate in community  $c$  at the time of census (roughly 2013).
- Community population: Estimated number of people living in community  $c$  at the time of census (roughly 2013).

The vector  $Z_{1ic}$ , which will be included in regressions using the main sample data, will include the set of household-level variables listed below. Note that for the main sample households, we will be able to take advantage of the baseline survey data.

- Gender of respondent: Binary variable indicating whether the respondent is female.
- Age: Age of respondent in 2016.
- Education of respondent at baseline: Binary variable indicating whether the household respondent at baseline has completed secondary school.<sup>6</sup>
- Bank account at baseline: Binary variable indicating whether the household respondent at baseline had a bank account.
- Housing quality index at baseline: Index composed of whether the household had high-quality floors, roof, and walls at baseline.
- Asset value at baseline: Estimated value based on inventory of livestock, electrical appliances, and non-livestock assets at baseline, at current observed local prices.
- Energy spending at baseline: Estimated monthly expenditures on all energy sources at baseline.

The vector  $Z_{2ic}$ , which will be included in regressions using the secondary sample data, will include the household-level variables listed below. Note that there is no baseline survey data for this sample of households.

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<sup>6</sup> The respondent during the baseline survey is not necessarily the same person as the respondent during the follow-up survey.

- Gender of respondent: Binary variable indicating whether the respondent is female.
- Age: Age of respondent in 2016.
- Local density: Total number of households in the transformer community within 200 meters.<sup>7</sup>

The vector  $C_{jic}$  will include a set of individual-level characteristics that are relevant for the regression specifications estimating the impacts of electrification on educational performance.

- Gender of student: Binary variable indicating whether the student is female.
- Age: Age of student in 2016.
- Siblings: Number of children under 18 in the household.
- Grade attained at baseline (main sample only): Grade attained by the end of the 2013 academic year.<sup>8</sup>

## 2.8 Heterogeneous effects

In additional analyses, we will estimate heterogeneous treatment effects along a number of major dimensions, captured in the vectors  $X_C$ ,  $X_{1ic}$ ,  $X_{2ic}$ , and  $C_{jic}$ , by adding interaction terms between each treatment indicator and these variables. For instance, in order to assess how treatment impacts may vary for households at different wealth levels, we will estimate specifications in which the treatment indicators are interacted with the housing quality index at baseline.

Furthermore, there are a number of additional (and potentially endogenous) variables that are not included in the covariate vectors above but are of potential interest. These include:

- Transformer outages in the community: Proportion of months (between September 2014 and October 2015) that the transformer was not working.
- Connection days: Approximate number of days since the household was first connected to electricity.

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<sup>7</sup> In additional robustness checks, we will also carry out analysis using the total number of households in the transformer community within 400 meters.

<sup>8</sup> We will infer this data by comparing the baseline and follow-up surveys for main sample households. It is possible that this data will be missing for a large number of observations. In these instances, we may include an additional binary variable indicating that the data are missing. Alternatively, we may choose to drop this covariate altogether if this data are missing for over 30% of possible values from collected surveys.

- Relationships with main sample households (for secondary sample households):  
Number of main sample households whose members are considered to be extended family of the secondary sample respondent.

We are uncertain whether our study design will have sufficient statistical power to generate precise estimates on many of these interaction terms and hence such analyses should be considered suggestive rather than definitive. The patterns that emerge will also likely stimulate further exploratory analysis using the dataset.

### *2.9 Construction of indices*

When constructing indices, we will normalize each component variable to have mean zero and unit variance, thereafter constructing the index by summing each component variable (the mean effects approach). Note that we will exclude any variables with zero variance since these do not contribute any information to the analysis. Furthermore, if a pre-specified variable is missing more than 30% of possible values from collected follow-up surveys, we will drop it from inclusion in the index. We cannot anticipate why a particular variable will be missing so frequently, but in such events where it warrants exclusion, we shall explore these reasons in the analysis. Finally, we will report all individual outcomes used to create indices in the appendix.

### *2.10 Multiple Testing Adjustment*

In Section 3, we describe how the major outcomes of interest are categorized into ten broad “families”. For the main coefficient estimates of interest (for instance,  $\beta_1$ ,  $\beta_2$ , and  $\beta_3$  in equation 1) we will present two sets of p-values. First, we will present the standard “per-comparison”, or naïve, p-value, which is appropriate for a researcher with an a priori interest in a specific outcome. For instance, researchers interested in the effect of household electrification on non-agricultural compensation should focus directly on this p-value.

Second, since we test multiple hypotheses, it is also appropriate to control for the possibility that some true null hypotheses will be falsely rejected. Therefore, we will also present the false discovery rate (FDR)-adjusted q-value that limits the expected proportion of rejections within a hypothesis that are Type I errors (i.e., false positives). Thus, while a p-value is the unconditional probability of a Type I error, the analogous FDR q-value is the minimum proportion of false rejections within a family that one would need to tolerate in order to reject

the null hypothesis.<sup>9</sup> Specifically, we will follow the approach to FDR analysis adopted in Casey et al. (2012) and the references cited therein (e.g., Anderson 2008).

### *2.11 Additional analyses*

For a subset of outcomes in the main sample regressions, we will have both baseline and follow-up observations (e.g., household size, home solar system usage, energy consumption, etc.). In this case, we will also estimate ANCOVA regression specifications in which the baseline value of the outcome of interest is included as an additional covariate, as the resulting estimates may have greater statistical power (McKenzie 2012). However, note that we lack equivalent baseline measures for many outcome variables described below (in Section 3). This is particularly the case when the household respondent in the follow-up survey is not the same person as the household respondent in the baseline survey. As a result, the ANCOVA estimates will be presented mostly as a supplement. Our main focus will be on the results of the specifications described in Sections 2.2 and 2.4 above.

## **3. Major outcomes of interest**

### *3.1 Overview*

In this section, we specify 77 major economic and social outcomes of interest. These outcomes have been selected based on the judgment of the research team and are arranged into ten broad families: (1) energy consumption, (2) household structure, (3) time use, (4) productivity, (5) wealth, (6) consumption, (7) health and wellbeing, (8) education, (9) social and political attitudes, and (10) community outcomes. Based on this list, we also identify a group of ten “primary” outcomes, drawn from a number of different outcome families. The estimated impacts on these primary outcomes will serve as an overall summary of the impacts of household electrification in our setting. As discussed in Section 2.10, we will present FDR-adjusted q-values for each of the outcomes within the primary outcomes group, as well as FDR-adjusted q-values for each outcome within each of the ten outcome families. As noted in Section 1.4, we anticipate that we will examine additional outcomes beyond those included in this plan.

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<sup>9</sup> In this sense, false positives are driven not only by sampling variation for a single variable (the traditional interpretation of a p-value) but also by having multiple outcomes to test.

Within each outcome family, there are outcomes at different levels of aggregation, ranging from specific variables to indices that combine data from multiple variables. Due to the novelty of many of these measures, some of the groupings are speculative. We will therefore report measures of index quality and coherence in the appendix, for example, by examining the correlation patterns of measures within each index. Depending on the index quality, we may also perform additional analyses, for example, presenting results with alternative groupings of outcomes. For completeness and transparency, in the appendix, we will also present estimated impacts for all specific outcomes individually, including those used to construct each of the indices.

### 3.2 Primary outcomes

Table 1 summarizes the ten primary outcomes that will serve as an overall summary of living standards in our setting.

Table 1. Primary outcomes

ID	Outcome	Unit	Type	Description	Ref.
P.1	Grid connected	HH	Indicator	Indicator for main household connection	1.1
P.2	Grid electricity spending	HH	Total	Estimated prepaid top-up last month or amount of last postpaid bill	1.7
P.3	Employed or own business - Household	HH	Proportion	Proportion of household members (18 and over) currently employed or running their own business	4.5
P.4	Total hours worked	Resp.	Total	Total hours worked in agriculture, self-employment, employment, and household chores in last 7 days	4.11
P.5	Total asset value	HH	Estimated value	Estimated value of savings, livestock, electrical appliances, and other assets	5.6
P.6	Annual consumption	HH	Value	Estimated value of annual consumption of 23 goods	6.2
P.7	Recent symptoms index	Resp.	Index	Index of symptoms experienced by the respondent over the past 4 weeks	7.3
P.8	Life satisfaction	Resp.	Scale	Life satisfaction based on a scale of 1 to 10	7.8
P.9	Average test score	Child	Z-score	Average of English reading test result and Math test result	8.3
P.10	Political and social awareness index	Resp.	Index	Index capturing the extent to which the respondent correctly answered a series of questions about current events	9.4

For certain primary outcomes, we are able to use the existing literature to guide our expectations on the impacts of electrification in our setting. For example, in South Africa,

Dinkelman (2011) finds that female employment rises by 9 to 9.5 percentage points and women work roughly 8.9 hours more per week. In Brazil, Lipscomb, Mobarak, and Barham (2013) find that the probability of employment increases by 17 to 18 percentage points, over the long run, in counties that are electrified. Taken together, we should expect to find substantial increases in the probability of employment (P.3) and labor hours (P.4), particularly for women. Furthermore, in the Philippines, Chakravorty, Emerick, and Ravago (2016) estimate that village-level electrification leads to an increase in household expenditures by 38 percent, suggesting that there will be large gains in household consumption (P.6). In terms of test scores (P.9), Hassan and Lucchino (2016) examine the impacts of randomly distributing solar lanterns to 7<sup>th</sup> grade pupils in Kenya and find math grades to increase by 0.88 standard deviations for treatment pupils. In our analysis of each primary outcome, we will test the null hypothesis and (wherever possible) the hypothesis that the treatment effect is the same as that found in the existing literature. Finally, we will compare the estimated impacts in our study to other outcomes in the broader development economics literature in order to assess the cost effectiveness of rural electrification as a development policy.

### 3.3 Family #1 – Energy consumption major outcomes

At the most basic level, electricity connections should impact the way in which households consume energy. Family 1 includes the major outcomes relating to access to and usage of different forms of energy.

Table 2. Energy consumption major outcomes

ID	Outcome	Unit	Type	Component(s)	Survey data
1.1	Grid connected	HH	Indicator	Indicator for main household connection	F1a
1.2	Electric lighting	HH	Indicator	Indicator for electricity as main source of lighting	F1b
1.3	Lighting usage	HH	Total	Hours of lighting used (past 24 hours)	F18
1.4	Installation	HH	Total	Number of electrical outlets available	F6b
				Number of lighting sockets available	F6c
				Number of power strips in use	F6e
1.5	Appliances owned	HH	Total	Number of “high-wattage” appliances owned <sup>10</sup>	F19a to F19c
1.6	Appliances desired	HH	Total	Number of “high-wattage” appliances desired	F19d to F19g

<sup>10</sup> In general, we follow Lee, Miguel, and Wolfram (2016a) in the definition of high and low wattage appliances. For instance, there we define mobile phones and radios as “low-wattage” appliances.

1.7	Grid electricity spending	HH	Total	Estimated prepaid top-up last month Amount of last postpaid bill	F7a to F7e, F5h F8a to F8c, F5h
1.8	Kerosene spending	HH	Total	Kerosene spending last month <sup>11</sup>	F11
1.9	Other energy sources spending <sup>12</sup>	HH	Total	Solar power spending last month Battery spending last month Generator spending last month Purchased firewood spending last month Charcoal spending last month LPG spending last month Sawdust spending last month Mobile phone charging last month Other spending last month	F13d, F14d F15b, F15c F16c F17a F17b F17c F17d F17h F17e to F17g, F17i
1.10	Total energy spending	HH	Total	Total spending last month on grid electricity, kerosene, and other energy sources	See 1.7, 1.8, and 1.9 above
1.11	Home solar usage	HH	Indicator	Indicator for usage of solar lantern or solar home system	F12a
1.12	Power sharing	HH	Indicator	Indicator for household is sharing its electricity connection (e.g., electricity connection shared with a minor household or a neighboring household)	S1c, F5b, F5i, F5j

### 3.4 Family #2 – Household structure major outcomes

If there are changes in the patterns of energy consumption, there may also be changes in the structure of the household. For example, access to electricity may impact household structure by influencing incentives to migrate by making living in the household more attractive. Family 2 includes major outcomes relating to household structure, migration, and fertility.

Table 3. Household structure major outcomes

ID	Outcome	Unit	Type	Component(s)	Survey data
2.1	Household size	HH	Total	Total number of household members	Section A, hhsz
2.2	Inhabited location	HH	Indicator	Baseline structure currently inhabited	Staff records
2.3	Household stayed	HH	Indicator	Household did not move to a new location	Staff records, AA9
2.4	Members living elsewhere	HH	Total	Household members documented at baseline that are now living elsewhere	Section A

<sup>11</sup> For several energy spending categories (including kerosene), we recorded how much the household spent over the past seven days. In these cases, we will estimate spending over the past month by multiplying the weekly amount by a factor of approximately 4.3.

<sup>12</sup> This outcome will include all other energy-related expenditures recorded in the household survey, beyond grid electricity and kerosene.

2.5	Fertility	Resp.	Total	Number of times respondent (or sexual partner) has been pregnant since January 2014	sH3_3num_m, sH3_3num_f
2.6	Local social interactions	Resp.	Total	Number of times (over past week) neighboring respondents visited household and respondent visited neighboring households	Section K

### 3.5 Family #3 – Time use major outcomes

Household electrification may operate as a labor saving technology shock to home production, releasing female time from home to market work (Dinkelman 2011; Grogan and Sadanand 2012). Family 3 includes individual time use outcomes.

Table 4. Time use major outcomes

ID	Outcome	Unit	Type	Component(s)	Survey data
3.1	Hours sleeping	Resp.	Hours	Sleeping (code 1)	L1 to L48
3.2	Hours studying	Resp.	Hours	Playing with children or helping with homework (code 13) Studying or attending class (code 16) <i>Note: All codes representing “studying” in survey</i>	L1 to L48
3.3	Hours working	Resp.	Hours	Light farm work (code 22) Heavy farm work (code 23) Fishing or hunting (code 24) Office/desk work (code 25) Light manual work (code 26) Heavy manual work (code 27) Other (work and travel) (code 32) <i>Note: All codes representing “work” in survey</i>	L1 to L48
3.4	Hours doing chores	Resp.	Hours	Cooking or preparing food (code 7) Shopping for family (code 8) Cleaning, dusting, sweeping, washing dishes or clothes, ironing, or doing other household chores (code 9) Taking care of others, such as bathing, feeding, or looking after children, the sick, or the elderly (code 12) Fetching water or firewood (code 10) Repairs in or around the home (code 11) Improving land or buildings (code 28) <i>Note: All codes representing “chores” in survey</i>	L1 to L48
3.5	Hours enjoying leisure	Resp.	Hours	Rest, watching TV, listening to the radio, reading a book, watching a movie, watching sports, or sewing (code 6) Visiting or entertaining friends (code 14) Playing sports (code 17) Spending time with spouse or partner (code 18) <i>Note: All codes representing “leisure” in survey</i>	L1 to L48

### 3.6 Family #4 – Productivity major outcomes

If electrification changes people’s time use, and, for example, allows for more hours of work outside the home, there may be positive impacts on various measures of productivity and wealth.<sup>13</sup> The evidence on the impacts of electrification on productivity have been somewhat mixed. Dinkelman (2011), for example, finds evidence of increased female labor force participation in South Africa. Chakravorty, Emerick, and Ravago (2016) find large impacts of electrification on household income and expenditures in the Philippines, but attribute these impacts to increases in agricultural income rather than increases in labor force participation. In contrast, Burlig and Preonas (2016) find little to no impacts of electrification on various employment outcomes in rural India. Family 4 includes various measures of household agricultural activities, employment, small businesses, and other outcomes.

