# Uganda 2016/17 poverty mapping
## - Dissemination of results

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# **Outline**

1.  Objective of the Presentation
2.  Methodology
3.  Poverty Maps
4.  Next Steps  and Way Forward

# Objective of this presentation

- The objective of this presentation is
  - to present results from the 2016/17 poverty mapping exercise,
  - And to discuss the distribution of poverty
  - And receive feedback from Stakeholders
- All numbers in the 2016/17 poverty maps were produced by UBOS in collaboration with UNICEF and World Bank
  - The role of the World Bank changed from a co-producer to an advisor with the production of poverty maps for the 2012/13 and continued when producing 2016/17 poverty maps

# Methodology (1)

Surveys:

- Provide comprehensive information on living standards including income and/or consumption
- Information on poverty
- Cover only a relatively small subset of households

*But have:*

- Limited disaggregation
- Limited links to other datasets

# Methodology (2)

Censuses:

- Complete coverage for all individuals and households in a country
- Data can be compiled for small administrative areas
- Information on welfare correlates
- Not very frequent (typically once a decade)
- Have a limited number of indicators

*But have:*

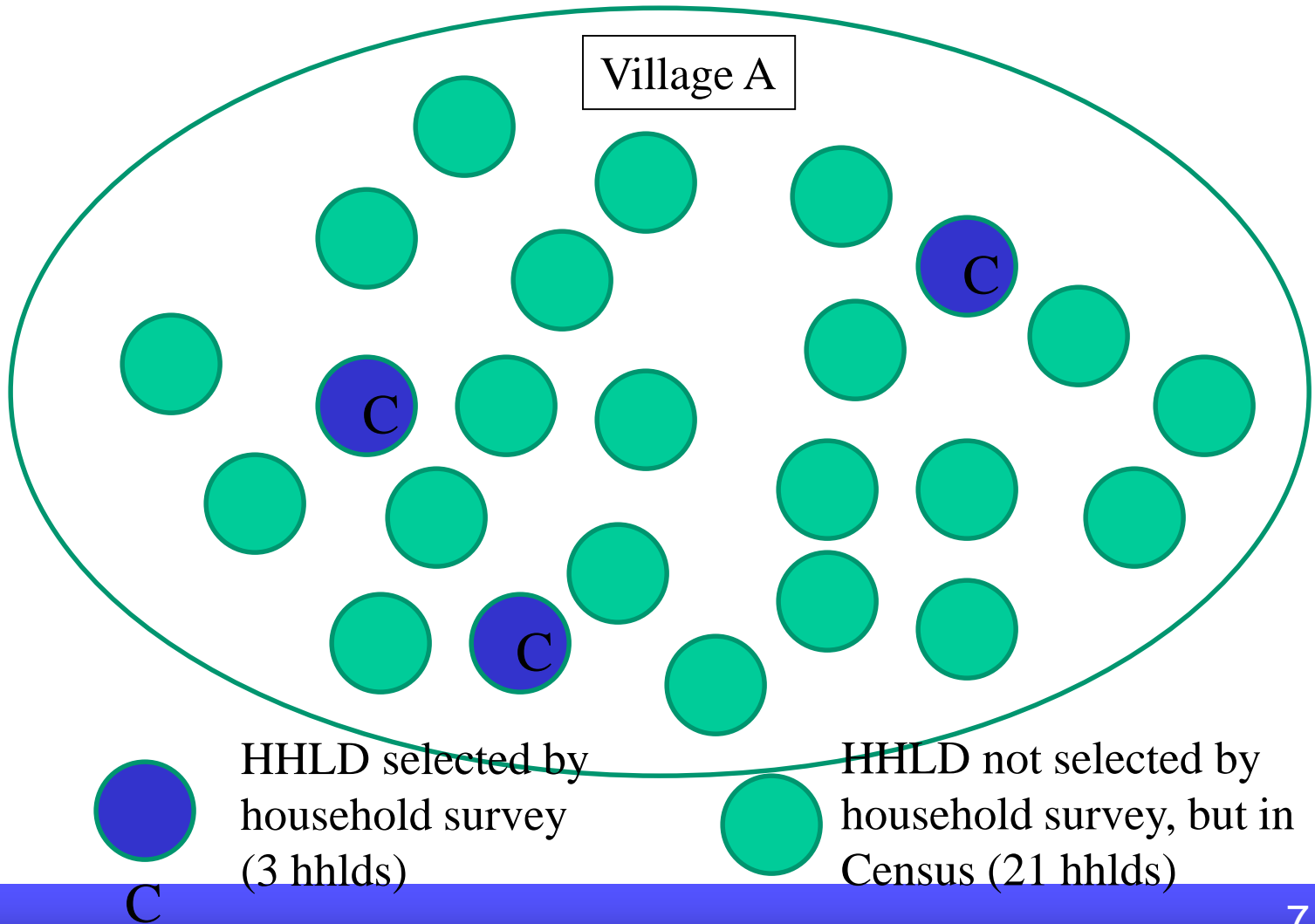- No information on poverty

# Methodology (3)

Small Area Estimation (SAE):

- A statistical inference technique that allows estimation for very small areas by combining information from censuses and household surveys

*SAE maps:*

- Combine the depth of information in a survey (e.g. household expenditure) with the complete spatial coverage available in a census (without detailed information on welfare)
- Have some degree of uncertainty (standard errors)
- Methodology developed by researchers at the World Bank (details in Elbers, Lanjouw and Lanjow – Econometrica, 2003)

# Illustration (I): How does ELL work?



Village A

HHLD selected by household survey (3 hhlds)

HHLD not selected by household survey, but in Census (21 hhlds)

C

# Methodology (4)

Sources of Data:

- Population and Housing Census 2014
  - ✓ *Population module*
  - ✓ *Housing module*
  - ✓ *Agriculture module*
  - ✓ *Community module*
- UNHS VI (2016/17)
  Socioeconomic module (Over 15,000 households)

- Administrative data (Geography file)

# Methodology (5)

Selection of Variables

- *Obtain census and survey data*
- Check definitions of variables
- Select variables that pass the means test (95% CL)
- Match EAs surveyed to those in the census and compute indicators
- Plot and check distributions of continuous variable

# Methodology (6)

Stage One:

- Estimate model of consumption in the household survey based on common variables.

*Stage Two:*

- Use coefficients from survey regression and indicators from census to predict expenditures for each census household.

