



Covenant of Mayors
in Sub-Saharan Africa

CoM SSA SEACAP Toolbox

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Author: ICLEI Africa

The full SEACAP Toolbox is found here: <https://comssa.org/>



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CoM SSA SEACAP Toolbox

3.2 SEACAP Planning:

Phase 2.1: Energy Access Data Collection

This chapter is one component of the SEACAP Toolbox for the full Toolbox, please visit: <https://comssa.org/>

What you will learn in this chapter:

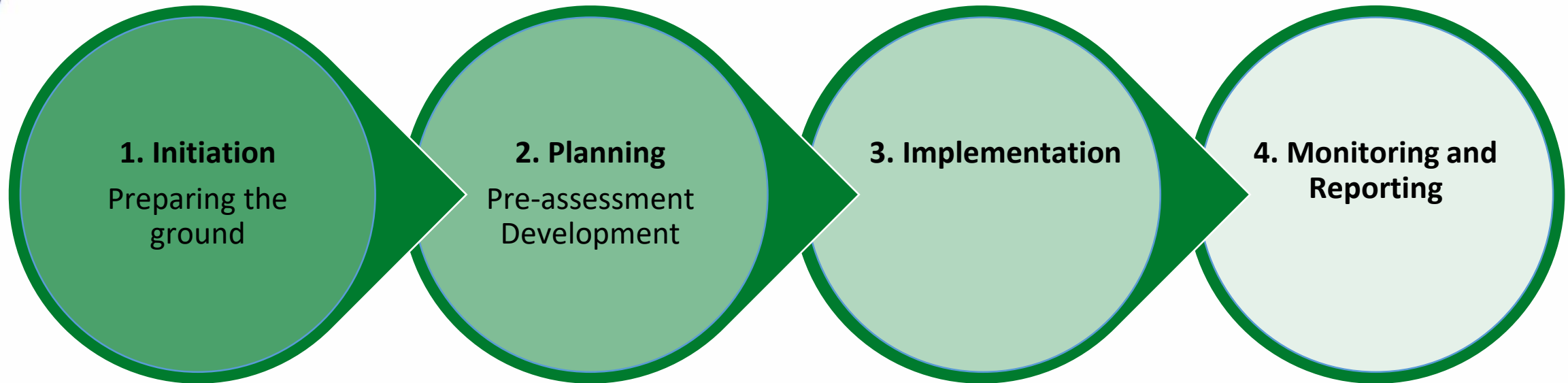
- The 3 steps of how to conduct an Access to Energy Assessment
- Data collection methods and sampling techniques
- Data collection tools in the toolbox
- Inclusions for Energy Access Assessment Report

This chapter has been designed for Local Government Officials and partners completing a SEACAP.



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PHASES OF DEVELOPING THE SEACAP



Phase 2: THE PLANNING PHASE OF THE ACCESS TO ENERGY PILLAR



Phase 2.1: Developing the Access to Energy Assessment



**2.1. ACCESS TO
ENERGY
ASSESSMENT**



Access to Energy Assessment:

What is an Access to Energy Assessment?

“Access to energy assessment (AEA) is developed as a dashboard of multiple indicators that help to figure out a clear picture of the current condition of the local authority”



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Access to Energy Assessment:

Why conduct an Access to Energy Assessment?

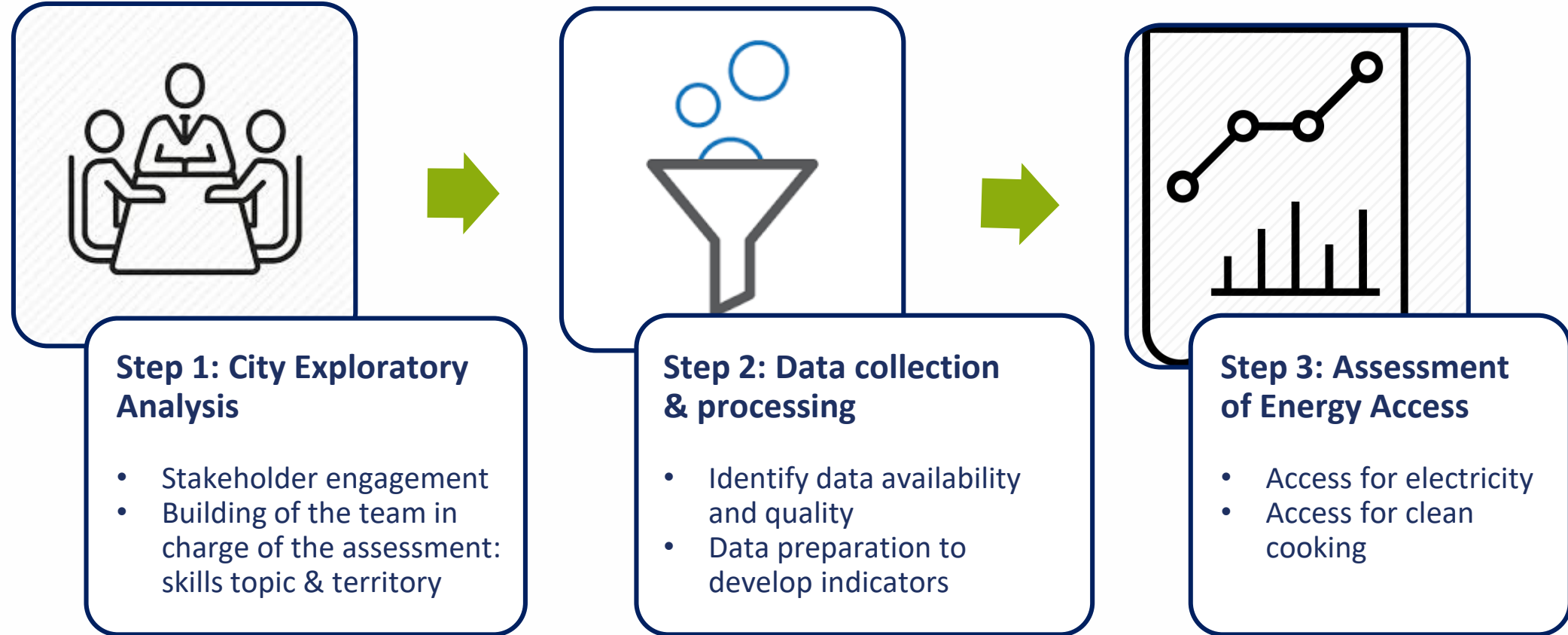
- Helps to improve the local governments' image,
- Points out areas to reduce energy consumption costs as well as impacts related to CO2 emissions.
- Makes the city more attractive to international donors and investors, when good financial figures are included for the implementation of the identified actions.