Table 5. Productivity major outcomes

ID	Outcome	Unit	Type	Component(s)	Survey data
4.1	Agriculture – Land use	HH	Proportion	Proportion of total land used for agricultural activities	C4a, C4b, D1c
4.2	Irrigation	HH	Indicator	Household used irrigation in last 12 months	D2e
4.3	Agriculture – Monthly revenue	HH	Total	Revenue from selling crops Revenue from selling livestock or livestock products Revenue from selling poultry or poultry products Revenue from selling fish Revenue from selling other agricultural produce <i>Note: Household revenue over past month</i>	D4a D4c D4e D4g D4i
4.4	Agriculture – Hours worked	Resp.	Total	Hours worked in agriculture in last 7 days	D3a
4.5	Employed or own business - Household	HH	Proportion	Proportion of household members (18 and over) currently employed or running their own business	A8b
4.6	Business at household	HH	Indicator	Business operated out of household compound	sE1_15cdescpremise, sE1_51otherbus
4.7	Employed or own business – Individual	Resp.	Indicator	Currently self-employed, running a business, employed, or working for pay	sE1_1selfemp, sE2_1employed
4.8	Employed or own business – Individual monthly compensation	Resp.	Total	Monthly compensation, sum of last month compensation across all jobs and businesses	sE2_11, sE1_9aprofit, sE1_56profit

<sup>13</sup> Grimm et al. (2015), for instance, present a theoretical model in which an increase in household electrification effectively reduces the price of energy faced by the household, which increases the productivity of domestic labor and the output of household production.

4.9	Employed or own business – Individual hours worked	Resp.	Total	Hours worked in self-employment in last 7 days Hours worked in employment in last 7 days	sE1_5wrkhrs sE2_7hours_1
4.10	Household chores – Individual hours worked	Resp.	Total	Hours spent doing household chores in last 7 days	sL_49hhchores
4.11	Total hours worked	Resp.	Total	Total hours worked in agriculture, self-employment, employment, and household chores in last 7 days	See 4.3, 4.8, and 4.9 above

### 3.7 Family #5 – Wealth major outcomes

In terms of wealth, Lipscomb, Mobarak, and Barham (2013) find evidence of higher average housing values as a result of electrification in Brazil. Family 5 includes a housing quality index and estimated values of different types of household assets, based on current market prices.

Table 6. Wealth major outcomes

ID	Outcome	Unit	Type	Component(s)	Survey data
5.1	Savings	Resp.	Total	Savings in mobile bank account Savings in SACCO, merry-go-round, or ROSCA Savings in formal bank account	G2a G2b G2c
5.2	Housing quality	HH	Index	Indicator for high-quality floors Indicator for high-quality roof Indicator for high-quality walls	C1a C1b C1c
5.3	Value of livestock assets	HH	Estimated value	Value of chickens owned Value of cattle owned Value of goats owned Value of pigs owned Value of sheep owned	C8a C8b C8c C8d C8e
5.4	Value of appliance assets	HH	Estimated value	Value of listed electrical appliances	F19a to F19c
5.5	Value of other assets	HH	Estimated value	Value of beds owned Value of bednets owned Value of kerosene stoves owned Value of kerosene lamps owned Value of hoes owned Value of bicycles owned Value of motorcycles owned Value of cars or trucks owned Value of sofa piece seats owned	C7a C7b C7c C7d C7e C7f C7g C7h C7i

5.6	Total asset value	HH	Estimated value	Estimated value of savings, livestock, electrical appliances, and other assets	See 5.1, 5.3, 5.4, and 5.5 above
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### 3.8 Family #6 – Consumption major outcomes

We are interested in estimating the impacts of electrification on various measures of household consumption, including a novel “neediness” index, developed in Ligon (2015). The neediness index is a measure of the marginal utility of expenditures and therefore household welfare. Unlike traditional total consumption expenditure measures, it does not impose an assumption of linear Engel curves. Instead, the index exploits differences in the composition of consumers’ consumption bundles, which vary with household welfare. In order to construct the index, Ligon (2015) suggests collecting information on a subset of key consumption items for which variation in expenditures is closely related to changes in marginal utility (and thus welfare). By appropriately weighting the consumption of each of the key items, we can obtain a summary measure of household welfare. In our setting in Western Kenya, we will focus on 23 items, including staples, vegetables, meat, fruits, and other goods. These 23 items were identified using data from the Kenya Life Panel Survey (KLPS-3).<sup>14</sup> Based on the KLPS-3 data, the 23 items account for 26% of total household consumption and 52% of total food consumption.

Table 7. Consumption major outcomes

ID	Outcome	Unit	Type	Component(s)	Survey data
6.1	Neediness index	HH	Index	Consumption of each of 23 goods over past twelve months, constructed according to the measure in Ligon (2015)	M5, M7, M8
6.2	Annual consumption	HH	Value	Estimated value of annual consumption of 23 goods	M5, M7, M8
6.3	Consumption diversity	HH	Index	Indicators for whether household has consumed each of 23 goods over the past twelve months	M1
6.4	Meals	Resp.	Total	Total number of meals eaten yesterday	sH1_1meals
6.5	Protein meals	Resp.	Total	Total number of meals eaten yesterday including meat or fish	sH1_2ameat

### 3.9 Family #7 – Health and wellbeing outcomes

Electricity has been found to improve respiratory health by reducing indoor air pollution (Barron and Torero 2015). Some people may also be happier when they have access to

<sup>14</sup> The KLPS-3 project is located in the same study region as this project and is led by PI Edward Miguel and other researchers. In the full KLPS survey, respondents are asked in detail about their consumption of 153 items.

electricity due to impacts on various channels. Family 7 includes various measures of respondent health and wellbeing.

Table 8. Health and wellbeing major outcomes

ID	Outcome	Unit	Type	Component(s)	Survey data
7.1	Respiratory illness index	Resp.	Index	Persistent cough Asthma/shortness of breath at night <i>Note: Experienced over past 4 weeks</i>	sH1_7bcough sH1_7sasthma
7.2	Respiratory illness index - Child	Child	Index	Frequent cough Itchy or stinging eyes Sore throat Runny nose Asthma or shortness of breath <i>Note: Experienced over past 7 days</i>	T3.5
7.3	Recent symptoms index	Resp.	Index	Fever Persistent cough Persistent tiredness Stomach pain Blood in stool Rapid weight loss Frequent diarrhea Skin rash or irritation Open sores/boils Difficulty swallowing Sores or ulcers on the genitals Asthma/shortness of breath at night Frequent and excessive urination Constant thirst/increased drinking of fluids Unusual discharge from the tip of penis ( <i>for men only</i> ) Other symptoms <i>Note: All symptoms experienced over past 4 weeks</i>	sH1_7afever sH1_7bcough sH1_7ctired sH1_7dstomach sH1_7fstool sH1_7gweightloss sH1_7hdiarrhoea sH1_7iskin sH1_7jboils sH1_7kswallow sH1_7pgenitalsore sH1_7sasthma sH1_7tfrequirine sH1_7uthirst sH1_7wdischarge sH1_7xother
7.4	Recent illnesses index	Resp.	Index	Worms Malaria Typhoid Tuberculosis Diabetes Cholera Yellow fever <i>Note: All illnesses experienced over past 4 weeks</i>	sH1_7eworms sH1_7mmalaria sH1_7ntyphoid sH1_7otb sH1_7vdiabetes sH1_7qcholera sH1_7ryellow
7.5	Recent illnesses index - Child	Child	Index	Malaria Fever	T3.5

				Typhoid <i>Note: All symptoms experienced over past 7 days</i>	
7.6	Subjective health	Resp.	Indicator	Self-described health is either “good” or “very good”	sH1_13healthgd
7.7	Subjective health - Child	Child	Indicator	Self-described health is either “good” or “very good”	T3.4
7.8	Life satisfaction	Resp.	Scale	Life satisfaction based on a scale of 1 to 10	J9b

### 3.10 Family #8 – Education outcomes

It is possible that electrification may improve educational outcomes for students, if better lighting allows for more evening study time, for instance. The evidence, however, has been somewhat mixed to date. Randomized trials, including Furukawa (2014) and Hassan and Lucchino (2016), have focused on measuring the impacts of decentralized power solutions, such as solar lanterns, and have documented results ranging from negative impacts to positive impacts with substantial spillovers. Studies on the impacts of grid connections have been mostly non-experimental and have found positive impacts of electrification on school enrollment, study time, and school completion (see, e.g., Khandker et al. 2012). Family 8 includes a variety of educational outcomes, including test scores from English and Math tests that were administered to students in the sample villages by our project field staff.

Table 9. Education major outcomes

ID	Outcome	Unit	Type	Component(s)	Survey data
8.1	English score	Child	Z-score <sup>15</sup>	English reading test result	T1
8.2	Math score	Child	Z-score	Math test result	T2
8.3	Average test score	Child	Z-score	Average of English reading test result and Math test result	T1, T2
8.4	Study hours - Total	Child	Total	Self-reported hours spent studying during the day Self-reported hours spent studying during the night	T3.1 T3.2
8.5	Study hours - Night	Child	Total	Self-reported hours spent studying during the night	T3.2
8.6	Attendance index	Child	Index	Fully completed first week of school last term Fully completed last week of school last term Completed end of term exams last term Fully completed first week of school this term	B2b B2c B2d B2e
8.7	Grades	Child	Score	Marks (scaled out of 100) earned last term	B2f
8.8	Ambitions	Child	Indicator	Student planning to attend post-secondary education	T3.7

<sup>15</sup> We will create Z-scores by subtracting the mean and dividing by the standard deviation in the control group, within our own sample using age-gender groups.

### 3.11 Family #9 – Social and political attitudes outcomes

Electrified households may consume more media content (via televisions, radios, and internet access), and as a result, could have greater knowledge of current affairs, or experience changes in social and political attitudes.

Table 10. Social and political attitudes major outcomes

ID	Outcome	Unit	Type	Details	Question
9.1	Radio	Resp.	Total	Days in the past week respondent listened to the radio	J2a
9.2	Television	Resp.	Total	Days in the past week respondent watched television	J2c
9.3	Internet	Resp.	Total	Days in the past week respondent used the internet	J2d
9.4	Political and social awareness index	Resp.	Index	Knows date of next election	J1a
				Knows name of the president of Tanzania	J1b
				Knows name of the president of Burundi	J1c
				Knows name of a candidate in the 2016 U.S. presidential election	J1d
				Knows name of the CEO of Safaricom	J1e
				Knows name of the Managing Director of Kenya Power	J1f
				Knows the intended recipients of the Kenyan national government’s Free Laptop program	J1i
				Knows who was responsible for the 2015 terrorist attacks at Garissa University	J1j
				Knows which team won the 2015-2016 English Premier League	J1g
				Knows who sings the pop song “Sura Yako”	J1h
				<i>Note: These are all binary variables</i>	
9.5	Approval of national government index	Resp.	Index	Trusts national government	J5g
				Uhuru Kenyatta is doing a good job as president	J7a
				Government is doing a good job fighting terrorism	J7b
				Government corruption is <u>not</u> a problem in Kenya	J7d
				Government is doing a good job ensuring that electricity is provided in Kenya	J7g
				<i>Note: Binary variable indicating “agree” or “strongly agree”</i>	
9.6	Gender equality index	Resp.	Index	It is acceptable for a woman to be a bus driver	J6a
				Important decisions of the family should <u>not only</u> be made by the man of the family	J6b
				If the wife is working outside the home, the husband should help her with household chores	J6c
				Women should have more opportunities to become political leaders	J6d
				<i>Note: Binary variable indicating “agree” or “strongly agree”</i>	
9.7	Ethnic identity index	Resp.	Index	Ethnic identity is “important” or “very important” in respondent’s life	J4e

				Indicator for belongs first to ethnic group (over other dimensions of identity)	J4f
9.8	Religiosity index	Resp.	Index	Religious identity is “important” or “very important” in respondent’s life Indicator for belongs first to religious group (over other dimensions of identity) Attends church/mosque regularly Attended church/mosque last week	J4d J4f J4a J4b
9.9	Social trust index	Resp.	Index	Trusts people, in general Trusts members of their own ethnic group Trusts members of other ethnic groups Trusts members of their own religion Trust members of other religions <i>Note: Indicator for “can be trusted” or “can be somewhat trusted”</i>	J5a J5b J5c J5d J5e

### 3.12 Family #10 – Community outcomes

There are a number of community-level outcomes that are of interest in this study. For example, Bernard and Torero (2015) find that take-up of electricity may be higher in communities where electricity is more prevalent. Therefore, a key outcome of interest in our study is whether the subsidy treatments impacted the proportion of secondary sample households choosing to connect to electricity. In addition, it is possible that electricity can lead to actual or perceived within-village inequality, in income, educational outcomes, and consumption. In order to estimate the impacts of electrification on within-community inequality, we will take advantage of our random sample of households and calculate Gini coefficients, capturing within-community dispersion, using the productivity (Family 4), wealth (Family 5), education (Family 8), and consumption (Family 6) outcomes in our data.<sup>16</sup>

Table 11. Community primary outcomes

ID	Outcome	Unit	Type	Details	Question
10.1	Community electrification rate	Com.	Proportion	Estimated community electrification rate	See Section 2.3
10.2	Community electricity reliability index	Com.	Index	Proportion of connected households reporting power blackouts in past 7 days Proportion of connected households reporting regular blackouts	F10c, F10d F10e
10.4	Value of assets inequality	Com.	Index	Gini coefficient capturing within-community dispersion in total asset value	See 5.6 above

<sup>16</sup> Note that we will weight observations according to their proportions (e.g. main sample, secondary sample, etc.) households in the baseline community census data.

10.5	Education inequality	Com.	Index	Gini coefficient capturing within-community dispersion in student test score results	T1, T2
10.6	Consumption inequality	Com.	Index	Gini coefficient capturing within-community dispersion in total consumption of 23 consumption goods	M5, M7, M8
10.7	Perceived income inequality	Com.	Proportion	Proportion of respondents agreeing with statement that economic inequality is a problem in this village	J7e

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<b>Survey information</b>
Greetings! You are about to begin "Living Standards Kenya 2014". Please fill in the following questions before engaging the respondent.
1. Please select your name:
2. Please enter your IPA ID number:
3. Elder/ guide name:
4. Transformer ID:
5. Household ID:
Great! We are set to go. When you are ready, please approach the respondent, introduce yourself, and begin the interview. Good luck!
<b>Living Standards Kenya (LSK) - Starting time: \${end_time}</b>
<b>Informed consent</b>
READ: Hello. How are you? I am [your name] from IPA, a research organization based in Busia town. We are conducting research on living standards in the rural parts of Kenya. We visited this area a while back, accompanied by village elder [village elder name] in order to know who lives in this area.
You have been randomly selected into our survey today. I trust that [village elder name] informed you of our visit today on [respondent contact/ tracking sheet]. I would like to ask you questions to help us understand the living standards of the people in this area.
I will keep everything that you tell me entirely private and will not talk to other people about what you say. I ask that you speak honestly, since we are only interested in collecting information at this point. There are no "right" or "wrong" answers. You can choose to stop this survey at any point in time or refuse to answer certain questions. If you have any questions, you can contact the person in charge of this survey at IPA.
Would you be willing to volunteer roughly 90 minutes of your time to speak with me?
NOTE: Please ensure that you give a copy of the consent form to the respondent.
<b>Informed consent not obtained</b>
READ: Thank you for your time and I hope that you have a wonderful day.
NOTE: Kindly exit the household so that you can take the GPS coordinates and finalize this survey.
Record your location.
Please enter any additional comments.