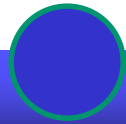- Estimate poverty and inequality for small areas using the predicted expenditures

# Illustration (II): How does ELL work?

$\hat{C}=F(X)$    X
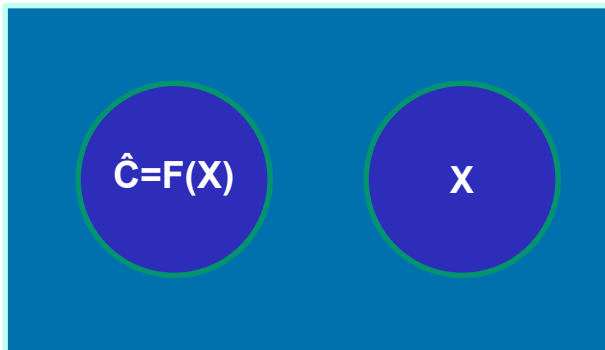
- Using the formula, project household expenditures from 10 – 15 simple questions (X) in Population Census

- Projection formula (F(X)) is estimated in UNHS

- Reliability of F(X) is critical for poverty mapping

# Illustration (III): How does ELL work?
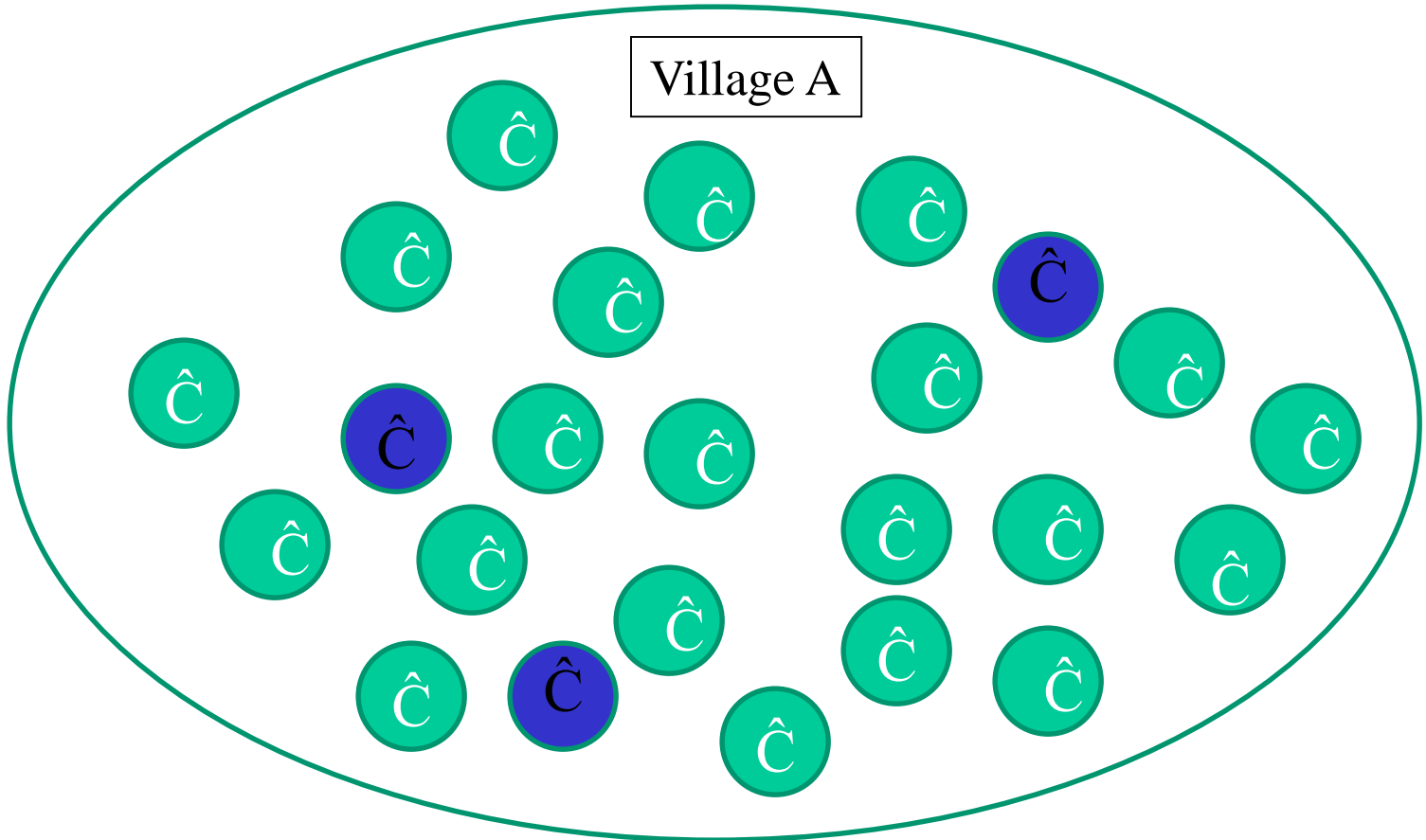
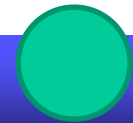

Village A

Legend:
- HHLD selected by household survey (3 hhlds)
- HHLD not selected by household survey, but in Census (21 hhlds)

# Illustration (IV): Estimating poverty rates

| HHNO of District A | Simulated values (rounds) | | | | | |
|---|---|---|---|---|---|---|
| | 1 rd | 2 rd | 3 rd | 4 rd | ... | 100 rd |
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |
| ... | | | | | | |

Poverty rate

Poverty line

Poverty rate of Village A = Average Poverty rate =

# Implementation of poverty mapping using ELL method

- The World Bank developed software for poverty mapping – PovMap2

  - PovMap2 is easy to implement and produces all key statistics to evaluate the reliability of poverty maps and was used for the 2012/13 maps

- UBOS team produced all poverty and inequality numbers using new STATA programs/models with detailed programming but with the ELL methodology behind the programs for the 2016/17 poverty maps

# Key examinations for good poverty mapping

- We examined whether formulas (F(X)) are estimated well

- We then evaluate the accuracy of poverty estimates

# Check list for evaluating formulas (F(X))

- R2; Adjusted R2
  - Measuring how much the predicted expenditure can explain the true level; Usually around 30% to 60%

- T-value for each coefficients
  - Check whether each coefficient is statistically different from 0; good if t-value is more than 2