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ACCESS TO ENERGY ASSESSMENT:

Access to Energy Assessment Steps:



STEP 1 OF ACCESS TO ENERGY ASSESSMENT:

City Exploratory Analysis



Step 1: City Exploratory Analysis

- Stakeholder engagement
- Building of the team in charge of the assessment: skills topic & territory



Step 2: Data collection & processing

- Identify data availability and quality
- Data preparation to develop indicators



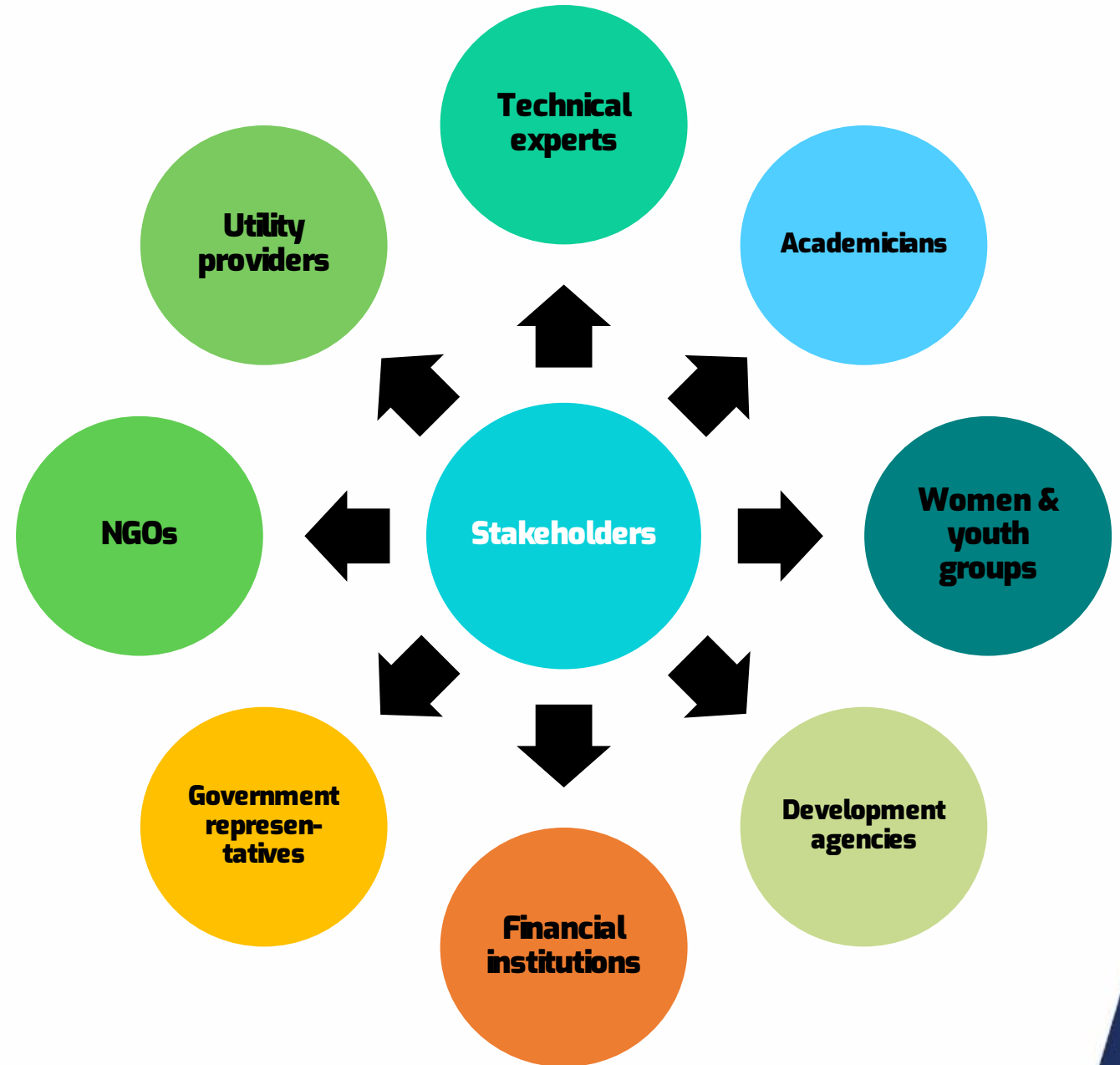
Step 3: Assessment of Energy Access

- Access for electricity
- Access for clean cooking

City Exploratory Analysis:

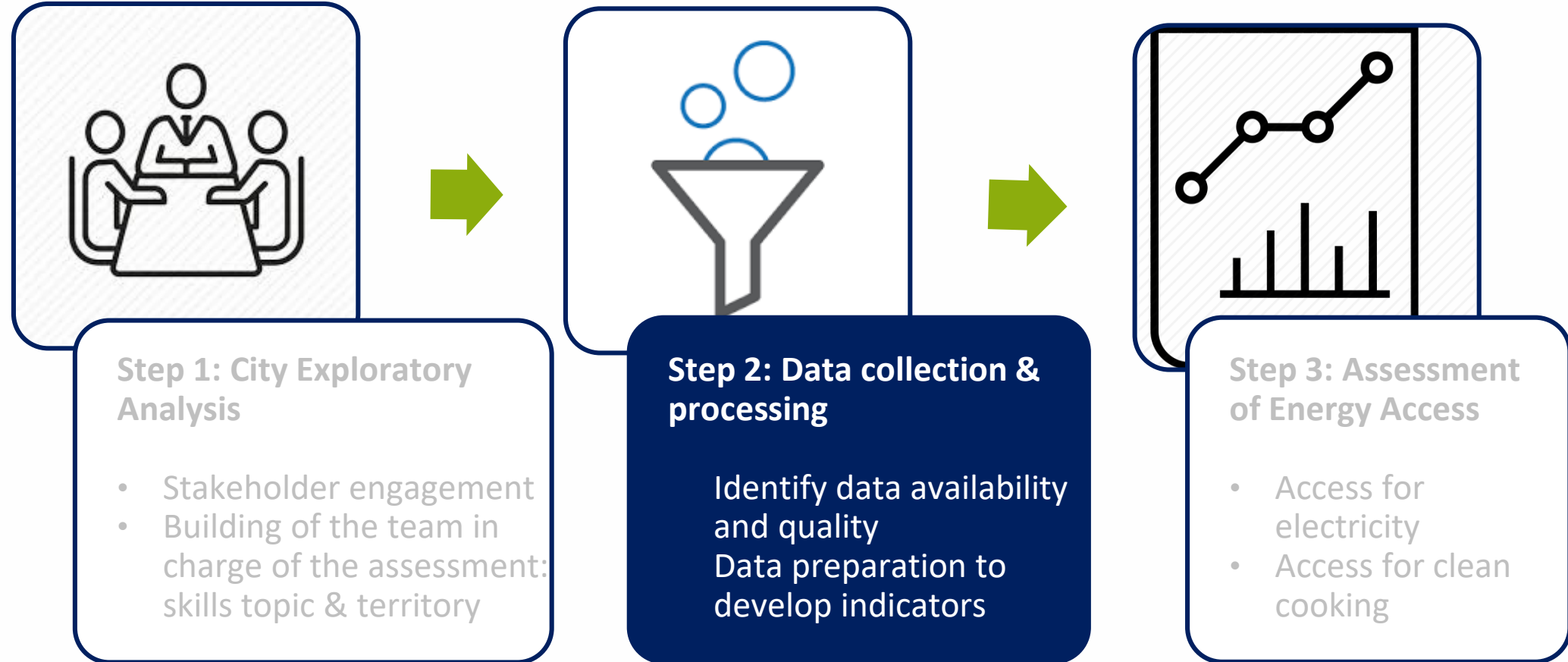
Stakeholder engagement

Stakeholder engagement is key



STEP 2 OF ACCESS TO ENERGY ASSESSMENT:

DATA COLLECTION



DATA COLLECTION

What is Data & data Collection?

- Data are facts and statistics collected together for reference or analysis.
- Data collection is a systematic process of gathering observations or measurements.
- It could be quantitative or qualitative



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Data Collection Types:

Qualitative data collection:

- Deals with non-numerical factors and aims to assess factors like the thoughts and feelings of research participants.

Examples include:

- Interviews
- Focus groups
- Observations
- Oral history

Quantitative data collection:

- Relatively straightforward and deals with something that can be counted and analysed statistically
- Easier for respondents due to closed-ended questions
- Suitable for a large scale of respondents

Examples include:

- Questionnaires
- Records

DATA COLLECTION

Top data collection methods:



Primary and secondary data collection methods:

1. Interviews
2. Questionnaires and surveys
3. Observations
4. Documents and records
5. Focus groups
6. Oral histories

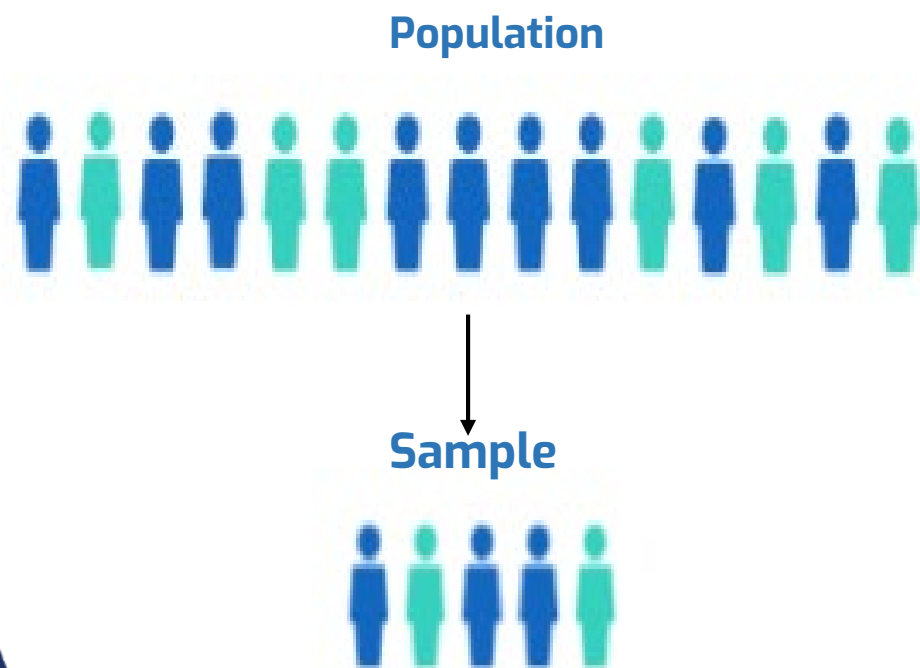


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SAMPLING TECHNIQUES FOR PRIMARY DATA COLLECTION

WHAT IS SAMPLING?