Section A - Roster
Main household
READ: Thank you. To begin, I would like to understand how many people live with you in your household and in this wider compound. Let us begin by thinking of only the people who live in this particular household.
1a. How many people in total live in your household and eat from the same pot?
1b. How many other people usually sleep or eat in your household that you have not counted?
1c. How many people that you have already counted use another home as their primary residence?
READ: For the remainder of this survey, when I ask you about your household, I would like you to only think of the $\{hhs\}$ people that we have just identified as living in your household.
Compound
READ: I would now like you to think about the wider compound (not just your household).
2a. How many people in total live in this compound (including yourself)?
2b. How many separate households (i.e. "pots") are in this compound (including your own)?
Paper section
READ: Can you please list the names of the $\{hhs\}$ people that are the core members of this household?
NOTE: Please write down the names of each household member on the unique roster sheet, beginning with the respondent, followed by the spouse, and then other household members beginning with the eldest. Do not forget to record the Site ID and HH ID.
NOTE: For each of the roster names that you have written down, please enter the following information, beginning with the respondent.
Roster sheet number
Birth
4a. Gender:
4b. Month of birth:
4c. Year of birth:
4d. Is this an estimated date of birth?
READ: So this person is $\{dob\}$ years old? (Note: If this is incorrect, go back and correct the date.)
Occupation and education
5a. Relationship to respondent:
5b. Highest level of education completed:
5c. Primary occupation(s):
5d. If highest education completed is other, please specify.
5e. If primary occupation is other, please specify.
Contact details
READ: I would now like to ask you for some basic contact information.
6a. Do you have a phone number available so that we can contact you in future interview rounds?
6b. Respondent phone number:
6c. Who's phone number is this?
6d. Relationship to respondent:
6e. Do you have a spouse?
6f. Does your spouse live in this household?
6g. Even though your spouse does not live here, is he/she involved in your day-to-day household decisions?
6h. Please enter the roster number of the spouse.
6i. Contact phone number of spouse:
7a. Alternate contact common name:
7c. Alternate contact phone number:

**Living Standards Kenya (LSK) - Paper Roster Sheet**

Transformer ID:  DD/MM/YY:  /  /

Household ID:

Field Officer ID:

Please write down the names of each household member, beginning with the respondent.

ID	Name (FIRST MIDDLE LAST)
----	--------------------------

*Record name of respondent first:*

1	
---	--

*Now, record names of other household members:*

2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	

Section B - Children's education
Introduction
READ: I would now like to ask you about the education levels of the children living in this household.
NOTE: The following section should be completed for (1) the youngest school-age child, and (2) the school-age child closest to Class 8. You should only record details for two children.
Child
School type
1a. Please enter the roster number for this child.
1b. What type of school does this child attend?
1c. Why doesn't this child attend school?
1d. If other, please specify.
Schooling participation
2a. During the current academic year, what class/ form is this student enrolled in?
2b. Last term, did this student fully complete the first week of school?
2c. Last term, did this student fully complete the last week of school?
2d. Last term, did this student sit for the end of term exams?
2e. Last term, how many total marks did this student earn?
2f. Did this student pass the last term?
2g. Are you planning to send this student to school during the next academic year?
2h. Why not?
Study habits
NOTE: For the following questions, please try to ask the student directly. Enter 12:34 if don't know.
3a. What time does this student go to sleep when there is class the following morning?
3b. What time does this student wake up when there is class in the morning?
3c. Over the past 3 days, how many hours has this student spent studying?
3d. Over the past 3 days, how many hours has this student spent doing household chores?
3e. Over the past 3 days, how many hours has this student spent playing?

Section C - Household characteristics
Building materials
NOTE: Please observe the materials of the floors, roof and walls, and record your observations in the following questions.
1a. What materials are the floors made of?
1b. What materials is the roof made of?
1c. What materials are the walls made of?
READ: I would now like to ask you a few questions about your home. Please think of your current residence only (i.e. the main house of the compound or the building where you eat). We are only interested in the current residence, not (necessarily) ancestral land (even if the current residence is a rental).
1d. What kind of toilet facilities does your household use most often?
1e. How many separate rooms do you have in your household?
1f. If floor material is other, please specify.
1g. If roof material is other, please specify.
1h. If wall material is other, please specify.
1i. If toilet is other, please specify.
Sources of water
2a. Over the past 7 days, what was your household's main source of drinking water?
2b. Over the past 7 days, what was your main source of water for other household activities?
2c. Have you ever done anything to your drinking water to make it safe to drink? If yes, what did you do?
2d. If drinking water is other, please specify.
2e. If other activities water is other, please specify.
2f. If treatment is other, please specify.
READ: How many of the following assets does your household own?
Household assets
3a. Bed
3b. Bednet
3c. Sofa pieces
3d. Kerosene stove
3e. Clock/watch
3f. Hoe
3g. Kerosene lamp
3h. Sewing machine
3i. Bicycle
3j. Motorcycle
3k. Car/truck

Section D - Land and agriculture
Introduction
READ: Thank you. I would now like to ask you about your land and agricultural activities.
1a. Does your household own any land?
1b. Does your household rent-in any land?
1c. Does your household own or rent the house where you live?
1d. Over the past 7 days, have you or any member of your household performed any agricultural or pastoral activities for your household?
1e. Does your household own any livestock?
Landowner
READ: Thank you. I would now like to ask you a few details about the land that you own.
2a. How much land does your household own?
2b. How much of this land is used for agricultural purposes?
2c. Over the past 12 months, did you rent out any of your land to people outside your household?
2d. How much of your land did you rent out?
2e. How much money do you receive each month for renting out this land?
Land renter
READ: You mentioned that you rent land. I would like to learn more about your rental activities.
3a. Over the past 12 months, how much land did you rent from others?
3b. How much of this land is used for agricultural purposes?
3c. Over the past 12 months, for which months did you rent this land?
3d. On average, how much did you pay each month to rent this land?
Home renter
4a. How much must you pay each month to rent this house?
4b. What is the name of your landlord?
4c. Relationship to respondent:
Activities
5a. What are the agricultural or pastoralist activities that members of your household perform?
5b. If other, please specify.
5c. What is the total size of the land that you use for all of these activities?
5d. For which activities are you the main decision maker?
Agriculture
READ: Thank you. I would now like to ask you a few details about your agricultural activities.
6a. What crops do you grow?
6b. Over the past 12 months, did you use any of the following?
Agricultural labor
READ: Thank you. I would now like to ask you how much time you and members of your household spend on these agricultural activities. Over the past 7 days...
7a. ...how many hours did you work in total on these activities?
7b. ...how many hours did your spouse work in total on these activities?
READ: Over the past 6 months...
7c. ...how many members of your own household worked on these activities?
7d. ...how many workers from outside your household did you hire in total for these activities?
Income from land-related activities
READ: Over the past 12 months, how much did you receive in total sales from...
8a. ...selling crops?
8b. ...selling livestock/ livestock products?
8c. ...selling poultry?
8d. ...selling fish?
8e. ...selling your "other" activity?
Livestock
READ: How many of the following livestock does your household own?

9a. Chickens
9b. Cattle
9c. Goats
9d. Pigs
9e. Sheep

Section E - Employment and income-generating activities
Introduction
READ: Thank you. I'd now like to ask you about your employment and income-generating activities.
1a. Other than farming, are you currently self-employed or running a business to earn a living?
1b. What about your spouse?
1c. Are you currently employed with a business/ organization? If so, what is your position?
1d. What about your spouse?
Business or self-employment activity
READ: I'd now like to learn about each of the businesses (or the activities that are performed while self-employed) in this household. Let's start with the business/ self-employment position that is the most important to you. Afterwards, we will continue on to any others.
Note: Collect information about the businesses or self-employment activities of the spouse as well, if applicable.
History
2a. Who performs this business/ self-employment activity?
2b. What is this occupation/ business?
2c. Does this occupation/ business use electricity?
2d. If other, please specify.
2e. In what year was this business/ self-employment activity started?
2f. How much had to be invested in order to start, purchase or gain control of this business?
2g. What was the main source of investment funds for this business?
2h. If other, please specify.
Labor
3a. How many workers in total are currently employed in this activity?
READ: Over the past 7 days, how many hours in total...
3b. ...did you work in this business?
3c. ...did your spouse work in this business?
READ: Over the past year, in which months...
3d. ...did you work in this business?
3e. ...did your spouse work in this business?
Revenue and profit
READ: I'd like to ask you a few more details about this particular business/ self-employment activity. Please remember that any data we collect will be kept entirely confidential.
4a. Over the past month, what was your total revenue (money-in only)?
4b. Over the past month, what was your total profit?
Entrepreneurship aspirations
READ: I'd now like to ask you about your future plans.
5a. Would your household want to start its own (or another) business in the next five years?
5b. What kind of business would you start?
5c. If other, please specify.
5d. Can you tell me why your household hasn't been able to start this business?
5e. If other, please specify.
5f. What if the location of your intended business was electrified. Would you still want to start the same type of business?
5g. What would you do instead?
5h. In your opinion, what is the biggest constraint(s) for people who own their own businesses?
5i. If other, please specify.
Employment activity
READ: Earlier, you mentioned that you were currently employed (for income) with a business/ organization. I'd now like to ask you some details about these positions.
Note: Be sure to collect information about the activities of the spouse as well, if applicable.

History and job description
6a. Who holds this position?
6b. What type of position is this?
6c. In what occupation/ business is this work?
6d. If other, please specify.
6e. In what year did this person start this position?
Working hours
7a. This position's working patterns could be best described as:
7b. Over the past 12 months, in which months did this person work in this position?
7c. Over the past 7 days, how many hours did this person work in this position?
Compensation
READ: I'd like to ask you a few more details about this particular position. Please remember that any data we collect will be kept entirely confidential.
READ: In the last month that this person was working, what was the total value...
8a. ...of your gross cash salary?
8b. ...of your benefits?

Section F - Energy
Sources of energy
READ: I would like to begin this section by asking you some questions about your energy use.
1a. Is this household connected to the national grid?
1b. What is your main source of lighting energy?
1c. What are your other (secondary) sources of lighting energy?
1d. What is your main source of cooking energy?
1e. What are your other (secondary) sources of cooking energy?
1f. Do you use any additional sources of energy?
1g. What are these sources of energy?
1h. If main source of lighting energy is other, please specify.
1i. If secondary source of lighting energy is other, please specify.
1j. If main source of cooking energy is other, please specify.
1k. If other source of cooking energy is other, please specify.
1l. If additional sources of energy is other, please specify.
Unconnected household
READ: Thank you. I would now like to ask you about your history with electricity. What are the reasons why your household does not have electricity?
NOTE: Allow respondent to respond naturally. When he/she has finished, select all of the reasons that apply.
2. Please select all that apply.
Past experience and history
3a. Have you ever lived in a building with electricity?
3b. For how many years of your life did you spend living in a building with electricity?
4a. Has anyone in this household ever applied for a connection with Kenya Power (KPLC) or Rural Electrification Authority (REA)?
4b. When did your household apply for this connection?
4c. What is the current status of your application?
4d. If other, please specify.
4e. Why was your application rejected?
Connected households
When was this household first connected to electricity?
5a. Month of connection:
5b. Year of connection:
5c. How many households within your compound are connected to electricity?
5d. Is there an electricity meter installed in your household?
5e. Did you experience any challenges obtaining wayleaves from your neighbors to connect your home?
5f. How many unique households (i.e. "pots"), including your own, are connected to your electricity meter?
5g. If you do not have an electricity meter in your household, from whom do you receive electricity service?
5h. Last month, how did you pay for your electricity service?
5i. Last month, how much did your household pay on its electricity bill?
5j. Do you use any devices to protect your appliances from power surges?
6a. Did you experience any power blackouts in the past three days?
Blackouts and power quality
6b. For roughly how many hours was the power not working in the past 3 days?
6c. At what point of the day was the power not working?
6d. Do these types of blackouts occur regularly?

6e. Do you expect that the reliability of your electricity supply will improve in the future?
READ: Thank you. I would now like to ask you details about your energy sources.
Kerosene usage
7. In the past 7 days, how much money in total did your household spend on kerosene?
Solar lanterns
8a. How many solar lanterns does your household use?
READ: I'd like you to think only about the main solar lantern that you use.
8b. Do you own, rent or hire purchase this solar lantern?
8c. How much did you pay for this solar lantern?
8d. In the past month, how much did you pay to rent or hire purchase this solar lantern?
8f. Does your solar lantern allow you to charge mobile phones?
Solar home systems
9a. How many solar home systems does your household use?
READ: I'd like you to think only about the main solar home system that you use.
9b. Do you own, rent or hire purchase this solar home system?
9c. How much did you pay for this solar home system?
9d. In the past month, how much did you pay to rent or hire purchase this solar home system?
9e. Does your solar home system allow you to charge mobile phones?
Batteries (dry cells) & car batteries (wet cells)
10a. How much did you pay to purchase your wet cell (i.e. car) batteries?
10b. In the past 7 days, how much did you spend recharging your wet cell (i.e. car) batteries?
10c. In the past 7 days, how much did you spend on your dry cell batteries?
10d. Is this because your batteries are rechargeable?
Generator
11a. When did your household first begin using a generator?
11b. How much did you pay for this generator?
11c. In the past 7 days, how much did you spend on fuel for this generator?
11d. For what activities do you use this generator?
11e. If other, please specify.
Other sources of energy
12a. In the past 7 days, how much did you spend on purchased firewood?
12b. In the past 7 days, how much did you spend on charcoal?
12c. In the past 7 days, how much did you spend on LPG?
12d. In the past 7 days, how much did you spend on sawdust?
READ: Earlier, you mentioned that you use another source of energy. In the past 7 days, how much did you spend...
12e. ...on this other source of lighting fuel?
12f. ...on this other source of cooking fuel?
12g. ...on this other source of additional energy?
Additional energy costs
13. In the past 7 days, how much money was spent to recharge all of your household's mobile phones?

READ: Thank you. Now I'd like to ask you about your indirect energy costs.
NOTE: Try naming the various energy sources to aid the respondent. For example, do you use a boda boda to pick up kerosene etc.? This should include the cost of associated with taking a phone to be recharged as well.
14a. In the past 7 days, have you spent any additional money in order to collect/ acquire your energy sources?
14b. In the past 7 days, how much additional money did you spend to acquire all of your energy sources?
Lighting hours
READ: Thank you. I'd now like to ask you about your lighting hours. What time did you...
15a. ...Begin using your lighting last night?
15b. ...Stop using your lighting last night?
15c. Did you use your lighting this morning as well?
What time did you...
15d. ...Begin using your lighting this morning?
15e. ...Stop using your lighting this morning?
Willingness to pay
READ: As you know, electricity requires two types of payments: First, you must pay for the connection cost. Second, you must pay for the monthly service fee (i.e. bill). I'd like you to first think about only the connection cost.
16a. How much do you think it costs to obtain an electricity connection?
READ: I would now like you to think about a situation that is not real. This is just a hypothetical situation. Imagine that you could pay a "lump sum" price for an electricity connection. In other words, you are offered a price and you have a period of time to decide whether to take this price. If you decide to take the price, you have to pay all at once, after which you are immediately connected.
16b. Would you be willing to pay \${{aa6}} Ksh for an electricity connection?
16c. Imagine that you were offered an electricity connection at this price today, and you were given 6 weeks to complete the payment. Would you accept the offer?
16d. Why not?
16e. If other, please specify.
READ: Thank you. I would like to confirm that the current price of an electricity connection from Kenya Power is 35,000 Ksh.
READ: Now, I would like to ask you about another situation that is not real. Suppose that you are able to "hire purchase" an electricity connection. If you choose to accept this plan, you will have to pay a deposit at the beginning, after which you will be required to pay a fixed amount each month for a certain number of months.
16f. Would you be willing to pay [X] Ksh as a deposit, followed by monthly payments of [Y] Ksh for a period of [Z] months for an electricity connection? Note: In total, you would be paying [XX] Ksh over the lifetime of the plan.
16g. Imagine that you were offered an electricity connection under this plan today. Would you accept the offer?
16h. Why not?
16i. If other, please specify.
READ: Now suppose that you are still able to "hire purchase" an electricity connection. However, a deposit is no longer required. You will only have to pay a fixed amount each month until you have fully paid the 35,000 Ksh in total. Example: If the fixed amount is 1,000 Ksh, you would have to pay this amount for 35 months.
16j. How much would you be willing to pay each month for an electricity connection until the 35,000 Ksh has been fully paid?
16k. Imagine that you were offered an electricity connection under this plan today. Would you accept the offer?
16l. Why not?
16m. If other, please specify.
READ: Now, I would like you to think about only the monthly service fee (i.e. bill).
16j. How much of your income could you afford to pay per month for electricity service?
Electrical appliances
READ: Thank you. Now I'd like to ask you about electrical appliances.
17a. Does your household own any electrical appliances?