- Ratio of variance of cluster level error to that of total error

$$\frac{\sigma_\eta}{\sigma_\eta + \sigma_\varepsilon}$$

  - The larger this ratio, the less reliable the poverty estimate.
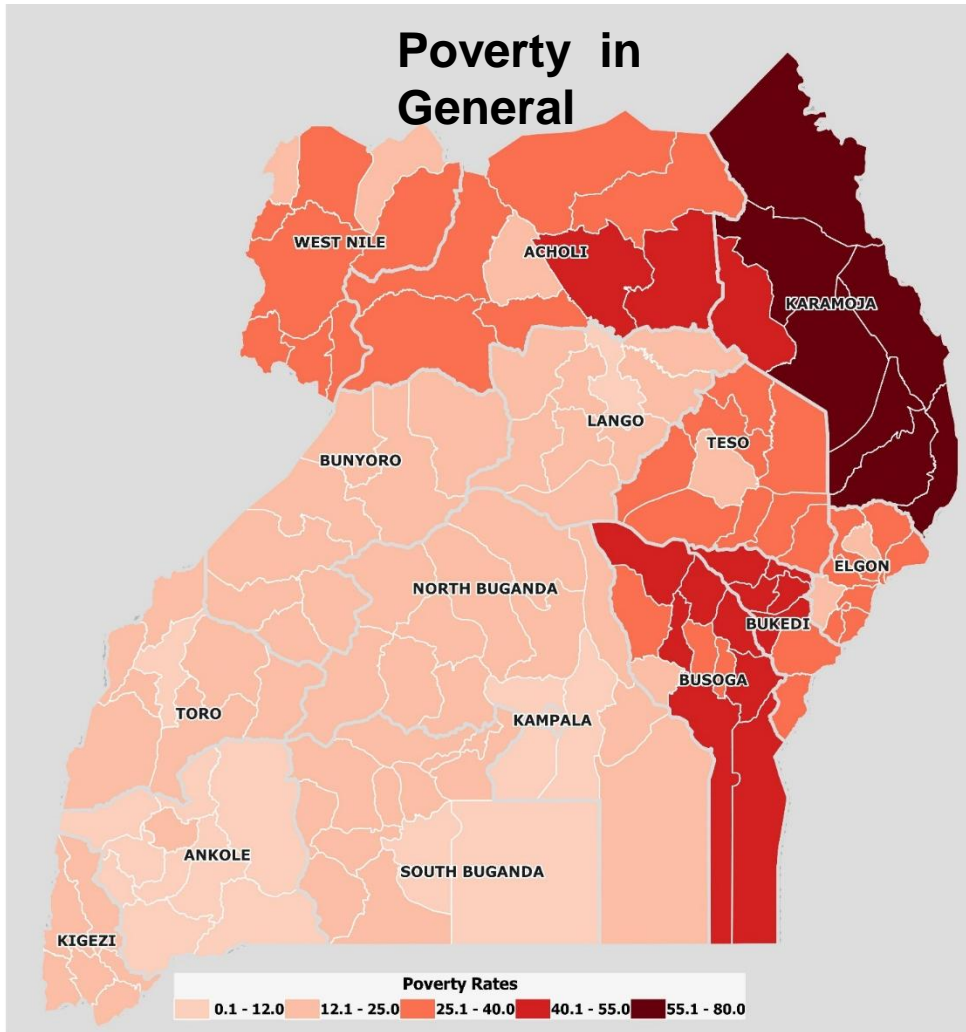  - Preferably less than 5 percent

# Another test for evaluating formulas – frequency of trimming

▶ Poverty and inequality statistics from the poverty mapping is very vulnerable to outliers during simulations

