MECS
Modern Energy Cooking Services

Electric Cooking Outreach (ECO) webinar series: research methods and tools

Webinar 3: Data collection

Loughborough University

ESMAP
Energy Sector Management Assistance Program

UKaid
from the British people

This webinar covers

- Cooking Diary types
- Four phases of data collection: baseline, transition, monitor and endline
- Recording energy measurements data
- Recording cooking processes data
- Electric cooking training for participants
- Data verification
- Exit surveys
- eCooking challenge

Cooking Diaries Types

There are two types of cooking diaries:

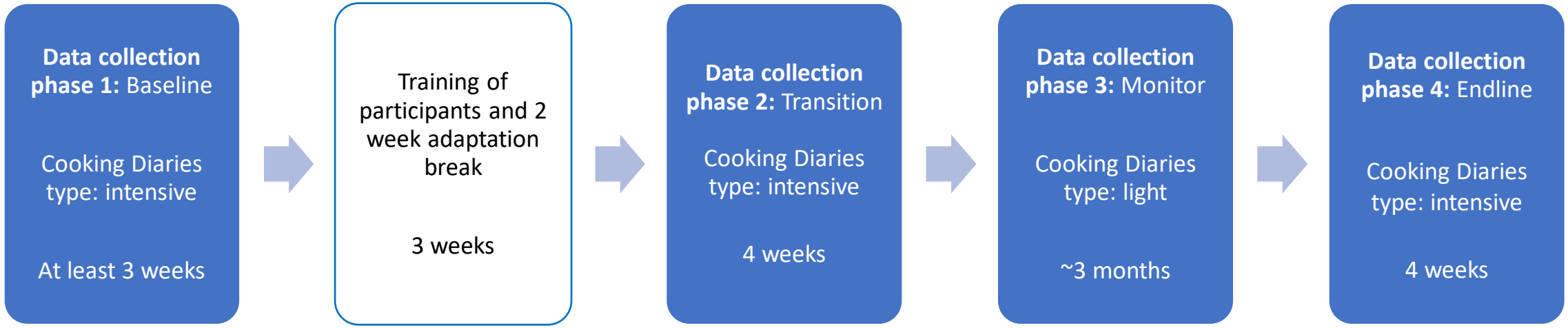
Intensive

- All cooking events on any stove
- Times of cooking events
- Menu items cooked
- Detailed data on who was cooked for
- Detailed cooking process data

Light

- Only cooking events on electric cooking appliances
- Time electric appliance was used
- Menu item cooked
- Number of people cooked for

Four phases of data collection



Data collection phase 1: Baseline

Purpose: to know how people cooked before the ECO pilot began

Cooking Diaries type: intensive

Duration: at least 3 weeks

- Without a baseline, we cannot say with accuracy what the existing cultural cooking processes and their energy requirements were before the pilot began and therefore whether electric cooking fits these processes/requirements or what effect electric cooking has on cooking practises.
- We therefore cannot answer the ECO research questions **'Does the use of efficient electrical cooking appliances fit the cultural processes of cooking and the electricity supply for a given market?'**.
- Key information to learn from the baseline cooking diary: the menu, appliances/fuels used, energy measurements, use of fuel stacking, and cooking processes and times

Participant roles

- Should not change anything about how they cook
- Record energy and time measurements on the notepad form – must do this, numbers are very easy to forget!

Enumerator roles

- Daily visits to 5 households
- Input data from the participant notepad form onto KoboToolbox
- Interview participants about how and what they cooked and input onto KoboToolbox
- Upload KoboToolbox data to the server and check data with lead researcher.
- Take pressure and effort off the participants!

Recording energy measurements data

Purpose: to record the energy used to cook

Method:

- Participants record cooking times and energy measurements on notepad form.
- Enumerators then transcribe this data onto KoboToolbox

Charcoal/firewood/kerosene: weigh before and after each **meal** using hanging or flat scales

LPG: weigh before and after each **meal** using flat scales

Electricity used per dish: use plug-in energy meters

- Zero plug-in meter before starting each **dish** and record value after finishing each dish.
- Use individual meters for each appliance but if multiple appliances are used to prepare a single dish, ensure each appliance is plugged into the same meter in turn.

Electricity - continuous load profile: use dataloggers

- current and voltage should be recorded separately as supply voltage has a dramatic effect on the speed of cooking and the functionality of any electronic control systems

Digital hanging scales (left) and flat scales (right).
See p.46 of the Protocol V3.0 for further details

Participants in Kenya recording dish level data with individual meters for each appliance

Recording cooking processes data

Purpose: to understand how food is cooked/cooking practices.

Method: enumerators conduct daily interviews asking ***how*** participants cooked previous day's meals and record data on KoboToolbox

Data captured includes:

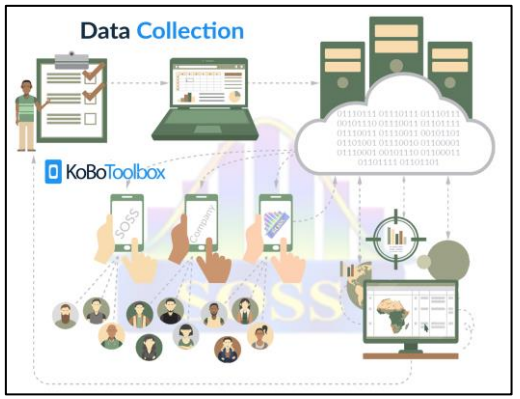
- purpose of the cooking event (e.g. lunch, dinner, heating water) and number of people catered for
- What menu item was cooked
- whether the food is being cooked from fresh or simply reheated
- whether food is being saved for later - e.g. batch cooking, storing and frying individual portions at a later date
- appliances and utensils used

FAQ. How will participants be able to remember all these details?