17b. What electrical appliances do you own?
17c. If other, please specify.
17d. What will be the next electrical appliance(s) that you will purchase?
17e. If other, please specify.
17f. If you had an electricity connection, what would be the next electrical appliance(s) that you would purchase?
17g. If other, please specify.

Section G - Miscellaneous
Savings activities
READ: I would like to begin this section by asking you some questions about your savings activities.
1a. Do you have a bank account?
1b. Do you use any mobile banking services?
1c. Do you participate in a SACCO, merry-go-round, or ROSCA?
READ: In the past 12 months...
1d. ...have you ever borrowed money from a commercial bank/ lender, moneylender, or someone else outside your household?
1e. ...did you ever try to borrow money but were refused? If so, from who did you try to borrow money?
Awareness
READ: Thank you. Over the past 7 days, on how many days did you...
2a. ...listen to the radio?
2b. ...read the newspaper?
2c. ...watch the television?
Please name the...
3a. ...current President of Tanzania for me.
3b. ...current President of Uganda for me.
3c. ...immediate former President of the United States for me.
Safety
4. With regards to safety, would you describe this area as somewhat secure, very secure or insecure?

Section H - Time use
READ: I would now like to ask about your activities during the past 24 hours starting with yesterday at 6am up until this morning at 6am. For each half hour, you should tell me what you did during that half hour. If you had several activities, please let me know the main activity.
<b>A. Morning activities</b>
6:00 - 6:30
6:30 - 7:00
7:00 - 7:30
7:30 - 8:00
8:00 - 8:30
8:30 - 9:00
9:00 - 9:30
9:30 - 10:00
10:00 - 10:30
10:30 - 11:00
11:00 - 11:30
11:30 - 12:00
<b>B. Afternoon activities</b>
12:00 - 12:30
12:30 - 13:00
13:00 - 13:30
13:30 - 14:00
14:00 - 14:30
14:30 - 15:00
15:00 - 15:30
15:30 - 16:00
<b>C. Evening activities</b>
16:00 - 16:30
16:30 - 17:00
17:00 - 17:30
17:30 - 18:00
18:00 - 18:30
18:30 - 19:00
<b>D. Night activities</b>
19:00 - 19:30
19:30 - 20:00
20:00 - 20:30
20:30 - 21:00
21:00 - 21:30
21:30 - 22:00
22:00 - 22:30
22:30 - 23:00
23:00 - 23:30
23:30 - 00:00
00:00 - 00:30
00:30 - 1:00
1:00 - 1:30
1:30 - 2:00
2:00 - 2:30
2:30 - 3:00
3:00 - 3:30
3:30 - 4:00

4:00 - 4:30
4:30 - 5:00
5:00 - 5:30
5:30 - 6:00

Section I - Health
Consumption and habits
READ: I'd now like to ask you some questions about your own health and nutrition.
1a. How many meals did you eat yesterday?
1b. Over the past 7 days, have you smoked any cigarettes?
1c. Do you consume alcohol? If yes, over the past 7 days, how many alcoholic drinks have you had?
Over the past 4 weeks...
2a. ...have you slept under a mosquito net?
2b. ...have all of your children slept under a mosquito net?
Subjective health...
Over the past month...
3a. ...how much of the time have you been a very nervous person?
3b. ...how much of the time have you felt calm and peaceful?
3c. ...how much of the time have you been a happy person?
3d. ...how much of the time have you felt very sad?
3e. Would you describe your general health as somewhat good, very good or not good?
Illnesses and hospitals
4a. Over the past 4 weeks, which symptoms or illnesses have you experienced?
4b. If someone in the household were in labor, where would they go for services?
Over the past 4 weeks...
4c. ...how many days of work, housework, or school did you miss due to poor health?
4d. ...how many days of school did your child/ children miss due to a health related issue?
4e. ...how many days of work, housework or school did your spouse miss due to poor health?
Over the past 4 weeks, how much did your household spend in total (in cash or in-kind) on...
5a. ...hospital/ clinic medical care (not including medicine)?
5b. ...modern medicine to treat a health problem?
5c. ...traditional medicine to treat a health problem?

Section K - Markets
<b>Posho mills</b>
READ: We have now come to the final section of this survey. In this section, I'd like to ask you about the grain and flour purchases in your household.
NOTE: In this section, "you" refers to the person in the respondent's household who typically visits a posho mill. For example, if it is the respondent's spouse who typically visits the posho mill, ask the respondent to try to remember the details about his/her spouse's last visit to a posho mill.
1a. Over the past 4 weeks, has anyone from your household visited a posho mill?
1b. Over the past 4 weeks, which grains were either purchased or ground at a posho mill?
1c. If nobody visited a posho mill, where do you obtain your grain and/or flour?
1d. If other, please specify.
1e. If other, please specify.
<b>Local posho mill</b>
READ: I'd like you to think about the posho mill that your household visits most often.
2a. Where is this posho mill?
2b. Is this an electric or diesel posho mill?
2c. What are the main reasons why your household frequents this posho mill?
2d. If other, please specify.
2e. How many times did members of your household visit this particular posho mill in the past month?
2f. Are there any other businesses/ shops located close to this posho mill?
<b>Last visit to local posho mill</b>
READ: I'd like you to now think about the last time your household visited this posho mill, regardless of the person who made the visit.
3a. When was this visit?
3b. Which member(s) of your household made this visit?
3c. Did you bring your own grains during this visit?
3d. How many minutes did it take you to travel there (one-way)?
3e. ...By what method?
3f. What did you purchase at the posho mill?
<b>Purchases during last visit</b>
READ: Thank you. I'd like you to continue thinking about the last time you visited this posho mill.
4a. How much did you spend in total on grinding services?
4b. For how many units?
4c. Specify unit.
4d. How much did you spend in total on vegetables and groceries?
4e. How much did you spend in total on grains?
4f. For how many units?
4g. Specify unit.
4h. How much did you spend in total on flour?
4i. For how many units?
4j. Specify unit.
4k. How much did you spend in total on livestock feed?
4l. How much did you spend in total on all other goods and services purchased from neighboring shops?
4m. Did you fetch any other basic, free necessities during this trip? If so, what did you fetch?

Grain/ flour consumption
READ: I would now like you to think about the total amount of grains/ flour that your household has consumed over the past month.
5a. How many units did your household consume in total?
5b. Specify unit.
5c. Of this amount, how many units were either purchased or milled at this particular posho mill?
5d. Specify unit.

<b>Section Z</b>
Living Standards in Kenya Survey - Ending time: $\{end\_time\}$
READ: Thank you very much for your time, all of this information will be kept strictly confidential. We will follow up with you in a year or so. You will receive no direct benefits for having participated in this survey.
Thank you for your hard work! You have reached the end of the survey. Please fill in the remaining questions after you have exited the house.
<b>Comprehension and cooperation</b>
1a. Rate the comprehension level of the respondent:
1b. Rate the cooperation level of the respondent:
<b>Presence of others</b>
2a. Was anyone else present during the interview?
2b. What is the name of this person?
2c. Did this person assist the respondent with his/her answers?
<b>Location</b>
3. Record your location.
<b>Comments</b>
4. Please enter any additional comments.

<b>Introduction</b>
<b>Survey information</b>
Greetings! You are about to begin "Living Standards Kenya 2016". Please fill in the following questions before engaging the respondent.
1. Please select your name:
2. Please enter your IPA ID number:
3. Elder/ guide name:
4. Transformer ID:
5. Household ID:
6. Is this a Spillover Sample household?
7. Are you interviewing the original respondent?
8. What target is the person you are interviewing?
<b>Additional Location Information</b>
8b. Why were you not able to interview target 1 or 2?
9. In which category is the household being surveyed?
10. What was the household ID of the old household that used to live in this location?
FO: Go ahead and interview the current household that is here but also complete the missing household information if none of the original household members stays here.
FO: Please go back to the original location after completing this survey. If a new family is living there, please complete a full spillover survey using the household ID "98" or "99". If nobody is living at the old location, please complete the Missing HHD form
<b>Survey information</b>
Great! We are set to go. When you are ready, please approach the respondent, introduce yourself, and begin the interview. Good luck!

Informed consent
Script
READ: Hello. How are you? I am {aa1} from IPA, a research organization based in Busia town. We have another office in Siaya town. We are conducting research on living standards in the rural parts of Kenya. We visited this area a while back, accompanied by village elder {aa3} in order to know who lives in this area. As you may know, two years ago we helped some households in this area get a connection to electricity. We have finished with that program now. Currently, we are not connecting any more houses to electricity, we are only conducting a survey to measure living standards.
SOMA: You have been randomly selected into our survey today. I trust that village elder - {aa3} informed you of our visit today on [respondent contact/ tracking sheet]. I would like to ask you questions to help us understand the living standards of the people in this area.
SOMA: I will keep everything that you tell me entirely private and will not talk to other people about what you say. I ask that you speak honestly, since we are only interested in collecting information at this point. There are no "right" or "wrong" answers. You can choose to stop this survey at any point in time or refuse to answer certain questions. If you have any questions, you can contact the person in charge of this survey at IPA.
Would you be willing to volunteer roughly 2 hours of your time to speak with me?
Informed consent obtained
NOTE: Please ensure that you give a copy of the consent form to the respondent.
Informed consent not obtained
READ: Thank you for your time and I hope that you have a wonderful day.
NOTE: Kindly exit the household so that you can take the GPS coordinates and finalize this survey.
Record your location.
Please enter any additional comments.

Section A - Main Sample Roster
Contact details
What is your name?
What is your year of birth?
NOTE: Please enter the observed sex of the respondent below without asking.
The respondent's sex is:
READ: I would now like to ask you for some basic contact information.
1d. Do you have a phone number where we can contact you in the future?
1e. Could you please tell me your phone number again?
1f. Whose phone number is this?
1g. Was anyone from this household living in this same house two years ago, in 2014?
Compound check
1h. Was anyone from this household living in this same compound two years ago, in 2014?
1i. Think that of the house you were living in two years ago in the same compound. What is the current status of this house?"
Phone Number Check
NOTE: The two phone numbers do not match! Please go back and make sure you entered the same, correct phone number twice.
Relationship to Respondent
6d. Relationship of owner of cell phone to respondent:
Roster Names
READ: Below are the names from data we collected two years ago of people living in your household. Please tell me if this person still lives in this household.
READ: For these next questions, please think only of the people who regularly eat and sleep in this house. If somebody lives in a different simba in this compound (boma), please tell us that this person does not live in this house. Later, we will ask about other people living in other simba's in this compound (boma).
NOTE: If the name is not spelled correctly or the year of birth is not correct, please ignore this for now.
Does \${OldName1} (birthyear \${OldYear1}) live here?
READ: There may be more people who are currently living in this household but whose information we did not record two years ago. We will ask about them later. For now, let's focus on the people above.
3b. DO NOT READ ALOUD: Does anyone from the original household live here?
3c. Why did the original household leave? (Don't Know = 99)
Moving Date
3d. When did the original household leave?
MM:
3e. YY:
3f. What is your relationship to the head of the original household?
Reasons for Leaving
READ: I would now like to know why some people no longer live in your household.
2a. Why does \${OldName1} (birthyear \${OldYear1}) no longer live here?
Check whether details are correct
READ: I would now like to check whether the information that we have is correct.
3a. Our data says that \${OldName1} was born in the year \${OldYear1}, sex \${OldSex1}. Is their name spelled correctly, and is this information correct?

What is incorrect
READ: You mentioned that some of the information is incorrect. Let's see what specifically is incorrect.
3a. What is incorrect about the details of \${OldName1} (birthyear \${OldYear1}, sex \${OldSex1})?
Correct any details that are incorrect
READ: For the information that you said was incorrect, I now would like to get the correct information.
4a. What is the correct spelling of the name of \${OldName1} (birthyear \${OldYear1})?
4b. What is the birth year of \${OldName1} (birthyear \${OldYear1})?
4c. What is the sex of \${OldName1}?
Correct any details that are incorrect
READ: I would now like to know the education and the occupation of the people that are on the roster so far.
What is the highest level of education completed by \${Name1New} (birthyear \${Year1New})?
Are they currently employed or running their own business?
What is the current occupation of \${Name1New} (birthyear \${Year1New})?
Complete Roster Names
READ: Right now I have recorded that the following people live here:
\${Name1New} (birthyear \${Year1New})
Does anybody else live in this house that is not listed above? Please think only of the people who regularly eat and sleep in this house. Please do not include anybody who lives in a different Minor Household in this compound (boma). Later, we will ask about other people living in other Minor Households in this compound (boma).
New Members
What is their name?
What is their sex?
What is their year of birth?
What is their highest level of education completed?
Are they currently employed or running their own business?
What is their current occupation?
READ: When did this person join the household?
Year:
Month:
Why was this person not living here in 2014?
Check Complete Roster Names
READ: Right now I have recorded that the following people live here:
\${Name1New} (birthyear \${Year1New})
\${Name31} (birthyear \${Year31})
Is this list correct and include everybody that lives in this house?
NOTE: Please check that the respondent's name, \${a1a}, is listed correctly in the list above. If the respondent is not listed, or if their name is spelled incorrectly, please go back and edit their name.
NOTE: From the list above, please count how many people are now living in this main household
Number of people in household:
Roster Names
NOTE: The information was not complete. Please go back and change the relevant information.
Additional comments?

Section A - Secondary Sample Roster
Respondent Details
What is your highest level of education completed?
Are you currently employed or running your own business?
What is your current occupation?
How many children born in the years 2000, 2001, 2002, 2003, or 2004 live in this household? Please think only of the children who regularly eat and sleep in this house. Please do not include any children who live in a different Minor Household in this compound. Later, we will ask about other people living in other Minor Household's in this compound.
READ: Please complete the following information for each child born in the years 2000, 2001, 2002, 2003, or 2004
Children
What is his/her name?
What is his/her gender?
What is his/her year of birth?
What is his/her highest level of education completed?
Is he/she currently in school?
Other People
How many other people live in this household besides you and the children mentioned above? Please think only of the people who regularly eat and sleep in this house. Please do not include anybody who lives in a different Minor Household in this compound. Later, we will ask about other people living in other Minor Households in this compound.
READ: I will now ask about the first person.
What is their sex?
What is their year of birth?
What is their highest level of education completed?
Are they currently employed or running their own business?
What is their current occupation?
How many structures are there in this compound? Please include any buildings where anybody eats or sleeps, including your own home. Also count workplaces, like a kitchen, workshop, or chicken coop. Do not count a latrine.
Other Structures
How many of these §{a18b} structures are connected to the national grid?
How many of these §{a18b} structures are used by people in your own household?
Does anybody else live in any other Minor Households in this compound?
Other Minor Households
How many other Minor Households are there in this compound where at least one person usually eats and sleeps?
DO NOT READ ALOUD: You said that there are §{a19a} minor households. Is this correct?
NOTE: Before proceeding, please think back and count how many children in the years 2000, 2001, 2002, 2003, or 2004 you counted in the roster above. Please confirm that this number matches the next question.
How many children born in the years 2000, 2001, 2002, 2003, or 2004 live in this household? Please think only of the children who regularly eat and sleep in this house. Please do not include any children who live in a different Minor Household in this compound.