  ▶ Trimming – Dropping outliers – is necessary

▶ However, we do not want to use a model that produces many outliers

▶ Examine the frequency of trimming

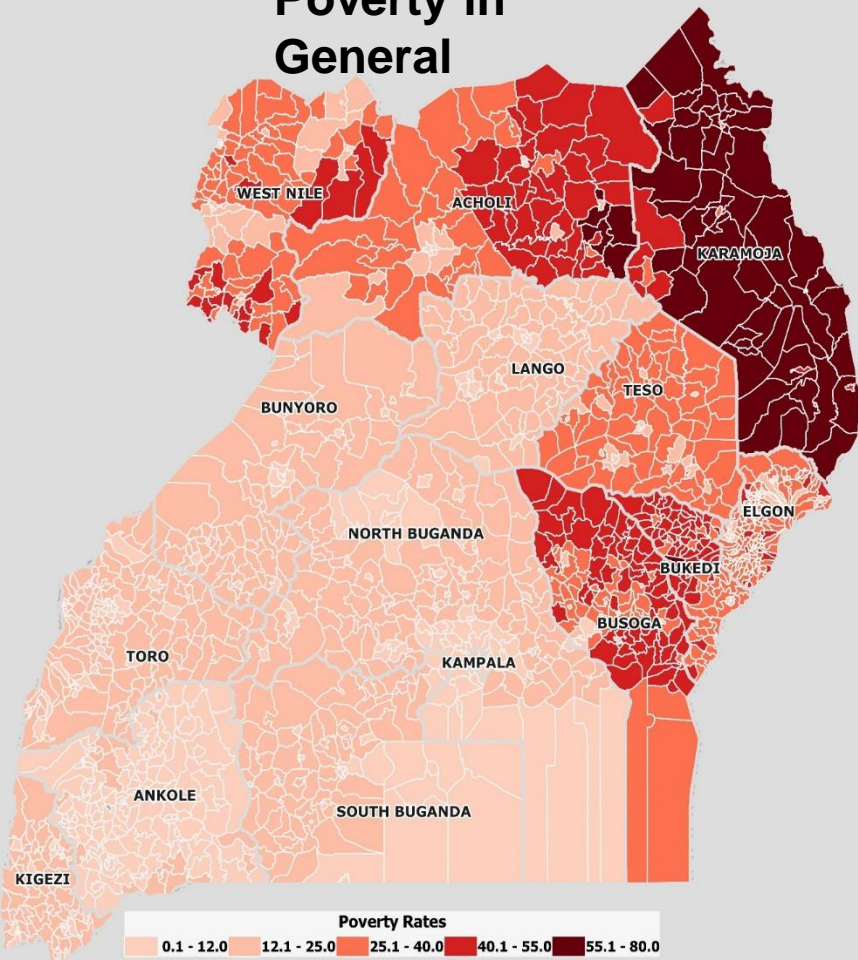# Poverty Maps

# The 2016/17 poverty maps at the District level



## Poverty in General

Poverty Rates

| 0.1 - 12.0 | 12.1 - 25.0 | 25.1 - 40.0 | 40.1 - 55.0 | 55.1 - 80.0 |

## Child Poverty

Child Poverty Rates

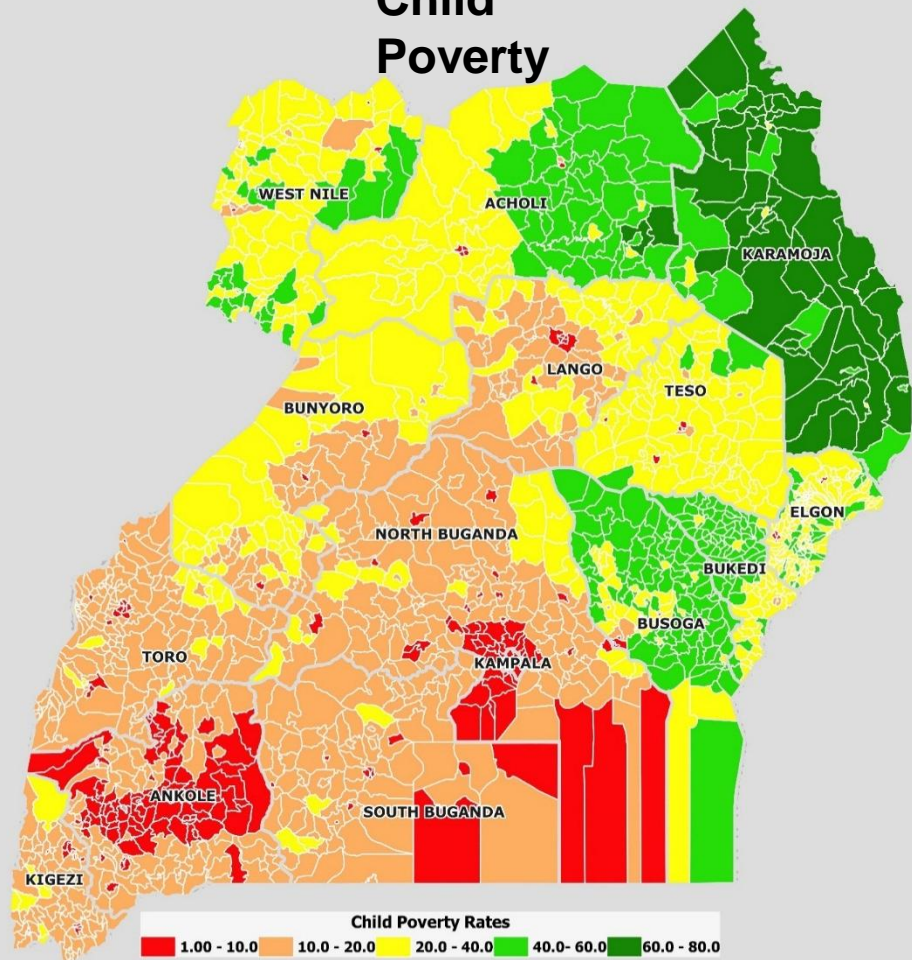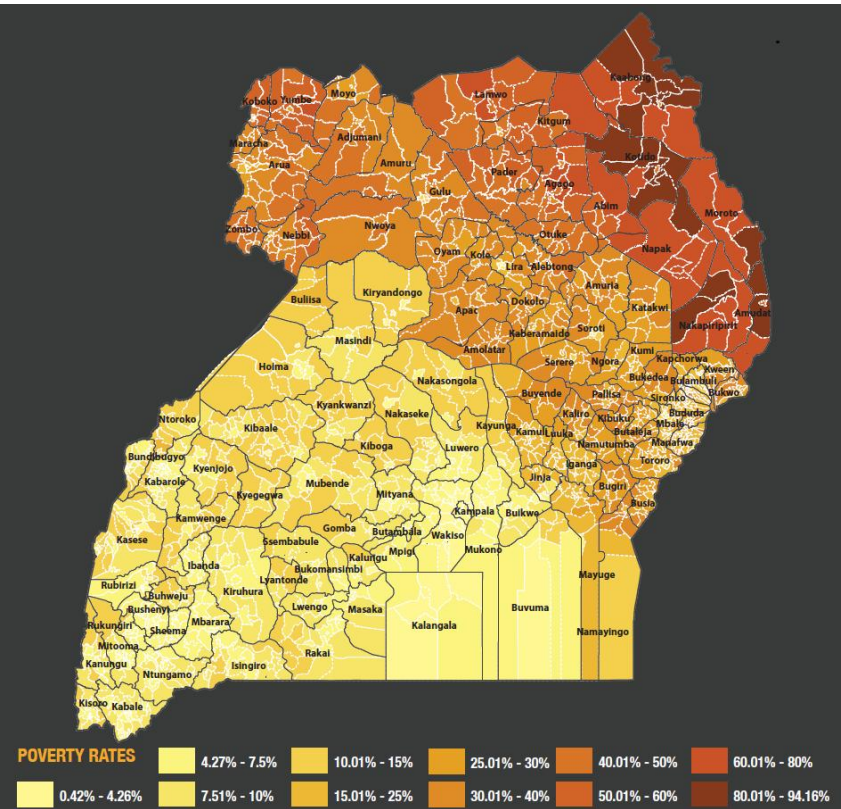| 1.0 - 10.0 | 10.1 - 20.0 | 21.1 - 40.0 | 40.1 - 60.0 | 60.1 - 80.0 |
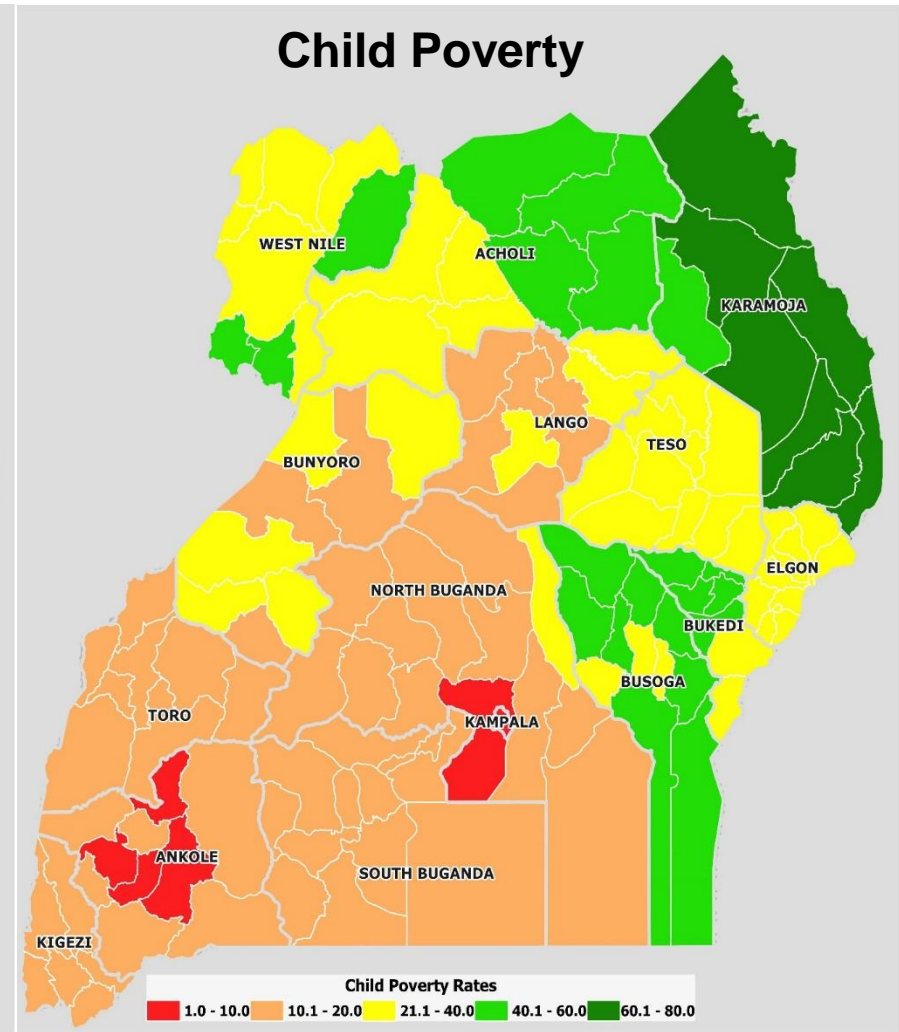
# The 2016/17 poverty maps at the sub-county level