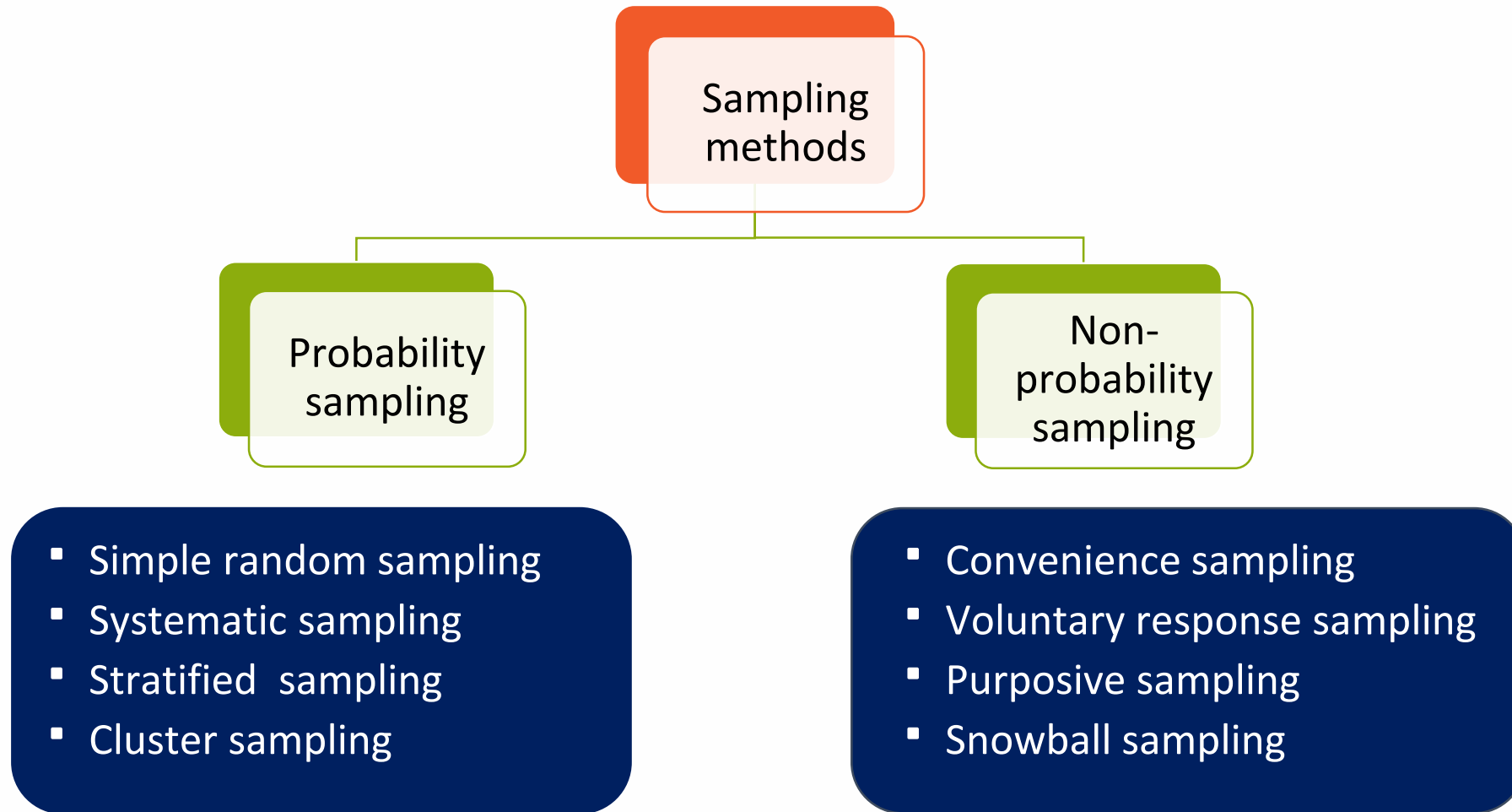


Sampling is the process of identifying a subset of a population that provides an accurate reflection on the whole population.

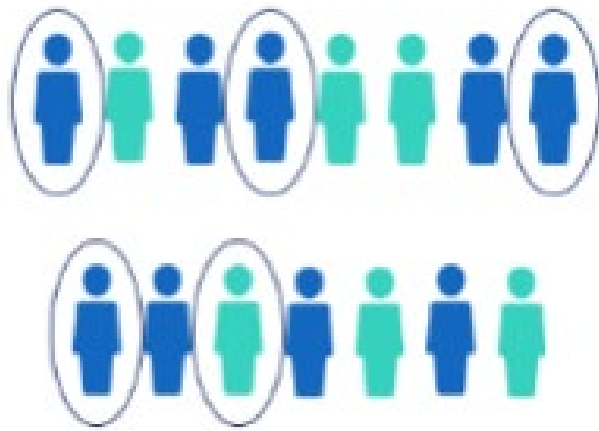


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SAMPLING METHODS



i) Simple random sampling



Involves picking respondents with no design or order

Pros: eliminates bias

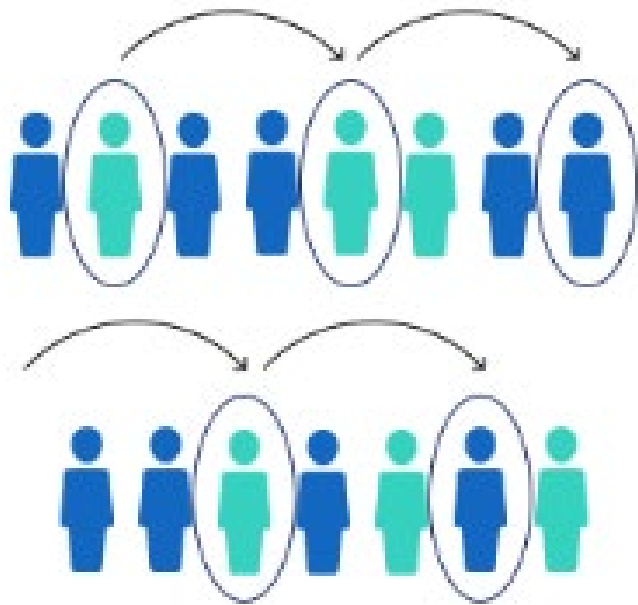
Cons: requires some planning

Example: using a random number generator to generate 100 households out of a total of 1000 households



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ii) Systematic sampling



Follows a set of rules to create regularity in sampling

Pros: easier than random sampling and retains some benefits of randomness

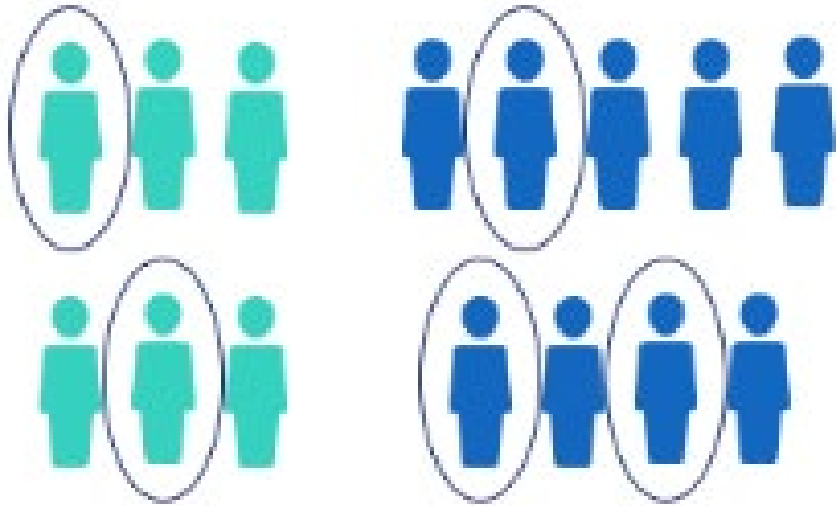
Cons: data may skew in one way or the other and prone to bias

Example: interviewing every tenth customer. The bias may be that every 10th customer is female