Section B - Children's education
School type
READ: I would now like to ask you about the study habits for all of the children in your household born between 2004 (age 12) and 2000 (age 16). You said that there are \${targetkids} in this age range in this household.
NOTE: If this is correct, please fill out \${targetkids} repeat groups.
NOTE: If there are no children listed in this age group in this household, skip to next section.
Child
1. Child Name:
Child Age Confirmation
1aa. I would like to see the child's health card in order to record his/her birthdate. Would it be possible to see this card right now?
Child Age
1bb. RECORD CHILD'S BIRTH MONTH AND YEAR FROM HEALTH CARD. IF NOT AVAILABLE OR DOES NOT CONTAIN BIRTHDATE, ASK "In what month and year was the baby born?"
MM:
1cc. YY:
1dd. DO NOT READ: Is the child's birthdate between January 2000 and December 2004?
School type
READ: Let's begin with the child named \${b1}.
1a. What type of school does this child attend?
1b. What is the name of this school?
School type
1c. Why doesn't this child attend school?
School type
1d. If other, please specify.
Schooling participation
2a. What class/ form is this student currently enrolled in?
LAST term (i.e., first term of 2016)...
2b. ...did this student fully complete the first week of school?
2c. ...did this student fully complete the last week of school?
2d. ...did this student complete the end of term exams?
THIS term (i.e., second term of 2016)...
2e. ...did this student fully complete the first week of school?
Schooling participation
2f. Last term, how many total marks (out of Maximum possible) did this student earn?
2g. Did this student pass the last term?
2h. Has this student registered for the 2016 KCPE?
Schooling participation
2i. You recorded that the student scored \${b2f} (out of Maximum possible) total marks. Is that correct?
2j. What is the student's KCPE index (i.e., registration) number?
2k. Why not?
Study habits
NOTE: For the following questions, please try to ask the student directly. Enter 12:34 if don't know.

3a. What time does this student go to sleep when there is class the following morning?
3b. What time does this student wake up when there is class in the morning?
DO NOT READ ALOUD: Are you sure b3a is correct?
DO NOT READ ALOUD: Are you sure b3b is correct?
<b>Study habits</b>
NOTE: Please try to ask the student the following questions directly.
Over the PAST 3 DAYS, how many hours in total has this student spent...
3c. ...studying during daytime?
3d. ...studying during nighttime?
3e. ...helping out with household chores?
3f. ...playing?
3g. ...helping out with farming activities?
3h. ...helping out with other labour/work (non-farming) activities outside the household?
3hh. In the last seven days, how many days have you gone to a school or clinic with electricity to study in the evening?
3i. DO NOT READ ALOUD: Did you receive answers to the study habit questions from the student directly?
<b>Module T Consent</b>
READ: I would also like to administer a short reading, arithmetic, and logic test to this student. The test will take about 20 minutes in total and is unrelated to the student's schoolwork. It will not influence his/her schooling grades. In total, we plan to administer this test to roughly 2,500 students between the ages of 12 and 16 in Busia and Siaya. We will use the information from the tests to assess the level of academic performance in this region. The student does not need to finish the test if he or she prefers not to.
4. Will you give us permission to ask [NAME] to participate in our reading and arithmetic test?
<b>Module T Consent</b>
4a. Is [NAME] available to be tested now?
<b>Module T Consent</b>
5a. Will [NAME] be at school on Saturday and available to be interviewed after class?
READ: We will visit [NAME]'s school this Saturday and will interview him/her after class time. If something changes and [NAME] will not be available at school on Saturday then please call the number on this card to reschedule the testing at a convenient time and location.
5b. Where can we interview [NAME]? (eg. "Home", " School- [school name]", "[market name]", etc.)
<b>Testing Appointment Date</b>
5c. On what day is the scheduled test?
5cii. Month:
5d. At what time is the scheduled test?
5e. Please record any other details.
<b>Testing Appointment Date</b>
NOTE: Confirm the following with the respondent, then write this information on the appointment card and give it to the respondent. Day: \${b5c}, \${b5cii} Time: \${b5d} Location: \${b1b}

NOTE: Confirm the following with the respondent, then write this information on the appointment card and give it to the respondent.

Day: \${b5c}, \${b5cii}

Time: \${b5d}

Location: \${b1b}

READ: If anything changes and [NAME] is not available at this day, time and location, please call the number on this card to reschedule.

6. DO NOT READ ALOUD: Did you test a child? If not, why not?

6a. If [NAME] is NOT attending school today, please record the reason.

Section M - Consumption Goods
READ: Now I want to ask about food purchases made for your household, regardless of which person made them. Please exclude from your answer any food purchased for processing, livestock consumption, or resale in a household enterprise.
READ: First I will ask you about some staples that you eat at home. Include grains used for food or alcohol.
Staples
1. Has your household consumed \${staples_id} during the past 12 months?
2. Has your household grown or produced \${staples_id} during the past 12 months?
Staples
3. How much \${staples_id} have the members of your household purchased in the last 7 days? UNIT:
3. SPECIFY OTHER UNIT:
AMOUNT:
4. During the last 12 months, how many months was your household consuming \${staples_id} that your household grew or produced?
5. During these months that your household grew or produced \${staples_id}, how much did your household consume in a typical week? UNIT:
5. SPECIFY OTHER UNIT:
AMOUNT:
6. How many months in the past 12 months did your household purchase \${staples_id}?
7. Please think of the months in which your household purchased \${staples_id}. How much does your household usually spend on \${staples_id} in a typical week of the months that your household purchases \${staples_id}? UNIT:
7. SPECIFY OTHER UNIT:
AMOUNT:
8. What is the total amount of the \${staples_id} consumed that your household received as a gift in the past 12 months? UNIT:
8. SPECIFY OTHER UNIT:
AMOUNT:
READ: Now I will ask you about some vegetables and legumes that you eat at home.
Vegetables
1. Has your household consumed \${veg_id} during the past 12 months?
2. Has your household grown or produced \${veg_id} during the past 12 months?
Vegetables
3. How much \${veg_id} have the members of your household purchased in the last 7 days? UNIT:
3. SPECIFY OTHER UNIT:
AMOUNT:
4. During the last 12 months, how many months was your household consuming \${veg_id} that your household grew or produced?
5. During these months that your household grew or produced \${veg_id}, how much did your household consume in a typical week? UNIT:
5. SPECIFY OTHER UNIT:

AMOUNT:
6. How many months in the past 12 months did your household purchase \${veg_id}?
7. Please think of the months in which your household purchased \${veg_id}. How much does your household usually spend on \${veg_id} in a typical week of the months that your household purchases \${veg_id}?
UNIT:
7. SPECIFY OTHER UNIT:
AMOUNT:
8. What is the total amount of the \${veg_id} consumed that your household received as a gift in the past 12 months?
UNIT:
8. SPECIFY OTHER UNIT:
AMOUNT:
READ: Now I will ask you about some meats and related products that you eat at home.
Meat
1. Has your household consumed \${meat_id} during the past 12 months?
2. Has your household produced \${meat_id} during the past 12 months?
Meat
3. How much \${meat_id} have the members of your household purchased in the last 7 days?
UNIT:
3. SPECIFY OTHER UNIT:
AMOUNT:
4. During the last 12 months, how many months was your household consuming \${meat_id} that your household grew or produced?
5. During these months that your household grew or produced \${meat_id}, how much did your household consume in a typical week?
UNIT:
5. SPECIFY OTHER UNIT:
AMOUNT:
6. How many months in the past 12 months did your household purchase \${meat_id}?
7. Please think of the months in which your household purchased \${meat_id}. How much does your household usually spend on \${meat_id} in a typical week of the months that your household purchases \${meat_id}?
UNIT:
7. SPECIFY OTHER UNIT:
AMOUNT:
8. What is the total amount of the \${meat_id} consumed that your household received as a gift in the past 12 months?
UNIT:
8. SPECIFY OTHER UNIT:
AMOUNT:
READ: Now I will ask you about some other food purchases consumed at home.
Other
1. Has your household consumed \${other_id} during the past 12 months?
2. Has your household grown or produced \${other_id} during the past 12 months?
Other
3. How much \${other_id} have the members of your household purchased in the last 7 days?
UNIT:

3. SPECIFY OTHER UNIT:
AMOUNT:
4. During the last 12 months, how many months was your household consuming $\${other\_id}$ that your household grew or produced?
5. During these months that your household grew or produced $\${other\_id}$ , how much did your household consume in a typical week?
UNIT:
5. SPECIFY OTHER UNIT:
AMOUNT:
6. How many months in the past 12 months did your household purchase $\${other\_id}$ ?
7. Please think of the months in which your household purchased $\${other\_id}$ . How much does your household usually spend on $\${other\_id}$ in a typical week of the months that your household purchases $\${other\_id}$ ?
UNIT:
7. SPECIFY OTHER UNIT:
AMOUNT:
8. What is the total amount of the $\${other\_id}$ consumed that your household received as a gift in the past 12 months?
UNIT:
8. SPECIFY OTHER UNIT:
AMOUNT:
READ: Now I will ask you about fruits that you eat at home.
Fruit
1. Has your household consumed $\${fruit\_id}$ during the past 12 months?
2. Has your household grown or produced $\${fruit\_id}$ during the past 12 months?
Fruit
3. How much $\${fruit\_id}$ have the members of your household purchased in the last 7 days?
UNIT:
3. SPECIFY OTHER UNIT:
AMOUNT:
4. During the last 12 months, how many months was your household consuming $\${fruit\_id}$ that your household grew or produced?
5. During these months that your household grew or produced $\${fruit\_id}$ , how much did your household consume in a typical week?
UNIT:
5. SPECIFY OTHER UNIT:
AMOUNT:
6. How many months in the past 12 months did your household purchase $\${fruit\_id}$ ?
7. Please think of the months in which your household purchased $\${fruit\_id}$ . How much does your household usually spend on $\${fruit\_id}$ in a typical week of the months that your household purchases $\${fruit\_id}$ ?
UNIT:
7. SPECIFY OTHER UNIT:
AMOUNT:
8. What is the total amount of the $\${fruit\_id}$ consumed that your household received as a gift in the past 12 months?
UNIT:
8. SPECIFY OTHER UNIT:

AMOUNT:
Additional comments?

## SECTION L - Time use / Activities in past 24 hours

READ: I would now like to ask about your activities during the past 24 hours starting with yesterday at 6am up until this morning at 6am. For each half hour, you should tell me what you did during that half hour. If you had several activities, please let me know the main activity.

## Instructions

## NOTES:

-IF A PERSON IS PERFORMING HOUSE CHORES AS A JOB (E.G. A HOUSEGIRL), THE ACTIVITY IS "AT WORK-LIGHT MANUAL" OR "AT WORK-HEAVY MANUAL".

-IF A PERSON IS PERFORMING AGRICULTURAL LABOR AS A JOB, THE ACTIVITY IS EITHER "LIGHT FARM WORK" OR "HEAVY FARM WORK".

-IF A PERSON IS FISHING OR HUNTING AS A JOB, THE ACTIVITY IS "FISHING AND HUNTING".

## Instructions

## NOTES (Do not read aloud):

-IF A STUDENT IS ON MID-DAY BREAK FROM SCHOOL, CODE WHAT THEY ARE DOING (E.G. EAT, REST, STUDY, OR PLAY SPORTS).

-ONCE THE RESPONDENT TELLS YOU WHEN HE/SHE GOES TO BED, ASK HIM/HER WHAT TIME HE/SHE GOT UP AND RESPOND TO QUESTIONS FOR THOSE TIMES ACCORDINGLY.

1. Yesterday, from 6:00 to 6:30, what were you doing?

SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.

SPECIFY OTHER - WORK AND TRAVEL.

2. Yesterday, from 6:30 to 7:00, what were you doing?

SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.

SPECIFY OTHER - WORK AND TRAVEL.

3. Yesterday, from 7:00 to 7:30, what were you doing?

SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.

SPECIFY OTHER - WORK AND TRAVEL.

4. Yesterday, from 7:30 to 8:00, what were you doing?

SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.

SPECIFY OTHER - WORK AND TRAVEL.

5. Yesterday, from 8:00 to 8:30, what were you doing?

SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.

SPECIFY OTHER - WORK AND TRAVEL.

6. Yesterday, from 8:30 to 9:00, what were you doing?

SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.

SPECIFY OTHER - WORK AND TRAVEL.

7. Yesterday, from 9:00 to 9:30, what were you doing?

SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.

SPECIFY OTHER - WORK AND TRAVEL.

8. Yesterday, from 9:30 to 10:00, what were you doing?

SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.

SPECIFY OTHER - WORK AND TRAVEL.

9. Yesterday, from 10:00 to 10:30, what were you doing?

SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.

SPECIFY OTHER - WORK AND TRAVEL.

10. Yesterday, from 10:30 to 11:00, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
11. Yesterday, from 11:00 to 11:30, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
12. Yesterday, from 11:30 to 12:00 noon, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
13. Yesterday, from 12:00 noon to 12:30, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
14. Yesterday, from 12:30 to 13:00, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
15. Yesterday, from 13:00 to 13:30, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
16. Yesterday, from 13:30 to 14:00, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
17. Yesterday, from 14:00 to 14:30pm, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
18. Yesterday, from 14:30 to 15:00, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
19. Yesterday, from 15:00 to 15:30, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
20. Yesterday, from 15:30 to 16:00, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
21. Yesterday, from 16:00 to 16:30, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
22. Yesterday, from 16:30 to 17:00, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
23. Yesterday, from 17:00 to 17:30, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
24. Yesterday, from 17:30 to 18:00, what were you doing?

SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
25. Yesterday, from 18:00 to 18:30, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
26. Yesterday, from 18:30 to 19:00, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
27. Yesterday, from 19:00 to 19:30, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
28. Yesterday, from 19:30 to 20:00, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
29. Yesterday, from 20:00 to 20:30, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
30. Yesterday, from 20:30 to 21:00, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
31. Last night, from 21:00 to 21:30, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
32. Last night, from 21:30 to 22:00, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
33. Last night, from 22:00 to 22:30, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
34. Last night, from 22:30 to 23:00, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
35. Last night, from 23:00 to 23:30, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
36. Last night, from 23:30 to 24:00 what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
37. Today, from 00:00 to 00:30, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
38. Today, from 00:30 to 1:00, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.

SPECIFY OTHER - WORK AND TRAVEL.
39. Today, from 1:00 to 1:30, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
40. Today, from 1:30 to 2:00, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
41. Today, from 2:00 to 2:30, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
42. Today, from 2:30 to 3:00, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
43. Today, from 3:00 to 3:30, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
44. Today, from 3:30 to 4:00, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
45. Today, from 4:00 to 4:30, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
46. Today, from 4:30 to 5:00, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
47. Today, from 5:00 to 5:30, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
48. Today, from 5:30 to 6:00, what were you doing?
SPECIFY OTHER - PERSONAL, FAMILY, AND SOCIAL.
SPECIFY OTHER - WORK AND TRAVEL.
Household chores
READ: In the last seven days...
49. ...how many hours have you spent doing household chores for your household?
50. ...how many people have performed household chores for your household in total?
Additional comments?