Poverty in General

Child Poverty

**Poverty Rates**
0.1 - 12.0 | 12.1 - 25.0 | 25.1 - 40.0 | 40.1 - 55.0 | 55.1 - 80.0

**Child Poverty Rates**
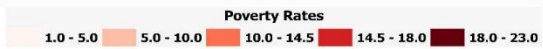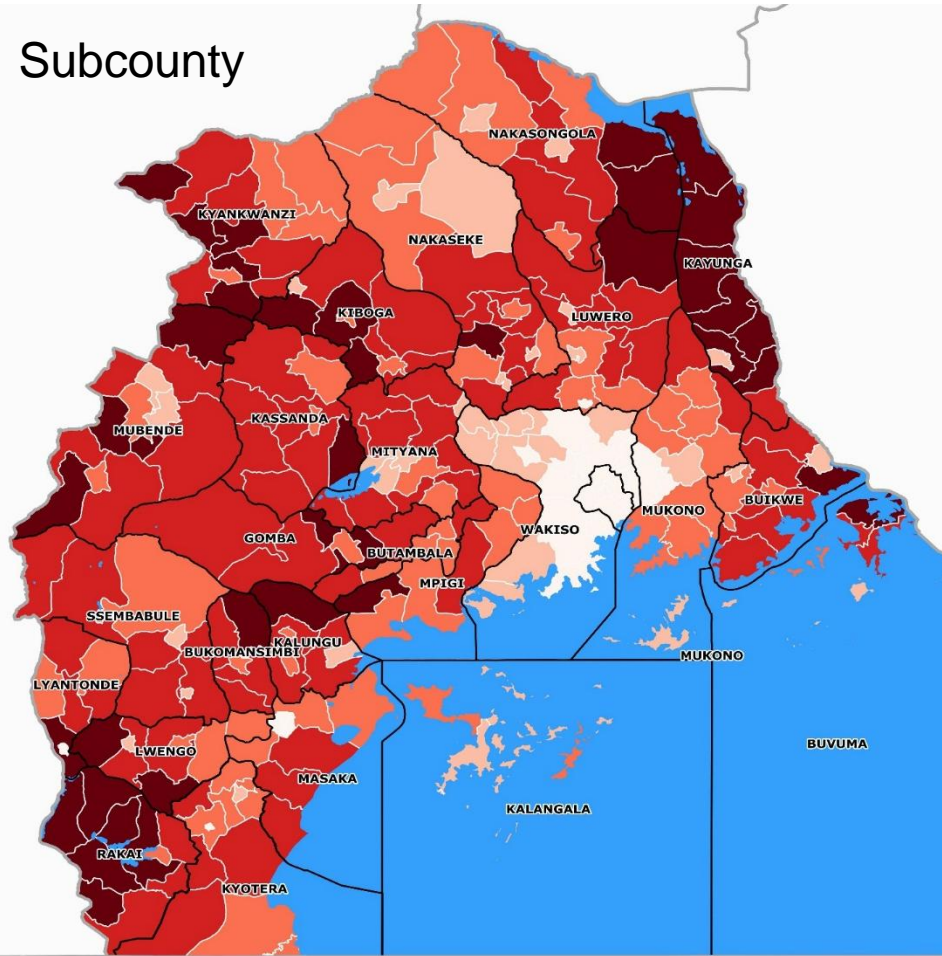1.00 - 10.0 | 10.0 - 20.0 | 20.0 - 40.0 | 40.0- 60.0 | 60.0 - 80.0

# The 2012/13 poverty maps at the sub-county level
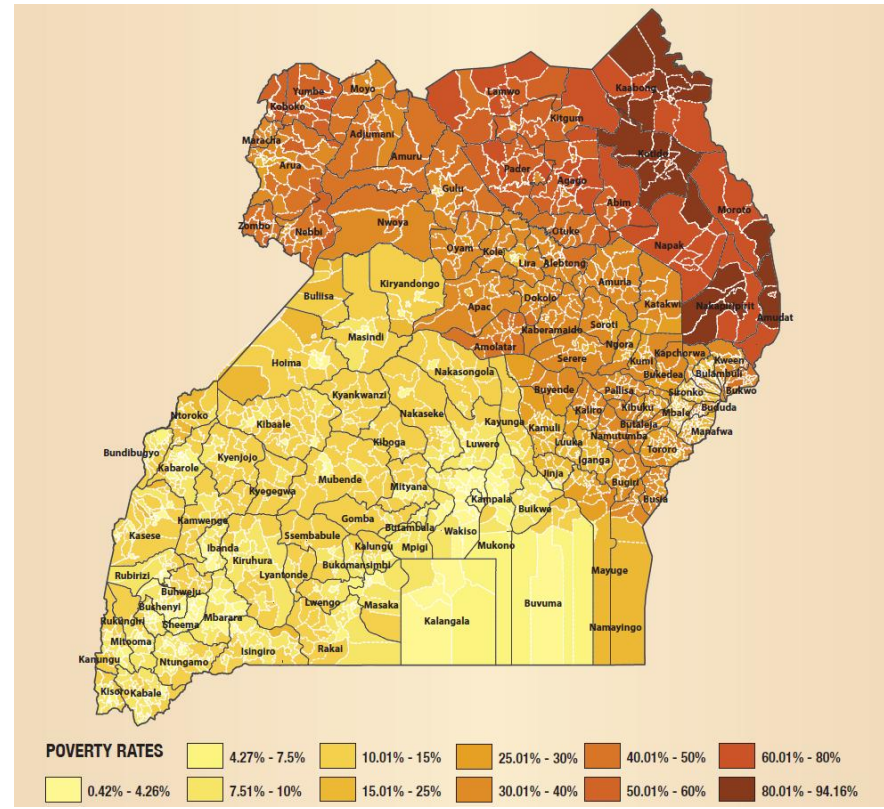


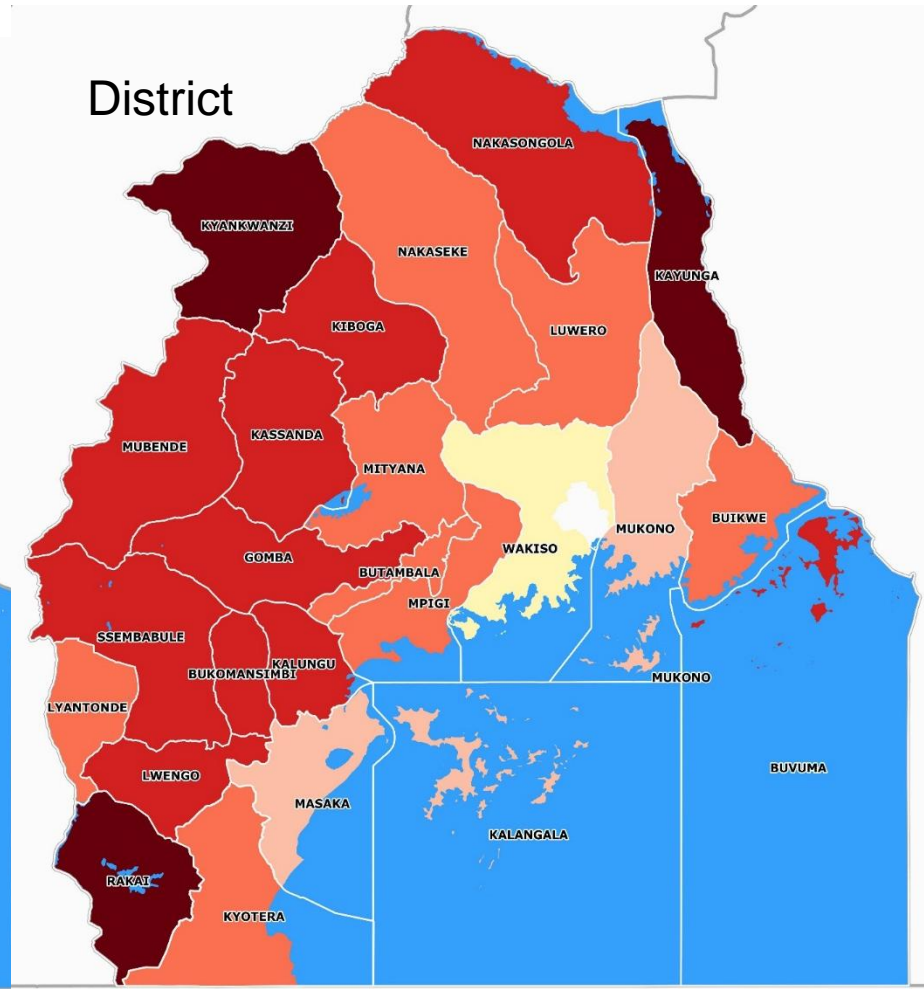population below the poverty line        below the poverty line