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iii) Stratified sampling



Involves dividing population into sub-groups that share similar characteristics

Pros: reduces bias

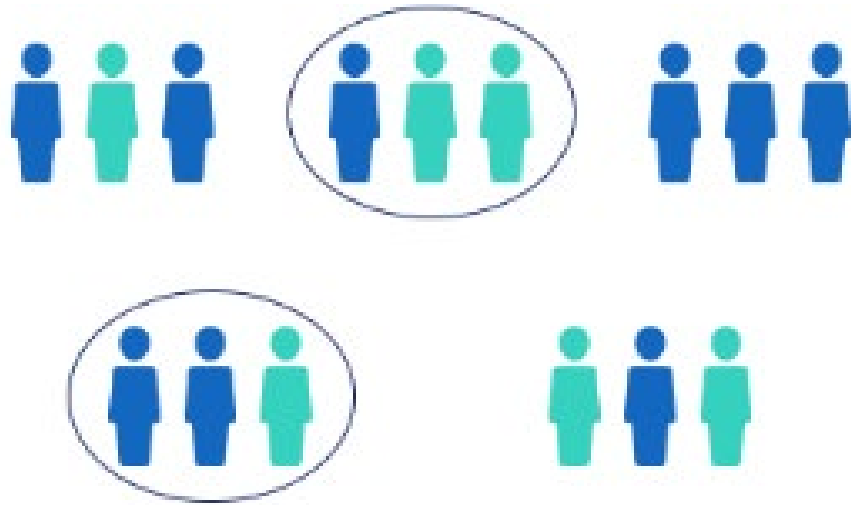
Cons: characteristics can sometimes be difficult to determine, which can invite bias

Example: breaking down a population by age or by gender, income groups...



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iv) Cluster sampling



- Using sub-groups of populations rather than individuals, with predefined clusters
- Two types: single stage cluster (all individuals in the cluster are included) and two-stage cluster (only random individuals in the cluster are chosen)
- Pros: some work has already been done as a group has been defined
- Cons: potential for bias if clusters do not accurately represent the whole population
- Example: choosing a municipality to represent the national population



SAMPLE SIZE:

How big should the sample size be for quantitative data?



POPULATION	SAMPLE SIZE	PERCENT REQUIRED
10	10	100
20	19	95
50	44	88
100	80	80
250	152	61
500	217	43
1,000	278	28
2,500	333	13
5,000	350	7
10,000	370	4

From Krejcie, R.V., and Morgan, D. E. (1970). Determining sample size for research activities. Educational and Psychological Measurement, 30(3): 607-610.



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Possible sample sizes for some cities:

**10 data collectors can spend
8 days to survey 400
households in Bobo**

Assumptions:

- 1 hour spent in a HH per enumerator
- 5 HHs surveyed per day per enumerator
- In addition, 2 weeks for back-checks and data validation

City	Population	Number of HHs	Sample size
Garoua	500,000	125,000	383
Nakuru county	2,000,000	500,000	384
Bobo Dioulasso	1,000,000	250,000	384





DATA COLLECTION TOOLS IN THE SEACAP DEVELOPMENT TOOLBOX

DATA COLLECTION TOOLS IN THE TOOLBOX:

Different tools:

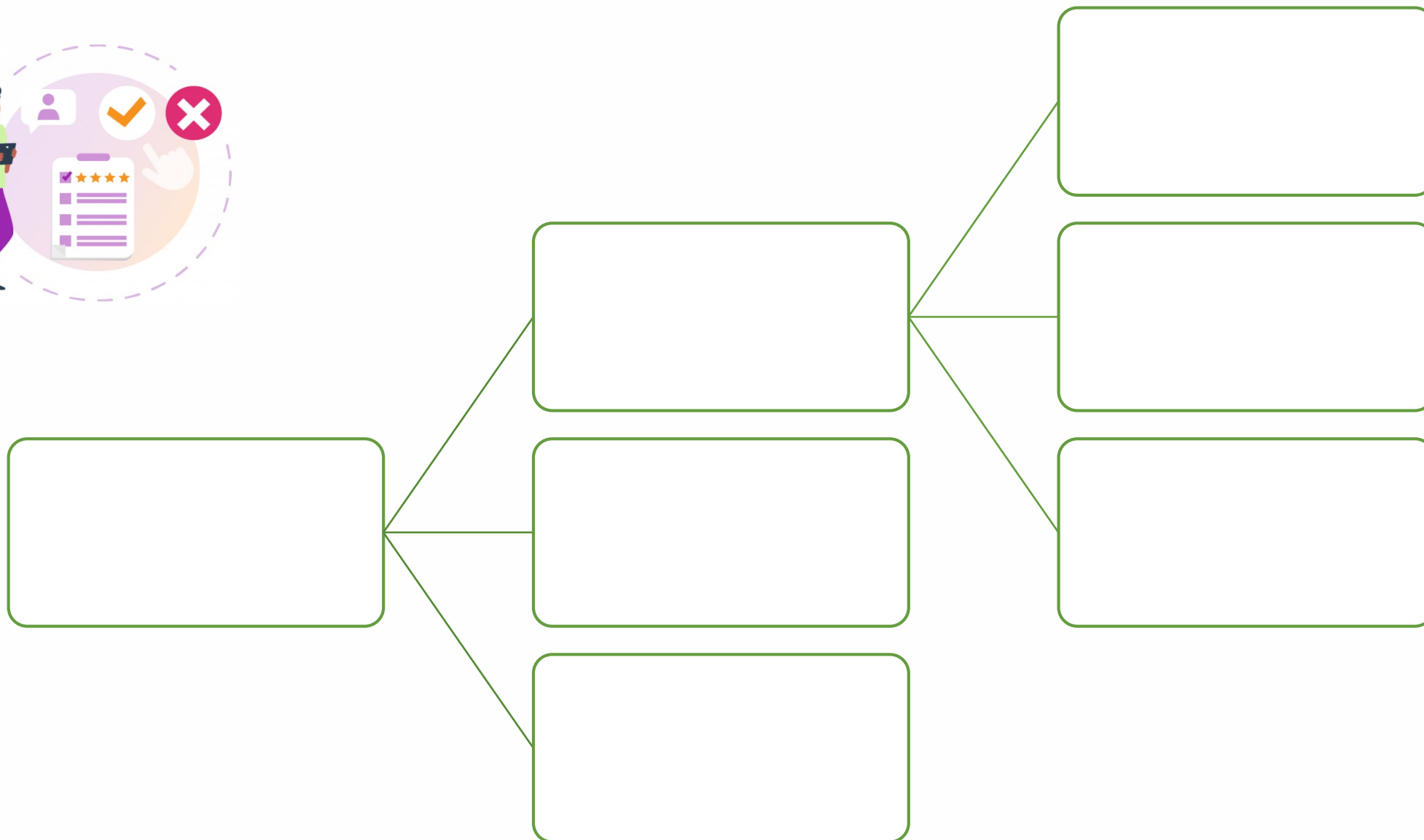
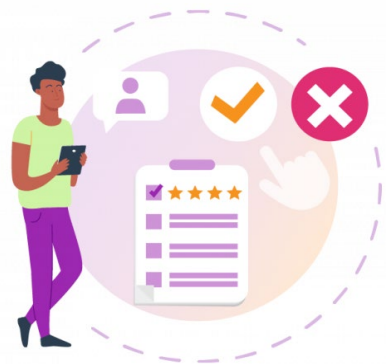


- Excel-based Access to Energy Questionnaire
- Digitised access to energy questionnaire - KoBo Toolbox
- A data collection guide for enumerators and supervisors
- Others: consent form, NDA, interview tracking form...