<b>Section F - Energy</b>
<b>Main and secondary energy sources</b>
READ: I would like to begin this section by asking you some questions about your energy use.
1a. Does this household have a connection to the national grid?
1b. What is your main source of lighting energy?
1c. What are your other (secondary) sources of lighting energy?
1d. What is your main source of cooking energy?
1e. What are your other (secondary) sources of cooking energy?
1f. Do you use any additional sources of energy?
<b>Other sources of energy</b>
1g. What are these sources of energy?
1h. If main source of lighting energy is other, please specify.
1i. If secondary source of lighting energy is other, please specify.
1j. If main source of cooking energy is other, please specify.
1k. If other source of cooking energy is other, please specify.
<b>Other sources of energy</b>
1l. If additional sources of energy is other, please specify.
<b>No electricity connection</b>
READ: What are the reasons why your household does not have electricity?
NOTE: Allow respondent to respond naturally. When he/she has finished, select all of the reasons that apply.
2. Please select all that apply.
3a. Has anyone in this household ever applied for an electricity connection?
<b>No electricity connection</b>
3b. When did your household apply for this connection?
3c. What is the current status of your application?
READ: I will now ask you three questions about how you personally feel about having electricity in your home. We have heard different reasons so we would now like to hear about your specific home.
NOTE: Please now complete the three qualitative survey questions on paper. Pay special attention to record detailed notes for these questions. Please go slowly, take your time, and try to write down as much as you can of what the respondent is telling you.
3d. What are the best things about having an electricity connection?
3e. What are the worst things about having an electricity connection?
3f. If you had electricity, how do you think it would change your life? These could be good changes or bad changes.
3g. What are the good or bad things about your neighbor having an electricity connection?
<b>Willingness to pay</b>
READ: As you know, electricity requires two types of payments: First, you must pay for the connection cost. Second, you must pay for the monthly service fee (i.e. bill). I'd like you to think about only the connection cost.
READ: I would like you to think about a situation that is not real. Imagine that there was no government program to provide electricity - Last Mile Connectivity Project (LMCP). In addition, in order to obtain an electricity connection, you must pay a "lump sum" price. In other words, you are offered a price and you have a period of time to decide whether to take this price. If you decide to take the price, you have to pay all at once, after which you are immediately connected.
6g. Would you be willing to pay \${{TotAmt}} Ksh for an electricity connection?
<b>Willingness to pay</b>

3h. Imagine that you were offered an electricity connection at \${{TotAmt}} today, and you were given 6 weeks to complete the payment. Would you accept the offer?
READ: Now suppose that no upfront payment is required and you are allowed to pay for an electricity connection slowly over time. In other words, you are required to pay a fixed amount each month, for a period of three years, until you have fully paid for the electricity connection.
3i. Would you be willing to pay \${{MonthAmt}} Ksh each month for a period of three years, so that you will pay \${{TotAmt}} Ksh in total?
Electricity connection
READ: When was this household first connected to electricity? Record the approximate date that electricity first began to flow into this household.
4a. Month of connection:
4b. Year of connection:
4c. In total, how much did you pay to connect your household to the electricity grid?
READ: I would like you to think about a situation that is not real. Imagine that there was no government program to provide electricity - Last Mile Connectivity Project (LMCP). In addition, you have relocated to a neighboring compound in which you do not have an electricity connection. In order to obtain an electricity connection, you must pay a "lump sum" price. In other words, you are offered a price and you have a period of time to decide whether to take this price. If you decide to take the price, you have to pay all at once, after which you are immediately connected.
4d. Would you be willing to pay \${{TotAmt}} Ksh for an electricity connection?
Electricity connection
4e. Imagine that you were offered an electricity connection at \${{TotAmt}} Ksh today, and you were given 6 weeks to complete the payment. Would you accept the offer?
READ: Now suppose that no upfront payment is required and you are allowed to pay for an electricity connection slowly over time. In other words, you are required to pay a fixed amount each month, for a period of three years, until you have fully paid for the electricity connection.
4f. Would you be willing to pay \${{MonthAmt}} Ksh each month for a period of three years, so that you will pay \${{TotAmt}} Ksh in total?
4g. Please think for a moment about how much you paid in total for your electricity connection (\${{f4c}} shillings). Knowing what you know today, would you pay this amount for electricity again? If you didn't pay anything, would you want to be connected again for free?
4h. Generally speaking, how satisfied are you with your electricity connection?
4i. Over the past 7 days, has your electricity connection delivered power to your home?
Electricity connection
4j. Why not?
READ: How long has the electricity connection not been working?
4k. Length of time:
4l. Select units:
Electricity connection
4m. If other reason why there is no power, please specify.
READ: I will now ask you three questions about how you personally feel about having electricity in your home. We have heard different reasons so we would now like to hear about your specific home.
NOTE: Please now complete the three qualitative survey questions on paper. Pay special attention to record detailed notes for these questions. Please go slowly, take your time, and try to write down as many details as you can of what the respondent is telling you.
4n. What are the best things about having an electricity connection?

4o. What are the worst things about having an electricity connection?
4p. How has electricity changed your life? These could be good changes or bad changes.
4p1. What are the good or bad things about your neighbor having an electricity connection?
4q. In your interaction with Kenya Power have you ever been asked to pay a bribe?
Electricity meter
5a. What type of electricity meter do you have?
5b. Where is this electricity meter installed?
5c. Please enter the meter number.
5f. Record the meter reading. PLEASE RECORD THE NUMBERS DISPLAYED ON THE METER.
DO NOT READ ALOUD: Why were you not able to record the meter number?
Electricity meter
5d. Please re-enter the meter number.
5g. Re-record the meter reading. PLEASE RECORD THE NUMBERS DISPLAYED ON THE METER.
5e. Is this electricity meter currently working?
Electricity meter
DO NOT READ: The responses indicate that the electricity connection has recently been working, but the meter is currently not working. Does this indicate that the FR is currently using electricity free of charge?
5h. DO NOT READ: Select an answer.
5i. READ: How many households (i.e., "pots") within your compound, including your own, are connected to electricity?
5j. How many households outside of your compound are connected to your electricity meter?
Household wiring
6a. Is this household using an IPA ready-board?
READ: How many...
6b. ...electrical outlets do you have available?
6c. ...lighting sockets do you have available?
6d. ...lightbulbs are you using?
6e. ...power extensions are you using?
Prepaid consumption
READ: When was your last top-up?
7a. Select month:
7b. Select year:
7c. What was the amount of your last top-up?
READ: In the past three months...
7d. ...how many times did you top-up?
7e. ...how much in total did you spend on top ups?
7f. What issues or problems have you experienced when topping-up?
NOTE: Identify and examine the household's main lightbulb. Try to get the lightbulb in the main household living room if they have one. What is the wattage printed on the lightbulb?
7g. Record the wattage.
7g1. I would now like you to think only about the cost of using electricity. In other words, please do not think about the cost of obtaining the electricity connection. Based on your experience, how much do you think it will cost to switch on this lightbulb for one hour? NOTE TO FIELD OFFICER: PLEASE REMIND FR TO TAKE A MOMENT TO THINK THIS OVER. IT IS OK IF THE FR PROVIDES AN ESTIMATE.

7i. Last month, do you think the price of electricity was lower than, higher than, or the same as usual?
7j. Next month, do you think that the price of electricity will be lower, higher, or the same?
Postpaid consumption
READ: I would now like to ask you about your monthly electricity bill.
8a. How much was the amount of your last monthly electricity bill?
8b. Please re-enter the amount.
8c. For which month did you receive your last bill?
8d. Without looking at your electricity bill, can you list the different components of your electricity bill (please name as many items as possible)?
8e. Last month, how much electricity did you consume in kWh (estimate)?
NOTE: Identify and examine the household's main lightbulb. What is the wattage printed on the lightbulb?
8f. Record the wattage.
8g. I would now like you to think only about the cost of using electricity. In other words, please do not think about the cost of obtaining the electricity connection. Based on your experience, how much do you think it will cost to switch on this lightbulb for one hour? NOTE TO FIELD OFFICER: PLEASE REMIND FR TO TAKE A MOMENT TO THINK THIS OVER. IT IS OK IF THE FR PROVIDES AN ESTIMATE.
Postpaid consumption
8h. Last month, do you think the price of electricity was lower than, higher than, or the same as usual?
8i. Next month, do you think that the price of electricity will be lower, higher, or the same?
Has anyone from Kenya Power visited your household in order to check your meter...
9a. ...over the past month?
9b. ...over the past 3 months?
9c. ...over the past 6 months?
Blackouts and power quality
READ: Over the past 3 days...
10a. Are power outages a problem in your village?
10b. ...did your household experience any power blackouts?
10c. ...for roughly how many hours was the power not working?
Blackouts and power quality
READ: Over the past 7 days...
10c. ...did you experience any power blackouts?
10d. ...for roughly how many hours was the power not working?
10e. Do blackouts occur regularly?
10f. Do you expect that the reliability of your electricity supply will get better, stay the same, or get worse in the future?
10g. Do you use any devices to protect your appliances from power surges?
10h. Did these power outages limit your ability to do your work this week?
READ: Thank you. I would now like to ask you details about your energy sources.
Kerosene usage
11. In the past 7 days, how much money in total did your household spend on kerosene?
Solar lanterns and solar home systems
12a. Do you use a solar lantern or solar home system?
Solar lanterns and solar home systems
12b. Have you ever used a solar lantern or solar home system?

12c. How long have you been using a solar lantern or solar home system?
Solar lanterns and solar home systems
12d. Why did you stop using your solar lantern or solar home system?
Solar lanterns
13a. How many solar lanterns do you use in this household?
READ: I'd like you to think only about the main solar lantern that you use.
13b. Do you own, rent or hire purchase this particular solar lantern?
Solar lanterns
13c. How much did you pay for this particular solar lantern?
13d. How much did you pay upfront (as a "deposit") to rent or hire purchase this particular solar lantern?
13d. In the past month, how much did you pay to rent or hire purchase this particular solar lantern?
13f. Does this particular solar lantern allow you to charge mobile phones?
Solar home systems
14a. How many solar home systems do you use in this household?
READ: I'd like you to think only about the main solar home system that you use.
14b. Do you own, rent or hire purchase this particular solar home system?
Solar home systems
14c. How much did you pay for this particular solar home system?
13d. How much did you pay upfront (as a "deposit") to rent or hire purchase this particular solar home system?
14d. In the past month, how much did you pay to rent or hire purchase this particular solar home system?
14f. Does this particular solar home system allow you to charge mobile phones?
Batteries (dry cells) & car batteries (wet cells)
15a. How much did you pay to purchase your primary wet cell (i.e. car) battery?
15b. In the past 7 days, how much did you spend recharging this wet cell (i.e. car) battery?
15c. In the past 7 days, how much did you spend on your dry cell batteries?
Batteries (dry cells) & car batteries (wet cells)
15d. Is this because your batteries are rechargeable?
Generator
16a. When did your household first begin using a generator?
16b. How much did you pay for your primary generator?
16c. In the past 7 days, how much did you spend on fuel for your primary generator?
16d. For what activities do you use this generator?
Generator
16e. If other, please specify.
Other sources of energy
17a. In the past 7 days, how much did you spend on purchased firewood?
17b. In the past 7 days, how much did you spend on charcoal?
17c. In the past 7 days, how much did you spend on LPG?
17d. In the past 7 days, how much did you spend on sawdust?
READ: Earlier, you mentioned that you use another source of energy. In the past 7 days, how much did you spend...
17e. ...on this other source of lighting fuel?
17f. ...on this other source of cooking fuel?
17g. ...on this other source of additional energy?

17j1. In the past 7 days, where have you gone to charge your household's mobile phones?
Other sources of energy
19a2. Where does your household most frequently charge their cell phones?
17h. In the past 7 days, how much money was spent to recharge all of your household's mobile phones?
17i. In the past 7 days, have you spent any additional money in order to collect/ acquire your energy sources? For example, the money spent on boda boda when collecting kerosene, firewood, charcoal, etc.?
Other sources of energy
17j. In the past 7 days, how much additional money did you spend to acquire all of your energy sources?
Lighting hours
18. Did you use your lighting last night?
Lighting hours
READ: What time did you...
18a. ...Begin using your lighting last night?
18b. ...Stop using your lighting last night?
18c. Did you use your lighting this morning as well?
Are you sure f18a is correct?
Are you sure f18b is correct?
Lighting hours
READ: What time did you...
18d. ...Begin using your lighting this morning?
18e. ...Stop using your lighting this morning?
Are you sure f18d is correct?
Are you sure f18e is correct?
Electrical appliances
READ: Thank you. Now I'd like to ask you about electrical appliances.
19a. Does your household own any electrical appliances, such as a cell phone or a radio? If an appliance is broken but you plan to fix it, please still include it.
Electrical appliances
NOTE: Recall that an electrical appliance is any electronic device that can be plugged into an electricity socket.
19b. What electrical appliances do you own? Please include type of device or machine that uses electricity. Also please count any devices that are being used by anyone living in this household
19c. What other electrical appliances do you own?.
19d. What will be the next electrical appliance(s) that you will purchase?
19e. What are the other electrical appliances that you will purchase?
19f. If you had an electricity connection, what would be the next electrical appliance(s) that you would purchase?
19g. What would be the other electrical appliances that you would next purchase if you had an electricity connection?
20. Prior to this interview, had you ever heard of the Last Mile Connectivity Project?
Additional comments?

Section J - Social and Political Attitudes
Knowledge quiz
READ: I will now ask you ten questions related to current events.
NOTE: Do not read the responses aloud. Only mark whether the answer given was correct.
1a. What is the month and year of the next general election in Kenya?
The correct answer is "August 2017". Did the respondent answer this question correctly?
1b. Who is the current President of Tanzania?
The correct answer is "John Pombe Magufuli". Did the respondent answer this question correctly?
1c. Who is the current President of Burundi?
The correct answer is "Pierre Nkurunziza". Did the respondent answer this question correctly?
1d. This year in November there will be elections in the USA for the next President of the USA, to succeed Barack Obama. Can you name one of the candidates?
The correct answers are Donald Trump, Hillary Clinton, Bernie Sanders, Ted Cruz, or John Kasich. Bill Clinton is not correct. Did the respondent name at least one of these people?
1e. Who is the CEO of Safaricom?
The correct answer is "Robert Collymore" or "Bob Collymore". Did the respondent answer this question correctly?
Knowledge quiz
1f. Who is the Managing Director of Kenya Power?
The correct answer is "Ben Chumo". Did the respondent answer this question correctly?
1g. Which team won the 2015-16 English Premier League?
The correct answer is "Leicester City". Did the respondent answer this question correctly?
1h. Who sings the song Sura Yako?
The correct answer is "Sauti Sol". Did the respondent answer this question correctly?
1i. Who were the intended recipients of the Government's Free Laptop Program?
The correct answer is "Class 1 Pupils". Did the respondent answer this question correctly?
1j. Who was responsible for the attacks at Garissa University last year?
The correct answer is "Al-Shabaab". Did the respondent answer this question correctly?
Media
Over the past 7 days, on how many days did you...
2a. ...listen to the radio?
2b. ...read the newspaper?
2c. ...watch television?
2d. ...use the internet (e.g., articles, emails, facebook and other social media etc.)?
Religion
4c. What is your current religion or denomination?
FO Note: if the respondent answers "NO RELIGION": please take care asking the next two questions. If the respondent has already told you they never attend church, you do not need to re-ask the question.
4a. Do you attend church/mosque regularly?
4b. Did you attend church/mosque last week?
Religion
FO Note: if the respondent answers "NO RELIGION": please take care asking the next two questions. If the respondent has already told you they never attend church, you do not need to re-ask the question.
4d. Is your religion very important, somewhat important, or not very important to your life?