# Central Region - Poverty



Subcounty

District

Poverty Rates: 1.0 - 5.0 | 5.0 - 10.0 | 10.0 - 14.5 | 14.5 - 18.0 | 18.0 - 23.0
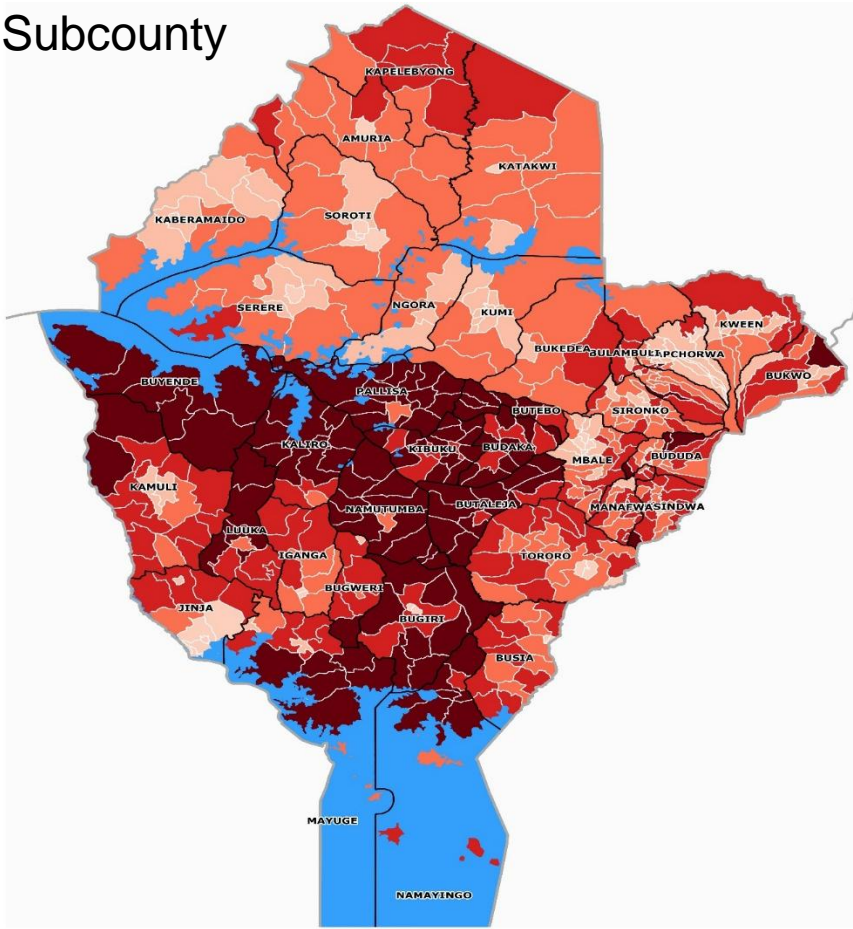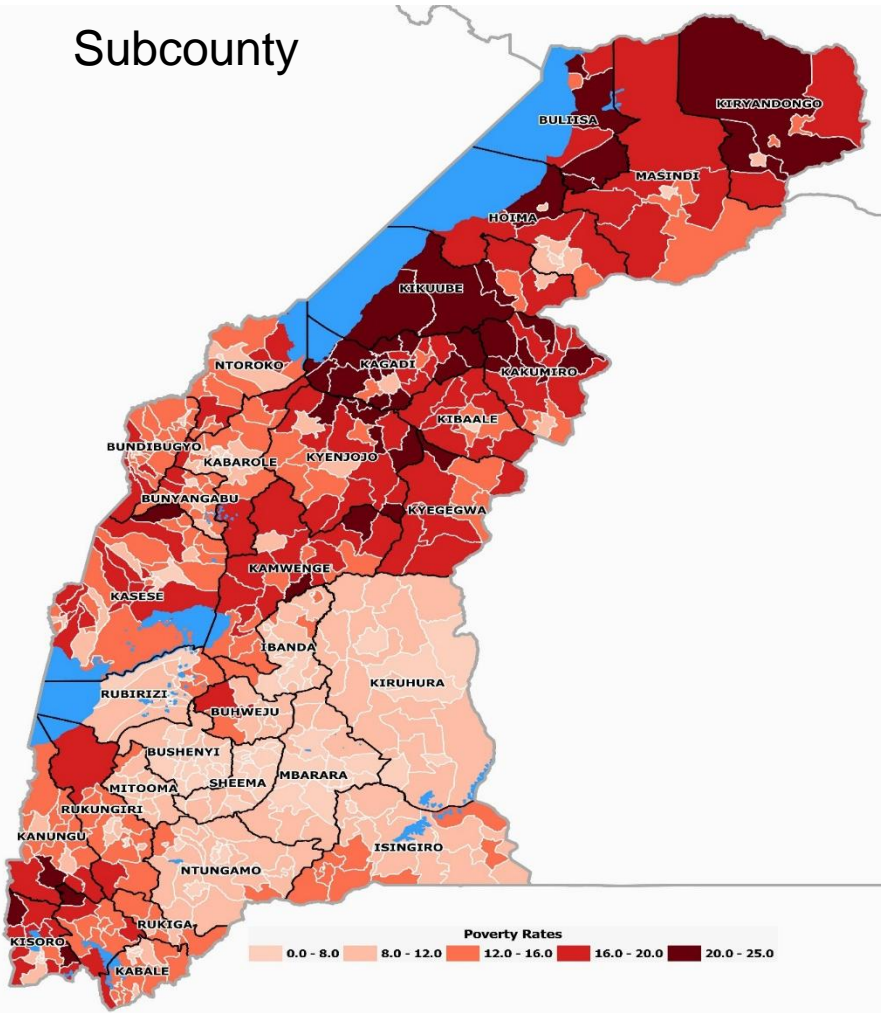
Poverty Rates: 2.6 - 2.6 | 2.6 - 10.6 | 10.6 - 14.5 | 14.5 - 17.0 | 17.0 - 19.3