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The CoM SSA Questionnaire



i). Excel-based data collection sheet

Contains sheets on:

- Income,
- demographics,
- clean cooking,
- electricity, LPG,
- mitigation etc.
- and a response matrix

Variable	Questions on Household Income									Response	Enumerator Note	Analysis point
Household income	What is the main source of income for this household?									Employment part time		To determine main source of income
	Employment full-time	Employment part time	Self-employed	Pension income	Student grant	Disability grant	No income, unemployed	Other (specify).....				
Work type	What type of work do they do?											To determine the sector income is reliable on
	Farming	Fishing	Personal services	Corporate services	Domestic work	General laborer						
Income amount	How much do they make from this per month?										Click and enter a value from range Income!D6:I6	Amount of income to be compared to expenses as a measure of affordability
	800											
Other income through employment	Does anyone else in this household make money through employment?											Determine other sources of income through work and dependency on sector
	Yes	No										
Number of employed hh member	How many people in this house are employed?											Household employment rate and dependency on main income source and
	8											
	What sector do they work in?											

Demographics
Income
Clean Cooking
Energy services and appliances
Electricity
LPG
...

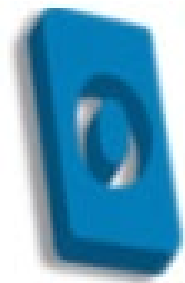
i). Excel-based data collection sheet:

Survey Response matrix

Q #	Variable	Response	Q #	Variable	Response
Clean Cooking			LPG		
28	Stove type	Gas stove	62	Use of gas	Yes
34	Firewood use	0	63	reason for non use of gas	It smells
35	Firewood distance	0	64	Willingnes to use gas	Yes
36	Firewood frequency	0	65	Willingness to pay for gas	Same as my current fuel cost
37	Firewood duration	0	66	Frequency of use of gas	0
Electricity					
40	Electricity connection	Yes	0	Cooking	3-4 times a week
			0	Lighting	Daily
41	Reason for no connection	0	0	Heating	3-4 times a week
42	Willingness to pay for electricity	Yes	0	Cooling	3-4 times a week
	Frequency of use of electricity		0	ITC	3-4 times a week

ii. Digital data collection

Using KoBo Toolbox:



KoBoToolbox

OPEN SOURCE DEVELOPMENT SUPPORTED BY



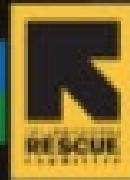
HARVARD
HUMANITARIAN
INITIATIVE



BRIGHAM AND
WOMEN'S HOSPITAL

WITH ADDITIONAL SUPPORT FROM

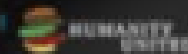
MacArthur
Foundation



TIDES
WATER DOCTRINE

Conrad N. Hilton
FOUNDATION

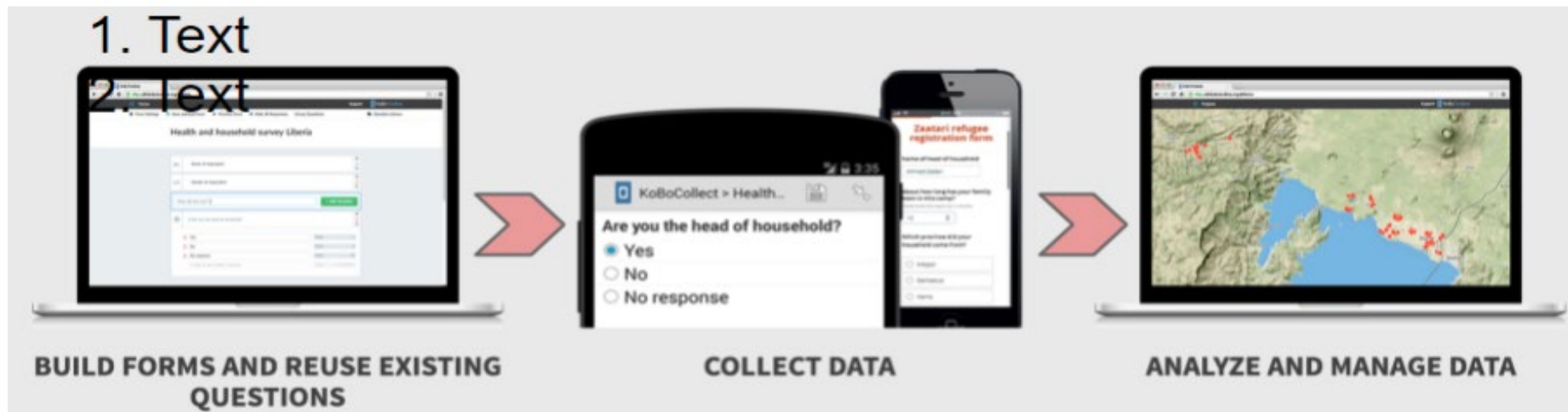
FIDELITY FOUNDATION
Transitioning to Water for People since 2017



KoBoToolbox:

Overview:

- Ability to create, record, collect and analyse data
- No internet connection required during data collection
- Data can be collected using internet browser or **KoBo Collect** on Android devices
- Ability to use browser or Android data collection app



KOBO TOOLBOX:

Pros and cons:

Cons:

- Photos and media files download as separate Zip files, not linked as online files
- Download file limits
- Some server limitations (except for humanitarian organisations)



Pros:



- The tool is free
- Possibility to use multiple languages
- Easy form creation but also uses more advanced XLS Forms
- Works offline
- Collects GPS coordinates
- Exports as KML, XLS and CSV
- Administrator's tools for coordinating field workers
- Humanitarian organizations can use the server hosted with no restrictions on the number of submissions

KOBO TOOLBOX:

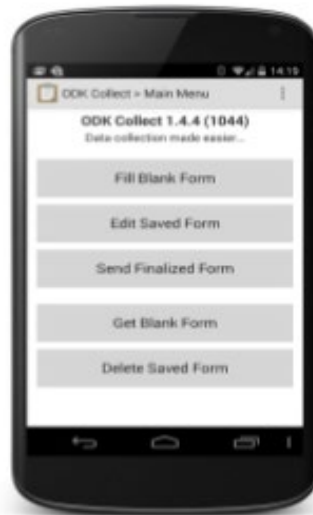
Work flow for field data collectors:

Install apps on
device

Download
form for data
collection

Collect data in
the field

Submit data to
specified
platform



Data collection in Bobo, Burkina Faso, October 2020

KOBO TOOLBOX:

Sample questions in the digital Kobo questionnaire

GPS coordinates of house

latitude (x,y °)

longitude (x,y °)

altitude (m)

accuracy (m)



*** House address (suburb)**

search for place or address



© OpenStreetMap & Yohan Boniface & Humanitarian OpenStreetMap Team | Terms

» » SUMMARY OF FUELS USED FOR DIFFERENT END USES IN THE HOUSEHOLD

***What is the main fuel you used by your household for cooking?**

- ☐ Electricity
- ☐ solar energy
- ☐ LPG
- ☐ Charcoal
- ☐ firewood
- ☐ Paraffin
- ☐ Biogas
- ☐ Briquette
- ☐ Other (specify)

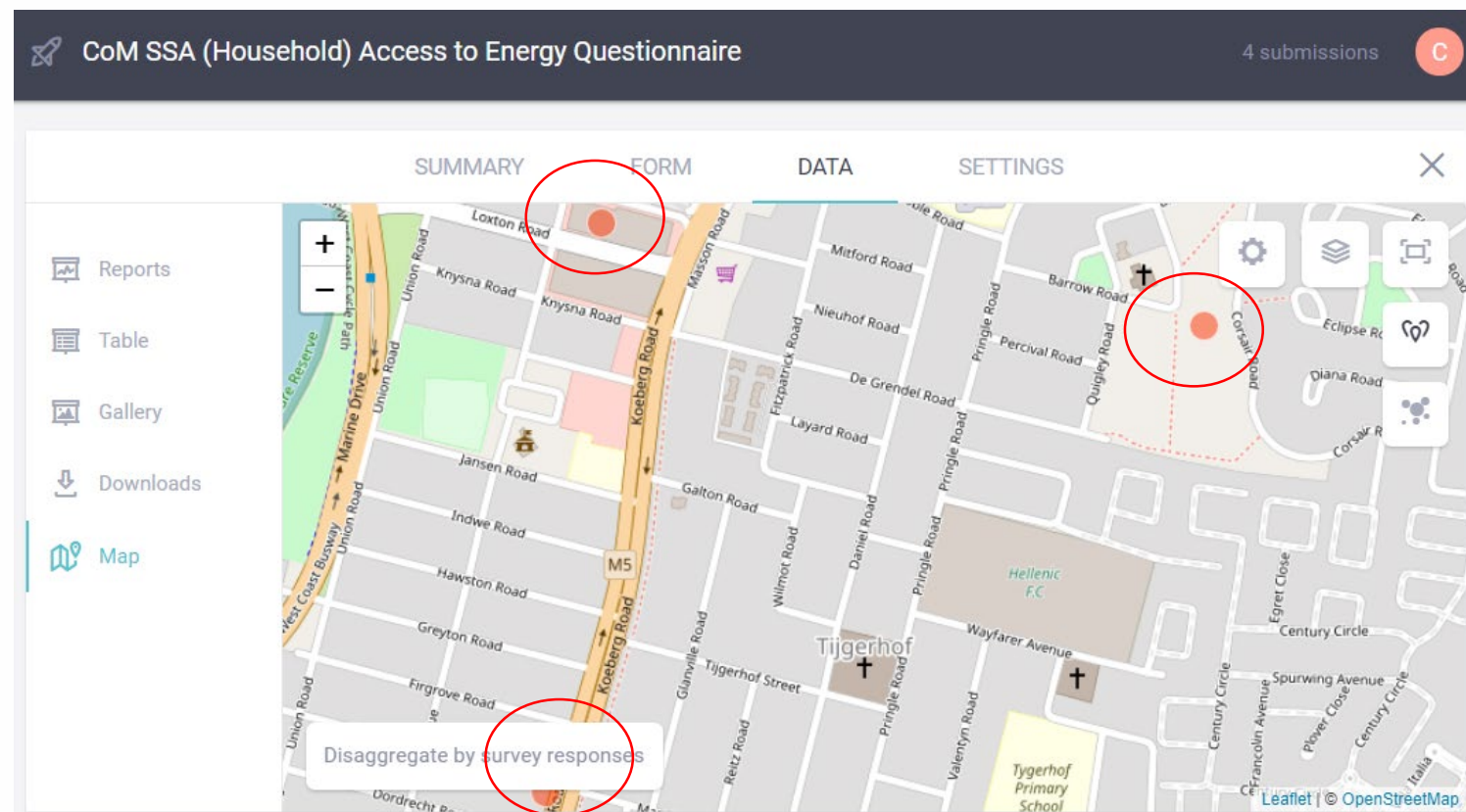
***What is the main fuel used for lighting in your household?**

- ☐ Electricity
- ☐ solar energy
- ☐ LPG
- ☐ Charcoal
- ☐ firewood

KOBO TOOLBOX:

Data collection results

- Results can be viewed as:
 - Reports
 - Tables
 - Gallery
 - Downloads
 - Maps



After data collection...

DATA



SORTED



ARRANGED



PRESENTED
VISUALLY



PHOTOGRAPHY BY BRANDON ROSSEN PHOTOGRAPHY WWW.BRANDONROSSEN.COM @BRANDONROSSEN



1. Data cleaning and analysis

- Data cleaning is a vital step, and various tools can be used:
 - Stata
 - Python
 - Excel

2. Back-checking with respondents

- Go back to the field if necessary

3. Data analysis



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BEST PRACTICES FOR DATA COLLECTION:



- Ethical clearance should be obtained prior to data collection
- Clarify data collection goals
- Develop guidelines for how data should be collected
- Develop data collection work plan
- Validate data collection method before starting data collection
- Continue improving data collection method and ensure compliance to guidelines



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BEST PRACTICES FOR DATA COLLECTION:



- Importance to check data as it is coming in (get data in real time)
- Decide who will be responsible for data cleaning .
- Request back-check permission at the end of an interview` (get phone numbers)
- Develop questions for result (quality) checks



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OTHER DATA SOURCES

Other sources for Data collection for
the access to energy pillar of the
SEACAP:

1. Local data ideal
2. National data in absence of local data (from public institutions)
3. International organisations like the FAO, IEA, IRENA,
4. Online platforms like the climate information platform of CSAG
5. Collaboration with universities
6. Data scaling: by comparing population or number of petrol stations



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OTHER TOOLS:

Data Collection Guide

CoM SSA Household questionnaire

Household Data Collection Guide

1. Data collection process

This document provides an overview of the data collection process in the field. It covers supervision of data collection and provides step-by-step instructions regarding the sequence of interviewers' tasks during the field work before an interview with a participant starts.