4e. Is your ethnic identity very important, somewhat important, or not very important to your life?
4f. We have spoken to many people and they have all described themselves in different ways. Some people describe themselves in terms of their language(e.g. Luo, luhya, Teso etc), religion (Christian, muslim etc), race, (African, Indian etc) gender (Male or female), and others describe themselves in economic terms, such as working class, middle class, or a farmer. Besides being a Kenyan, which specific group do you feel you belong to first and foremost?
<b>Trust</b>
5a. Would you say that most people can be trusted or that you need to be careful in dealing with people? Please choose one of the following answers: most people can be trusted, people can be somewhat trusted, I need to be careful, or I need to be very careful.
<b>READ: I will now ask you a few questions about how much you trust other people in your community. For each question, choose one of the following answers: Trust a lot, Trust somewhat, Don't trust and Don't trust at all.</b>
5b. In general, how much do you trust members of your own ethnic group?
5c. In general, how much do you trust members of other ethnic groups?
5d. In general, how much do you trust people of your church/mosque?
5e. In general, how much do you trust people of other churches/mosques?
5f. In general, how much do you trust your county government in Siaya/Busia?
5g. In general, how much do you trust the national government of Kenya?
<b>Opinions</b>
<b>READ: I will now make statements about your personal opinions. For each question, please choose one of the following answers: you agree strongly, you agree only, you neither agree nor disagree, you disagree only, or you disagree strongly.</b>
6a. It is okay for a woman to be a bus driver or matatu driver.
6b. The important decisions in the family should be made by the man of the family.
6c. If the wife is working outside the home, then the husband should help her with household chores.
6d. Women should have more opportunities to become political leaders.
6e. I have equal access to economic opportunities as any other other Kenyan.
6f. Moving to the town provides better economic opportunities.
6g. I would feel comfortable to go live and work somewhere else in Kenya.
6h. Having an electricity connection inside the home improves a family's quality of life.
<b>Opinions</b>
7a. Uhuru Kenyatta is doing a good job as president.
7b. The government is doing a good job fighting terrorism in Kenya.
7c. There is no threat of terrorism in Western Kenya (for example, Al-Shabaab).
7d. Government corruption is a problem in Kenya.
7e. Economic inequality (meaning the differences in incomes between different people) is a problem in this village.
7f. Economic inequality (meaning the differences in incomes between different people) is a problem in Kenya.
7g. The government is doing a good job ensuring that electricity is provided in Kenya.
<b>Opinions</b>
9a. Taking all things together, would you say you are "Very happy", "Rather happy", "Not very happy", or "Not at all happy"?
<b>READ: I would now like you to think of a scale in which 1 means you are "completely dissatisfied" and 10 means you are "completely satisfied". So 1 means you are "completely dissatisfied". 2 means you are a little bit more satisfied than 1, but still very dissatisfied. 3 means you are a little bit more satisfied than 2, but still quite dissatisfied. Continuing all the way up the ladder to 9 where you are "very satisfied" and 10 where you are "completely satisfied".</b>

9b. All things considered, how satisfied are you with your life as a whole these days? Please choose one number between 1 and 10.
9c. How satisfied are you with the financial situation of your household? Please choose one number between 1 and 10.
10. With regards to safety, would you describe this area as very secure, secure, neither secure nor insecure, insecure, or very insecure?
8a. Did you vote in the last general election in 2013?
8b. Do you intend to vote in the next general election in 2017?
Additional comments?

Section E1 - Self-Employment
READ: I would now ask you some questions about your employment status.
READ: Please remember that this survey is confidential and that the information will be used for research purposes only.
1. Other than farming, are you currently self-employed or running a business to earn a living?
READ: Now we would like to learn about each of the current businesses you are running or the activities you are performing while self-employed, starting with your current most important self-employment position.
Self-employment
READ: Now, let's talk about your next business.
2. In what industry is this business?
2a. SPECIFY OTHER
3. Who is the main decision-maker for this business?
3a. SPECIFY OTHER RELATIONSHIP.
4. Does this business use electricity?
5. How many hours did you work in total in this business in the last 7 days?
6. In the last 12 months, how many months did you work in this business?
7. How many workers are you currently employing, not including yourself?
8a. What were your total earnings (money in only – do not subtract any expenses) from this business in the last month? Here we mean the amount you received from this business for sales & services provided BEFORE subtracting any expenses for payment of workers, or purchase of inputs, personal, or family items. Please report this in Kenyan shillings.
8b. What were your total earnings from this business in the last 12 months?
9a. What was your total profit from this business in the last month?  Here we mean the amount you received AFTER paying for expenses for this business, including hired workers, money for household members who helped, purchase of goods for sale or for inputs, such as raw materials, fuel, and electricity, but BEFORE purchasing personal items for yourself or your household. Please report this in Kenyan shillings.
9b. What was your total profit from this business in the last 12 months?
12. In what month and year did you start, purchase, or gain control of this business? Month:
Year:
13. How much did you have to invest in order to start, purchase or gain control of this business? Please report this in Kenyan shillings.
13a. How did you obtain the resources you initially invested in this business?
13a. SPECIFY OTHER:
13b. SPECIFY RELATION:
13b. SPECIFY OTHER RELATION.
14. Have you made any new investments or expansions to your business in the past 12 months?
14a. What type of investment or expansion was this?
14a. SPECIFY OTHER TYPE:
15. Do you own the premises of your business?
15a. How much do you pay for rent per month? Please report this in Kenyan shillings.
15c. Please describe the premises / location in which you do your business.
15c. SPECIFY OTHER PREMISES:
IF THERE IS ANOTHER BUSINESS OR ACTIVITY, SELECT "ADD GROUP."
IF YOU HAVE RECORDED 3 ACTIVITIES, SELECT "DO NOT ADD" ANOTHER GROUP.

37b. Since January 2014, have you ever closed, sold or transferred control of a business?
READ: We would like to learn about the history of businesses you have closed, sold or transferred control of since January 2014
38. In what year did you most recently close, sell or transfer control of a business?
39. Did you close, sell or transfer control of the business?
39a. For what amount did you sell the business? Please report this in Kenyan shillings.
39b. To whom did you transfer or sell the business?
39b. SPECIFY OTHER RELATIONSHIP:
40. Why did you choose to close, sell or transfer control of your business?
40. SPECIFY OTHER REASON:
41. In what industry is this business?
41. SPECIFY OTHER INDUSTRY.
49. Would you want to start your own (or another) business in the next five years?
49a. What kind of business would you start?
49a. SPECIFY OTHER
49b. Please tell me the main reasons why you have not yet started a business (or another business).
49b. SPECIFY OTHER REASONS:
49c. How much funding would you need to start your own (or another) business?
50a. What are the three biggest barriers to the growth and success of your business?
50b. In your opinion, what is the biggest constraint(s) for people who own their own businesses?
50a. SPECIFY OTHER BARRIER.
50b. SPECIFY OTHER CONSTRAINT
51. Are there any other businesses that are operating in this compound (that we haven't previously discussed)?
52. In what industry is this business?
52b. Who owns this business?
52a. SPECIFY OTHER
53. Does this business use electricity?
54. How many workers does this business currently employ?
55. What were the total earnings from this business in the last month? Here we mean the amount received from this business for sales & services provided before subtracting any expenses for payment of workers, or purchase of inputs, personal, or family items. Please report this in Kenyan shillings.
56. What was the total profit from this business in the last month?  Here we mean the amount received after paying for expenses for this business, including hired workers, money for household members who helped, purchase of goods for sale or for inputs, such as raw materials, fuel, and electricity, but before purchasing personal items for yourself or your household. Please report this in Kenyan shillings.
Additional comments?

## Section E2 - Employment

READ: Now we would like to learn about what jobs you currently hold, including both paid and unpaid jobs (and internships and attachments), starting with your most important position. Please do not include self-employment positions in your answer.

1. Are you currently employed, working for pay?

Current jobs

Now, let's talk about your next job.

2. In what month and year did you start this job?

YEAR:

MONTH:

3. In what occupation is this work?

3. SPECIFY OTHER OCCUPATION:

5. In this position, what is your employment status?

5. SPECIFY OTHER STATUS:

6. This position's working patterns could be best described as:

6. SPECIFY OTHER PATTERN:

6a. In which months did you work at this job during the last 12 months?

7. How many hours did you work at this job during the last 7 days?

8. What is the relationship between you and your employer?

8. SPECIFY OTHER RELATIONSHIP:

Please estimate your total compensation from this job over the last month. Please include your cash salary, in addition to any other benefits such as: payment in kind in food, NSSF / health insurance, housing benefits, uniforms / clothing benefits, training allowance, and any other allowances and benefits.

11. What is / was the amount of your total compensation over the past month? Please record this amount in Ksh.

You listed \$E2\_11 Ksh. Is that correct?

14. For how many weeks were you actively looking for work before you were hired for this job?

15. On average, how many minutes does it take you to get to this job from where you normally stay?

17. Do you have another current job?

IF THE FR HAS ANOTHER JOB, CHOOSE "ADD GROUP".

17a. You currently have \$njobs jobs. Is that correct?

18a. At any time since January 2014, were you employed, working for pay?

18b. In which months did you work at any job for pay during the last 12 months? Include the current month.

19. Are you currently looking for a job, or another job?

20. Why not?

20. SPECIFY OTHER REASON.

21. During the last 7 days, how many hours did you spend actively searching for jobs, applying for jobs, or in interviews?

22. During the last 7 days, what did you do to try to get a job, or another job?

22. SPECIFY OTHER:

22. SPECIFY OTHER FRIEND/RELATIVE.

22. SPECIFY OTHER RELATIONSHIP.

34. Did you leave a job this month?

35. Why did you leave this work?

35. SPECIFY OTHER REASON:

Additional comments?

Section H - Health
READ: Now I would like to ask you some questions about your health and nutrition.
READ: Please remember that this survey is confidential and that the information will be used for research purposes only.
1. How many meals did you eat yesterday? Chai (tea) itself is not to be considered as a meal.
2a. Did any of these meals include meat or fish?
2b. Did any of these meals include eggs?
4. How would you rate your appetite over the last 7 DAYS?
5. In the last 7 DAYS, have you smoked any cigarettes?
6. In the last 7 DAYS, how many alcoholic drinks have you had?
7. READ: I am going to read to you a list of illnesses and symptoms. Please let me know if you have experienced any of these illnesses or symptoms in the last four weeks.
(7A) Fever
(7B) Persistent cough
(7C) Always feeling tired
(7D) Stomach pain
(7E) Worms
(7F) Blood in stool
(7G) Rapid weight loss
(7H) Frequent diarrhea
(7I) Skin rash or irritation
(7J) Open sores / boils
(7K) Difficulty Swallowing
(7L) Serious wound or injury
(7M) Malaria
(7N) Typhoid
(7O) Tuberculosis
(7P) Sores or ulcers on the genitals
(7Q) Cholera
(7R) Yellow fever
(7S) Asthma / breathlessness at night
(7T) Frequent and excessive urination
(7U) Constant thirst / increased drinking of fluids
(7V) Diabetes
(7W) Unusual discharge from the tip of the penis.
(7X) Anything else that I have not mentioned?
(7X) DESCRIBE OTHER SYMPTOM.
11. Did you sleep under a bednet last night?
12. During the last 4 weeks, how many days of work or housework or school did you miss due to poor health?
13. How would you describe your general health?
Marriage
PLEASE ENSURE THE PRIVACY OF THE FR FOR THIS SECTION. IF THERE ARE INDIVIDUALS WITHIN EARSHOT WHO APPEAR TO BE OVER AGE 5, ASK TO SPEAK WITH THE FR PRIVATELY.

<p>READ: Now I would like to ask you some questions about any marriages you might have had. Please remember that this survey is confidential and that the information will be used for research purposes only. Also, I understand it may be difficult or upsetting to talk about, but please remember to include marriages that may now be over.</p>
<p>3. Since January 2014, have you married anyone? Do not include a marriage that began before January 2014.</p>
<p>4. Are you currently married?</p>
<p>5. Do you have plans to be married in the next 12 months?</p>
<p><b>Fertility</b></p>
<p>PLEASE ENSURE THE PRIVACY OF THE FR FOR THIS SECTION. IF THERE ARE INDIVIDUALS WITHIN EARSHOT WHO APPEAR TO BE OVER THE AGE OF 5, PLEASE ASK TO SPEAK WITH THE FR PRIVATELY.</p>
<p>READ: Now I would like to ask you some questions about your fertility and any children you might have. Please remember that this survey is confidential and that the information will be used for research purposes only. Also, I understand it may be difficult or upsetting to talk about, but please remember to include pregnancies that did not end in live birth.</p>
<p>3. Since January 2014, how many times has a sexual partner of yours been pregnant with your child (including pregnancies that are current or ended in stillbirth, miscarriage or abortion)?</p>
<p>3. Since January 2014, how many times have you been pregnant (including pregnancies that are current or ended in stillbirth, miscarriage or abortion)?</p>
<p>READ: Let's discuss these recent pregnancies, starting with the first one since January 2014 if there was more than one.</p>
<p><b>Pregnancies</b></p>
<p>NOTE: ENTER TWINS AS TWO SEPARATE PREGNANCIES.</p>
<p>4. What was your relationship to the father / mother during the time of the pregnancy?</p>
<p>4. SPECIFY OTHER RELATIONSHIP.</p>
<p>5. Did the mother of the baby seek antenatal care during the pregnancy?</p>
<p>5. Did you seek antenatal care during the pregnancy?</p>
<p>7. Is this a current pregnancy?</p>
<p>8. How did the pregnancy end?</p>
<p>9. In what month and year did the pregnancy end?</p>
<p>MM:</p>
<p>YYYY:</p>
<p>29. Has a sexual partner of yours been pregnant with any other children of yours (including pregnancies that are current or ended in stillbirth, miscarriage or abortion), since 2014?</p>
<p>29. Have you had any other pregnancies (including pregnancies that are current or ended in stillbirth, miscarriage or abortion) since 2014?</p>
<p>IF THERE IS ANY OTHER PREGNANCY since 2014 AND NOT LISTED HERE, CLICK "ADD GROUP" IN THE NEXT SLIDE.</p>
<p>IF NO OTHER PREGNANCY since 2014, CLICK "DO NOT ADD" GROUP IN THE NEXT SLIDE.</p>
<p>31. Do you have any biological children, born BEFORE January 2014, that we have not discussed just now? I know it may be difficult or upsetting, but please include children who are alive as well as children who were born alive but are no longer living now.</p>
<p>32. How many other biological children, born BEFORE January 2014, do you have – whether they are currently living or not?</p>
<p>33. How many of these children are currently living?</p>
<p>Additional comments?</p>

Section G - Credit
Savings and borrowing activities
READ: I would like to begin this section by asking you some questions about your savings activities.
1a. Do you use any mobile banking services, like M-Pesa, Airtel Money, or Equitel?
1b. Do you participate in a SACCO, merry-go-round, or ROSCA?
1c. Do you have a savings account in a formal bank?
READ: I would now like to ask you some questions about your borrowing activities.
1d. In the past 12 months, have you ever borrowed money either formally or informally? If so, from who did you borrow money?
1e. In the past 12 months, did you ever try to borrow money but were refused? If so, from who did you try to borrow money?
1f. Would you like to borrow more or are you happy with your current amount of borrowing?
Savings and borrowing amounts
READ: For the following questions, if you do not know the exact amount please guess what you think it is.
2a. What is the total amount in shillings in your mobile banking account right now?
2b. What is the total amount in shillings of SACCO / merry-go-round / ROSCA contributions that you made last month?
2c. What is the total amount in shillings in your bank account right now?
READ: I would now like to ask you some more questions about your borrowing activities.
2d. For what purpose did you take out your loans?
2e. What is the total amount that you borrowed from commercial banks or lenders in the past 12 months?
2f. What is the total amount that you borrowed informally from a friend or family member in the past 12 month in shillings?
2g. Why have you not had any loans in the past 12 months?
2h. If you could borrow more money in the next month, what would you use it for?
Additional comments?