# Eastern Region - Poverty



Subcounty

District

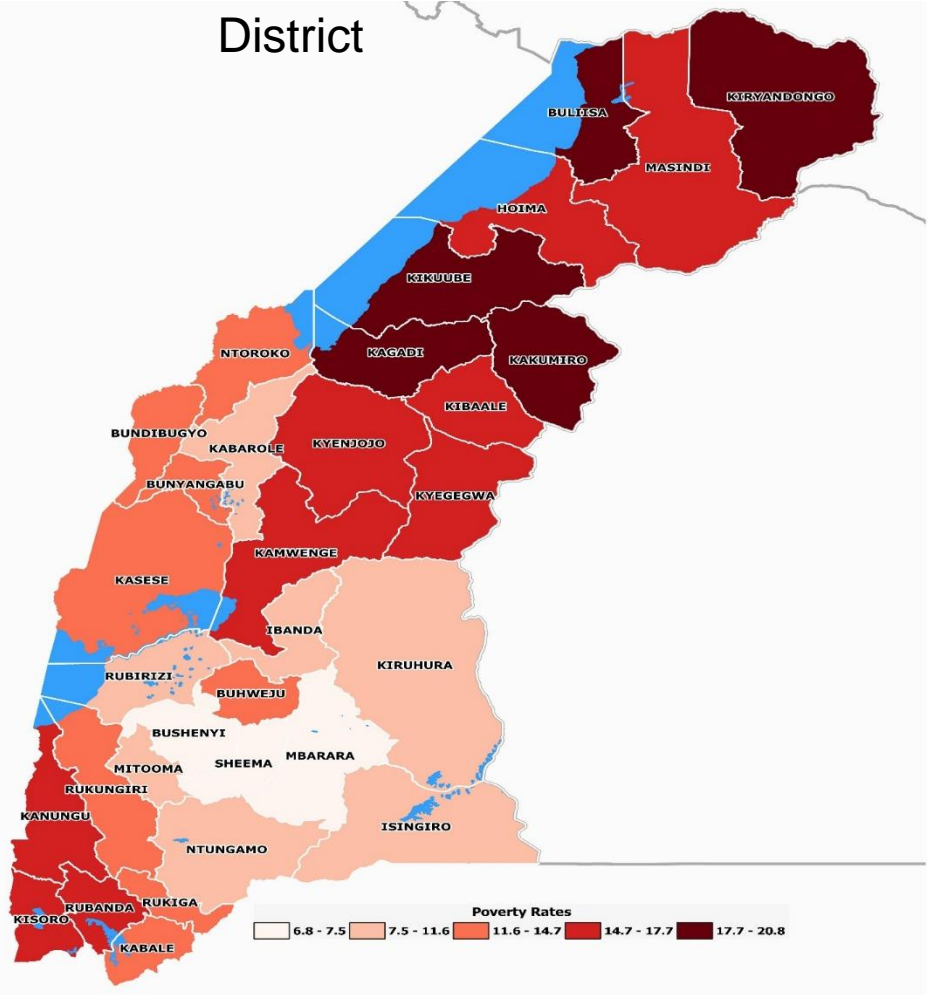Poverty Rates (Subcounty): 2.0 - 15.2 | 15.0 - 27.0 | 27.0 - 35.0 | 35.0 - 42.0 | 42.0 - 56.0

Poverty Rates (District): 22.6 - 27.1 | 27.1 - 32.5 | 32.5 - 37.1 | 37.1 - 44.3 | 44.3 - 47.8