1.1. Intended audience:

This data collection guide is designed for use by those fulfilling the following roles:

- Field team supervisors
- Data collection staff
- Survey Coordinator.

1.2. Timeframes:

Data collection takes approximately 10-12 weeks. This depends, however, on the number of staff available as well as on the logistics in a country. This is also dependent on the sample size. The actual timeframe can be confirmed during the pilot phase of the data collection work, which should be done under the same conditions as the planned work on data collection.

2. SUPERVISING DATA COLLECTION

Members of the data collection team may have different levels of skills, experience and varying strengths and abilities. To ensure high standards of data collection, appointing field team supervisors to lead and supervise the data collection teams is necessary. This section outlines the roles of field supervisors during the data collection process. The core tasks of a **field team supervisor** are outlined below:

1. Obtaining and preparing household lists and maps for each area as well as other forms to be used during data collection.

These may include obtaining and preparing lists of households and maps for each area lists to be used as the sampling frame, data collection forms, devices for data collection, supplies and equipment. It also entails distributing these materials to data collectors. The field team supervisors will need to obtain household lists and maps of the selected clusters from the Survey Coordinator, manage them, and provide them to the data collectors during the field work.

Contents:

- Data collection process overview
- Role of different actors before, during and after data collection
- Data collection requirements
- How to react to different scenarios during data collection
- Explanatory notes to use during data collections
- Reference to other useful tools in the SEACAP toolbox



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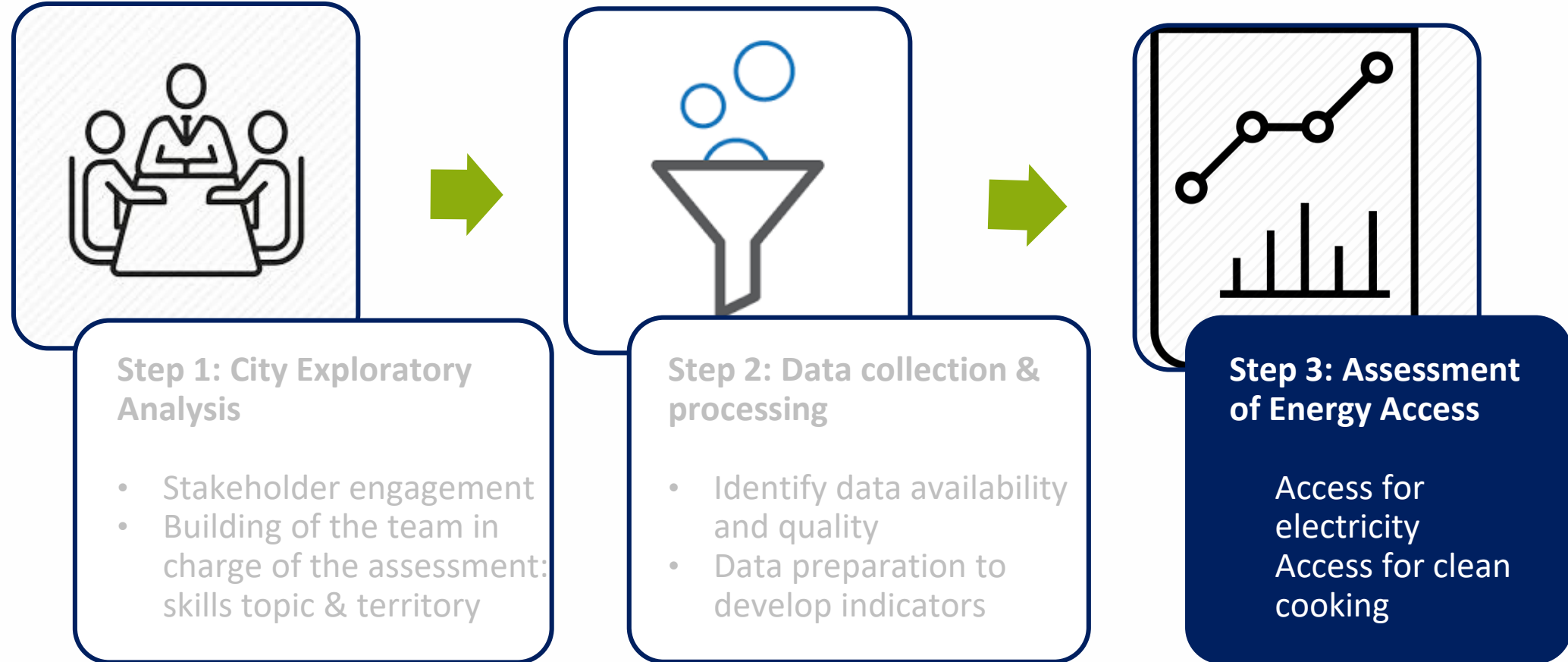
OTHER TOOLS IN THE TOOLBOX FOR DATA COLLECTION:

- Link to the digital energy access kobo questionnaire
- Excel (xls) version of the questionnaire to upload and customise
- Guide and tips on how to build and customise the kobo questionnaire, including lessons learnt
- Interview consent form & Interview tracking form



STEP 3 OF ACCESS TO ENERGY ASSESSMENT:

ASSESSMENT OF ENERGY ACCESS



ASSESSMENT OF ENERGY ACCESS

What should be included in the energy assessment report?

- Summary of city overview, including demography, economy, political structure, land area, climate change and environmental challenges
- An overview of actors and policies in the city's energy sector
- Data collection methodology, stakeholders, tools, survey, etc.
- Access to electricity and access to clean cooking data and interpretation for households and institutions, taking into account urban and rural divide
- Key recommendations



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CoM SSA SEACAP Toolbox

3.2 SEACAP Planning:

Phase 2.1: Energy Access Data Collection

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What you learnt in this chapter:

- The 3 steps of how to conduct an Access to Energy Assessment
- Data collection methods and sampling techniques
- Data collection tools in the toolbox
- Inclusions for Energy Access Assessment Report

The next chapter is: 3.3: Target setting and action planning of the Access to energy pillar of the SEACAP



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