Section C - Household and land characteristics
Household
NOTE: Please observe the materials of the floors, roof and walls, and record your observations in the following questions. Do not ask the respondent.
1a. What materials are the floors made of?
1b. What materials is the roof made of?
1c. What materials are the walls made of?
1d. What type of window coverings do you have?
READ: I would now like to ask you a few questions about your home. Please think of your current residence only (i.e. the main house of the compound or the building where you eat). We are only interested in the current residence, not (necessarily) ancestral land (even if the current residence is a rental).
1e. What kind of toilet facilities does your household use most often?
1f. Over the past 7 days, what was your household's main source of drinking water?
Household
1g. If floor material is other, please specify.
1h. If roof material is other, please specify.
1i. If wall material is other, please specify.
1j. If window coverings is other, please specify.
1k. If toilet is other, please specify.
1l. If drinking water is other, please specify.
Land ownership
READ: Thank you. I would now like to ask you about your land.
3a. Does your household own any land?
3b. Does your household rent-in any land?
3c. Does your household own or rent this house?
Landowner
4a. How much total land does your household own? In acres.
4b. How much of this land is used for agricultural purposes? In acres.
4c. Over the past 12 months, did you rent out any of your land to people outside your household?
Note that $c4b=c4a$ . Did you note that total land should include the boma?
Landowner
4d. How much of your land did you rent out? In acres.
4e. How much money do you receive each month for renting out this land?
Land renter
READ: You mentioned that you rent-in land. Over the past 12 months...
5a. ...how much land did you rent from others? In acres.
5b. ...how much of this land was used for agricultural purposes?
5c. ...for which months did you rent this land?
5d. ...how much did you pay in total to rent this land?
Home renter
READ: You mentioned that you rent this house.
6a. How much do you pay each month to rent this house?
When did you first begin renting this house?

6b. Select month.
6c. Select year.
Household assets
READ: How many of the following assets does your household own? Please think only of items that your household owns, and do not count items that are owned by other households in this compound. If an item is broken but you plan to fix it, please still include it.
7a. Bed
DO NOT READ ALOUD: There are \${hsize} members of the household, but only \${c7a} beds. Are you sure this is correct?
Household assets
7b. Bednet
7c. Kerosene stove
7d. Kerosene lamp
7e. Hoe
7f. Bicycle
7g. Motorcycle
7h. Car/truck
7i. Sofa pieces (all kinds)
Livestock
8a. Chickens
8b. Cattle
8c. Goats
8d. Pigs
8e. Sheep
Additional comments?

Section D - Agriculture
Activities
1a. What are the agricultural or pastoralist activities that members of your household perform?
Activities
1b. If other, please specify.
1c. What is the total size of the land that you use for all of these activities? In acres.
1d. For which activities are you the main decision maker?
Agriculture
READ: Thank you. I would now like to ask you a few details about the agricultural activities of your household.
2a. What are all of the crops that you grow?
Based on this list of crops, please identify up to three main crops that you grow.
2b. Crop #1.
2c. Crop #2.
2d. Crop #3.
2e. Over the past 12 months, did you use any of the following?
Agricultural labor
READ: Thank you. I would now like to ask you how much time you and members of your household spend on these agricultural activities. Over the past 7 days...
3a. ...how many hours did you work in total on these activities?
3b. ...how many hours did your spouse work in total on these activities?
READ: Over the past 6 months...
3c. ...how many members of your own household (including yourself) worked on these activities?
3d. ...how many workers from outside your household did you hire in total for these activities?
Income from agricultural activities
How much did your household receive in total in sales from selling crops...
4a. ...over the past month?
4b. ...over the past 12 months?
How much did your household receive in total in sales from selling livestock/ livestock products over the...
4c. ...over the past month?
4d. ...over the past 12 months?
Income from agricultural activities
How much did your household receive in total in sales from selling poultry/ poultry products over the...
4e. ...over the past month?
4f. ...over the past 12 months?
How much did your household receive in total in sales from selling fish over the...
4g. ...over the past month?
4h. ...over the past 12 months?
How much did your household receive in total in sales from selling your "other" activity over the...
4i. ...over the past month?
4j. ...over the past 12 months?
Additional comments?

Section K - Social Networks
READ: Now I want to ask about people you may know in your community. I will read out a list of people who live in this community. For each person, please tell me how you know the person and how many times you have visited their their home in the past 7 days.
NOTE: If the person lives in the same house as the respondent, please enter "97".
1. Which of the following people do you know?
READ: Now, for each of the following people, please tell me what your relationship is to the person.
Loop through each person
2. What is your relationship with \${this_name1101}?
2a. SPECIFY OTHER RELATIONSHIP:
3. In the past 7 days, how many times have you visited their home?
1. Which of the following people do you know?
READ: Now, for each of the following people, please tell me what your relationship is to the person.

Location

NOTE: You have reached the end of the main household survey. Please step outside and record the location of this main household.

Record your location.

The respondent earlier said that there are  $\{a19a\}$  Minor Households in this compound. Is this information correct given what they have told you throughout this survey?

If yes, please continue to complete one survey per Minor Household. If not, please go back and edit the relevant sections.

Minor Household Survey
Basic questions
NOTE: Please walk to a new Minor Household and begin a new Minor Household survey.
NOTE: If nobody who lives in this Minor Household is home, please ask the main respondent to do their best answering these questions.
READ: For these next questions, please think only of the people who regularly eat and sleep in this particular Minor Household. If there are any other Minor Households in this compound, we will ask about them later. Do not include anyone who regularly eats and sleeps in the Main Household
1a. How many people live in this particular Minor Household?
1b. How many people under the age of 18 live in this particular Minor Household?
1c. Is this Minor Household connected to the national grid?
Building quality
NOTE: Please observe the materials of the floors, roof and walls, and record your observations in the following questions. Do not ask the respondent.
1d. What materials are the floors made of?
1e. What materials is the roof made of?
1f. What materials are the walls made of?
1g. What type of window coverings do you have?
Building quality
1h. If floor material is other, please specify.
1i. If roof material is other, please specify.
1j. If wall material is other, please specify.
1k. If window coverings is other, please specify.
Main Minor Household Occupant details
READ: Please describe the main occupant (e.g. household head) of this particular Minor Household.
2b. Gender:
2c. Year of birth:
2d. Highest level of education completed:
2e. Current occupation:
2f. Currently employed or running own business?
2g. Relationship of Minor Survey respondent to the Main Household respondent:
Connected
3a. What type of electricity connection does this Minor Household have?
Connected
3b. If other, please specify.
3c. What electrical appliances are currently being used in this particular Minor Household? If an appliance is broken but you plan to fix it, please still include it.
3d. How much was invested in total in order to connect this particular Minor Household to electricity?
3e. How are you paying for your electricity?
3ei. If other, please specify.
Lighting energy
4a. In the past 7 days, how much money in total did the occupants of this Minor Household spend on kerosene?
4b. Is anyone currently using a solar lantern or solar home system in this particular Minor Household?

Location

NOTE: You have reached the end of this Minor Household survey. Please step outside and record the location of this minor household.

5a. Record your location.

5b. Please enter any additional important comments.

<b>Section Z</b>
<b>LSK 2016 - End time</b>
READ: Thank you very much for your time, all of this information will be kept strictly confidential. You will receive no direct benefits for having participated in this survey.
NOTE: Thank you for your hard work! You have reached the end of the survey. Please allow the respondent to continue with his or her day. Please fill in the remaining questions before exiting the compound.
<b>Comprehension and cooperation</b>
1a. Rate the comprehension level of the respondent:
1b. Rate the cooperation level of the respondent:
1d. Have you given your respondent a gift of appreciation?
1e. In what language did you use the Survey on your tablet today?
1f. What was the main language you used to communicate verbally with the respondent today?
1c. What language(s) is this respondent most comfortable with?
<b>Presence of others</b>
2a. Was anyone else present during the interview?
<b>Presence of others</b>
2b. What is the name of this person?
2c. Did this person assist the respondent with his/her answers?
<b>Survey information</b>
4a. Please enter your IPA ID number:
4b. Transformer ID:
4c. Household ID:
<b>Qualitative questions</b>
NOTE: Please now enter the responses to the qualitative questions. Please record as many details as possible.
4n. What are the best things about having an electricity connection?
4o. What are the worst things about having an electricity connection?
4p. How has electricity impacted your life?
3d. What are the best things about having an electricity connection?
3e. What are the worst things about having an electricity connection?
3f. If you had electricity, how do you think it would impact your life?
3g. What are the good or bad things about your neighbor having an electricity connection?
<b>Comments</b>
NOTE: Earlier, this household said that they were not living in this same house two years ago, in 2014. Please ask them to guide you to their old house, if it is in this community.
If a new family is living in their old house, please complete a full spillover survey. Please use "98" or "99" as the household ID.
If not, please complete a missing household survey.
<b>Comments</b>
5. Please enter any additional important comments.
Has this survey been double checked?

## **Note on data management/access and pre-analysis plan**

Date: May 16, 2016

On May 17, 2016, we will launch a follow-up survey round to measure the social and economic living standards of roughly 4,000 households in our sample of communities in Western Kenya.

As of May 16, 2016, we have not filed our pre-analysis plan outlining the key research questions, outcomes, and estimating equations related to our study on the social and economic impacts of rural electrification. The pre-analysis plan will be prepared by Kenneth Lee, Edward Miguel, and Catherine Wolfram, with assistance from Susanna Berkouwer, and will be uploaded to the AEA RCT Registry at a future point in time, possibly in late-July.

In general, survey data will be compiled, organized, and stored by the field management team based in Busia, Kenya. During the first few weeks of data collection, this team, consisting of Eric Hsu, Charles Amuku, and Emma Smith, will prepare and provide Kenneth Lee, Edward Miguel, Catherine Wolfram, and Susanna Berkouwer with access to de-identified survey data for up to 10% (i.e., 400 surveys) of the total surveys. This data will also be stripped of any indicators that may expose the treatment status of households.

This initial access will be provided in order to:

1. Identify and correct any coding errors in the survey instrument that are causing certain questions to be skipped.
2. Make improvements to the choice sets for multiple-choice questions, to better reflect the types of answers that are provided on the ground.
3. Identify and amend questions that are taking too much time and, as a result, are creating delays.
4. Identify and address any other technical issues with the survey instrument.
5. Make any final additions to the survey instrument to address minor questions.

Full access to the dataset will be provided to all research team members once the pre-analysis plan has been filed on the AEA RCT Registry, possibly in late-July.



KEN LEE &lt;kennethlee@berkeley.edu&gt;

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## Important - Note for RCT Registry

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**Charles Amuku** <camuku@poverty-action.org>  
To: Ken Lee <kennethlee@berkeley.edu>  
Cc: Emma Smith <esmith@poverty-action.org>

Mon, May 16, 2016 at 10:33 PM

Dear Ken,

I confirm that I have read the note on data management, access, and the pre-analysis plan, dated May 16, 2016, and agree to follow the specified plan.

Charles Amuku  
Research Associate,  
Innovations for Poverty Action - Kenya

[Quoted text hidden]

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**[Charles Amuku, Research Associate, Innovations for Poverty Action – Kenya.](#)**

**Address:** 373-50400

Along Kisumu-Busia Road, Busia.

**Phone ;** +254 726 965 560 OR +254 734 820 040,

**Website:** [www.poverty-action.org](http://www.poverty-action.org), **Email:** [camuku@poverty-action.org](mailto:camuku@poverty-action.org)

**Skype:** amukucharles\_1



KEN LEE <kennethlee@berkeley.edu>

## Important - Note for RCT Registry

Susanna Berkouwer <berkouwer@berkeley.edu>  
To: Ken Lee <kennethlee@berkeley.edu>

Mon, May 16, 2016 at 10:11 PM

Hi Ken,

I confirm that I have read the note on data management, access, and the pre-analysis plan, dated May 16, 2016, and agree to follow the specified plan.

Susanna Berkouwer  
PhD Student, GSR  
AEARCTR-0000350

On Mon, May 16, 2016 at 5:27 PM, Ken Lee <kennethlee@berkeley.edu> wrote:

Hi all,

This is very important. We need to upload a statement to the RCT Registry to specify how we will handle data sharing in the period before our pre-analysis plan is registered. Can each of you please read the attached statement and email me back, copying and pasting the statement below? All of our statements need to be uploaded to the Registry by the end of the day. This is very time-sensitive. Thank you,

Ken

////////////////////////////////////

I confirm that I have read the note on data management, access, and the pre-analysis plan, dated May 16, 2016, and agree to follow the specified plan.

[Name]  
[Title]  
AEARCTR-0000350



**KEN LEE** <kennethlee@berkeley.edu>

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## Important - Note for RCT Registry

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**Eric Hsu** <ehsu91@gmail.com>

Mon, May 16, 2016 at 5:32 PM

To: Ken Lee <kennethlee@berkeley.edu>

I confirm that I have read the note on data management, access, and the pre-analysis plan, dated May 16, 2016, and agree to follow the specified plan.

Eric Hsu  
Research assistant  
AEARCTR-0000350

[Quoted text hidden]

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Eric Hsu  
Ph.D. Student  
Economics Department  
University of California, Berkeley



**KEN LEE** <kennethlee@berkeley.edu>

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## Important - Note for RCT Registry

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**Ken Lee** <kennethlee@berkeley.edu>  
To: KEN LEE <kennethlee@berkeley.edu>

Mon, May 16, 2016 at 5:28 PM

I confirm that I have read the note on data management, access, and the pre-analysis plan, dated May 16, 2016, and agree to follow the specified plan.

Kenneth Lee  
PhD candidate, UC Berkeley  
AEARCTR-0000350



KEN LEE <kennethlee@berkeley.edu>

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## Note on data management, access and the pre-analysis plan for the Rural Electrification Project

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Edward Andrew MIGUEL <emiguel@berkeley.edu>

Mon, May 16, 2016 at 9:44 PM

To: Kenneth Y Lee <kennethlee@berkeley.edu>

Cc: Catherine Wolfram <cwolfram@berkeley.edu>

I confirm that I have read the note on data management, access, and the pre-analysis plan, dated May 16, 2016, and agree to follow the specified plan.

Edward Miguel  
Professor of Economics, University of California, Berkeley  
AEARCTR-0000350

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Edward Miguel  
Department of Economics  
University of California, Berkeley

**KEN LEE** <kennethlee@berkeley.edu>

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## Important - Note for RCT Registry

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**Emma Smith** <esmith@poverty-action.org>  
To: Charles Amuku <camuku@poverty-action.org>  
Cc: Ken Lee <kennethlee@berkeley.edu>

Tue, May 17, 2016 at 3:50 AM

Dear Ken,

I confirm that I have read the note on data management, access, and the pre-analysis plan, dated May 16, 2016, and agree to follow the specified plan.

Emma Smith  
Research Associate, Innovations for Poverty Action

[Quoted text hidden]



**KEN LEE** <kennethlee@berkeley.edu>

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## REPP data collection protocol

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**Catherine Wolfram** <cwolfram@berkeley.edu>

Mon, May 16, 2016 at 2:44 PM

To: Ken Lee <kennethlee@berkeley.edu>

Hi Ken-

I confirm that I have read the note on data management, access, and the pre-analysis plan, dated May 16, 2016, and agree to follow the specified plan.

Catherine Wolfram  
Cora Jane Flood Professor of Business Administration  
AEARCTR-0000350



KEN LEE <kennethlee@berkeley.edu>

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## Note on data management, access and the pre-analysis plan for the Rural Electrification Project

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Catherine Wright <cwright@berkeley.edu>  
To: KEN LEE <kennethlee@berkeley.edu>

Thu, Jul 14, 2016 at 12:47 PM

Hi Ken,

I confirm that I have read the note on data management, access, and the pre-analysis plan, dated May 16, 2016, and agree to follow the specified plan.

Catherine Wright  
Research Assistant  
AEARCTR-0000350