# Western Region - Poverty



Subcounty

Poverty Rates
- 0.0 - 8.0
- 8.0 - 12.0
- 12.0 - 16.0
- 16.0 - 20.0
- 20.0 - 25.0

District

Poverty Rates
- 6.8 - 7.5
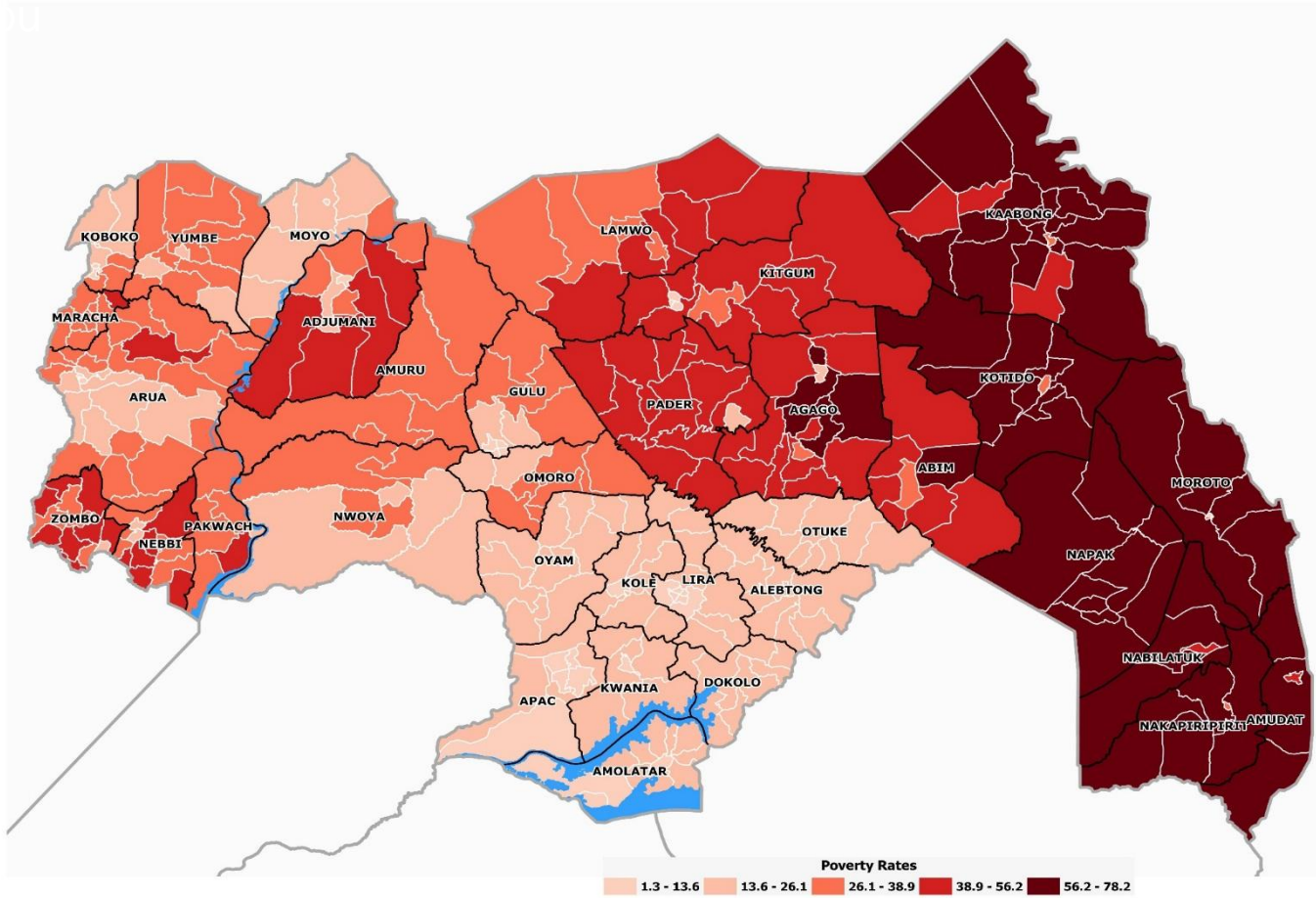- 7.5 - 11.6
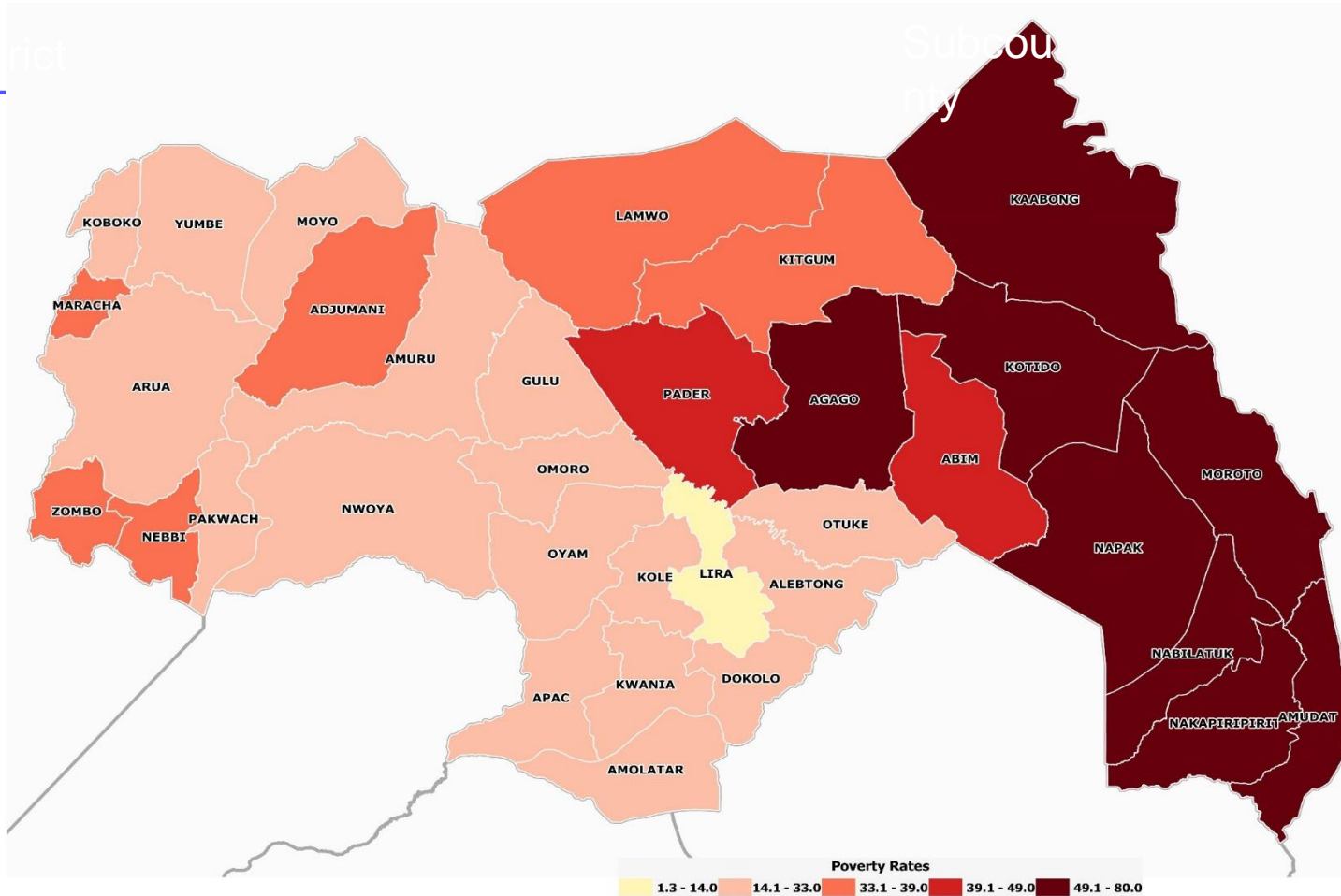- 11.6 - 14.7
- 14.7 - 17.7
- 17.7 - 20.8
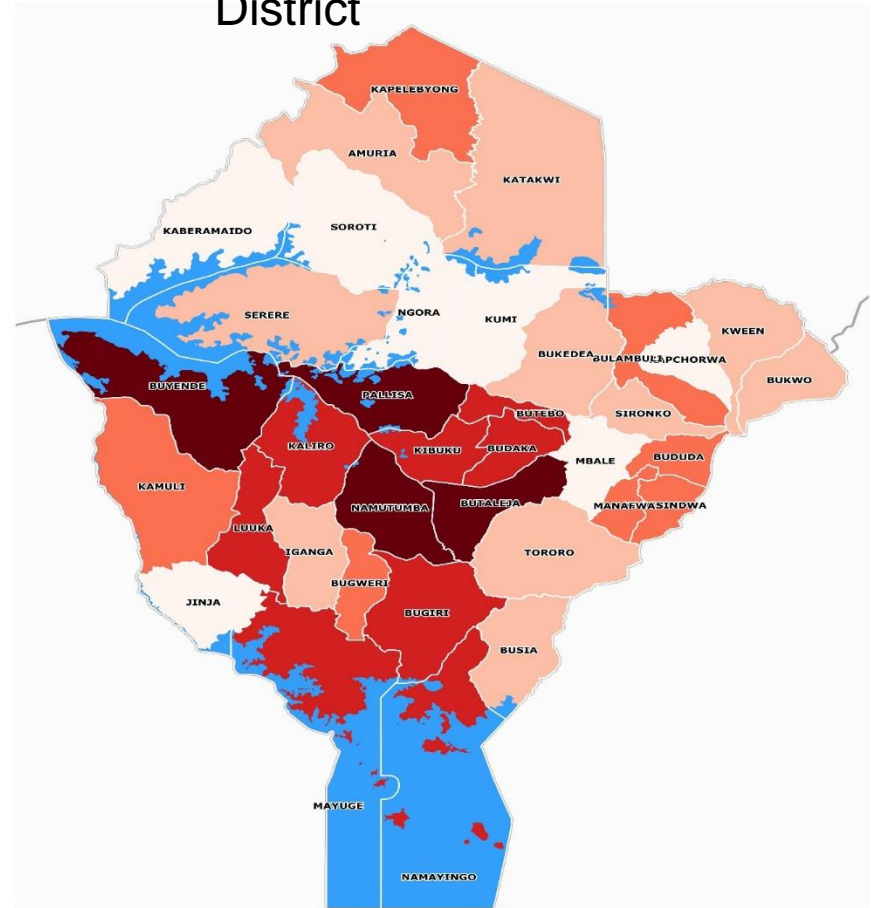
# Northern- Sub-County Poverty

# Northern Region - District Level

# Challenge

**Continuous creation of Administrative units becomes the biggest challenge as the Geography file has to be updated every time when this is done and it can be time consuming**

# Next Steps

1. Finalize the Technical Report and have it launched

2. Print all the maps and share with the stakeholders

# **Acknowledgement**

- We thank the World Bank for providing the Technical Assistance for this work and UNICEF for both Technical and Financial Assistance

- THANK YOU FOR LISTENING