Example KoboToolbox cooking diary questionnaires available on the ECO shared folder

Data verification during data collection

- Enumerators to monitor and make sure participants are recording data correctly during cooking diaries study.
- Using KoboToolbox allows the data to be verified as the study is in progress by:
  - allowing the lead field researcher/data analysis specialist to review the data
    - small data collection errors can then be amended
    - any omissions/suspicious data can often be added/corrected when the enumerator returns to the household the next day.
  - defining specific ranges for numerical responses, numbers of responses for multiple choices, etc
- We suggest KoboToolbox (or similar digital system) as a paper based data entry system is:
  - very time consuming and laborious
  - increases scope for errors. E.g. a sample of 50 participants recording five cooking events a day over a month generates 7,500 records.



The KoboToolbox digital platform

Electric cooking training for participants and adaptation break

Purpose: to train participants in the new appliances and allow participants time and space to adapt to and experiment with the appliances.

Duration: 3 week (1 week training + 2 weeks adaption break)

Training

- Enumerators bring together 5 participants for a participatory cooking session to cook at least one dish from each of the previously established dish categories
- Each appliance should have an energy meter on it and the enumerator should demonstrate how to measure electricity consumption.
- Enumerators should highlight that energy measurements should be taken for each dish (not each meal).
- Training should cover basic electrical safety and key safety features of EPCs/appliances

Adaptation break

- Participants will need time and space to adapt to and experiment with the appliances. Enumerators should be contactable to assist with questions.
- Increases likelihood of better quality data when phase 2 begins

An enumerator training a participant on electric appliances and plug-in energy meters in Tanzania

Data collection phase 2: Transition

Purpose: collect data on how people cook after electric appliances are introduced

Cooking Diaries type: intensive

Duration: 4 weeks

- Same activities as with ‘phase 1 baseline’ but participants now have the option to use the new electric appliances
- Participants do not have to use the electric appliances for all foods cooked
- Enumerators continue to make daily visits to 5 households to input notepad data onto KoboToolbox and interview participants on how they cooked
- Enumerators need to be polite, supportive and encouraging to participants

Data collection phase 3: Monitor

Purpose: monitor electric cooking use in a less intensive and demanding way for participants and enumerators

Cooking Diaries type: light

Duration: 3 months

Data monitored: (recorded by participants on notepad)

- when electric cooking appliances are switched on/off
- reason for cooking (breakfast, lunch, snack, boil water for tea etc)
- what menu item is cooked on the electric appliances
- how many people were cooked for

Enumerator roles:

- Visit once/twice a week to upload data recorded by participants onto KoboToolbox
- Support participants and troubleshoot

Mid-phase intervention: Halfway through phase 3 hold a meeting(s)/workshop(s) with participants to:

- see how things are going (e.g. are participants still using electric appliances, why?/why not?),
- offer support, find out what could help participants with the study
- provide an **opportunity for intervention** – e.g. could particular training overcome certain barriers?

Data collection phase 4: Endline - the new kitchen routine

Purpose: record cooking diaries and energy measurements data for a final 4 weeks, with participants cooking as they please to find out how the new appliances fit into their 'real' kitchen routines

Cooking Diaries type: intensive

Duration: 4 weeks

Activities: same as with 'phase 2 transition'

Concluding the study: Exit surveys

Purpose: to obtain qualitative feedback on participants' experiences of cooking with electricity and to inform future studies

Start point: during the week after phase 4 data collection ends

Time required: several hours per participant

Questions typically include: user experience of electric appliances, design of appliances, taste of food cooked with electric appliances, comparison with other fuels

Example paper based exit survey available from the ECO shared folder and Appendix D of the eCook Kenya Cooking Diaries working paper: https://mecs.org.uk/wp-content/uploads/2019/09/eCook-Kenya-Cooking-Diaries-September-2019-Working-Paper.pdf

Optional. Concluding the study: the eCooking challenge

- Participants invited to share energy-efficient cooking practices in an eCooking Challenge which involves seeing who can cook a particular dish with as little as energy as possible
- Energy-intensive dishes are good choices as the effect of energy saving practices is far more visible.
- Observational study: enumerators observe and record plug-in energy meters and participant cooking practices (including any specific energy saving techniques) to understand exactly where energy is being saved/wasted
- In Kenya, a prize eCook was offered to the participant who cooked half kg of githeri (boiled maize and legumes) using the least energy
- **Benefits:** adds greater depth to the data from the Cooking Diaries on how a particular dish is cooked while also helping to triangulate findings.

Further option: Understanding cooking processes + tips for energy saving can help create an energy-saving eCookBook. For examples, see ECO shared folder or https://mecs.org.uk/download-category/ecookbook/

An enumerator observing the participant during the Githeri eCooking Challenge in Kenya

Example eCookbooks

KoBoToolbox Resources

In the ECO shared folder:

- Registration kobo survey: *'Registration survey form Gamos 15.07.20.xlsx'*
- Intensive diary kobo survey: *'Cooking Diaries Form Gamos 26.8.20.xlsx'*
- Light diary kobo survey: *'Cooking Diaries Light Form Gamos 17.07.20.xlsx'*
- *User guide – Kobo Toolbox Survey Notes*

https://support.kobotoolbox.org/