Closing data gaps and promoting evidence-informed decision-making for food security
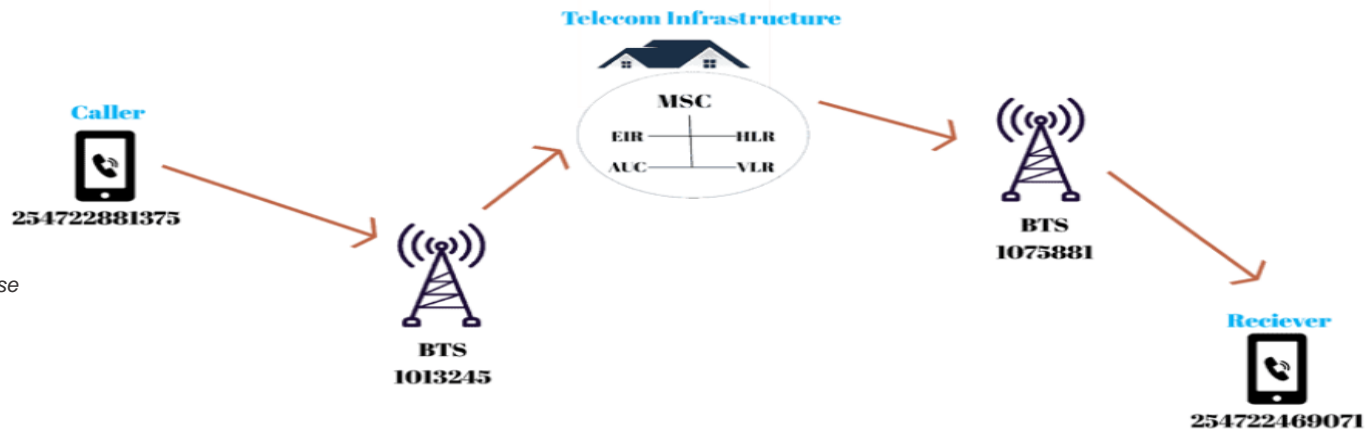
Brian King, Coordinator Platform for Big Data in Agriculture
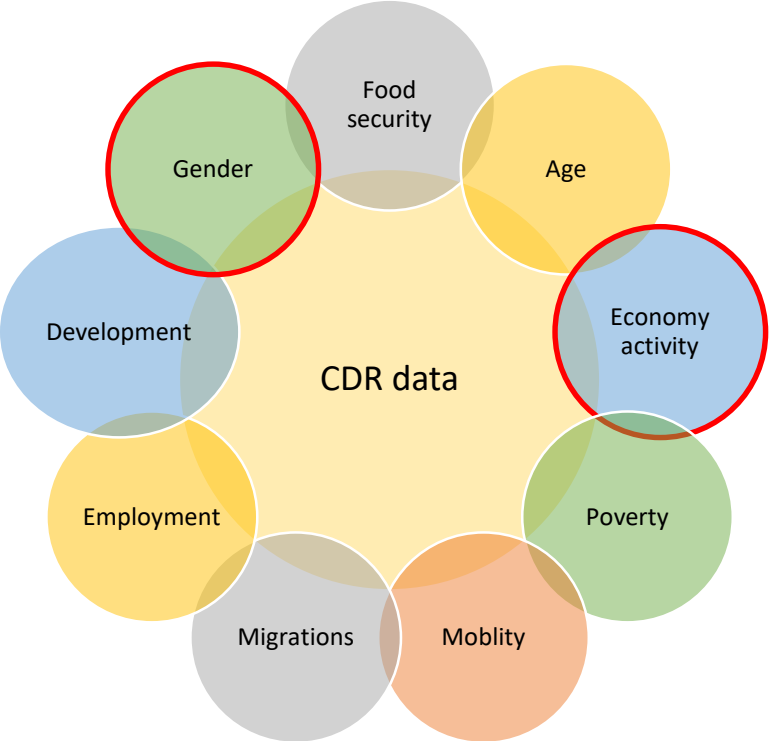April 21, 2021

Call Detail Records Data
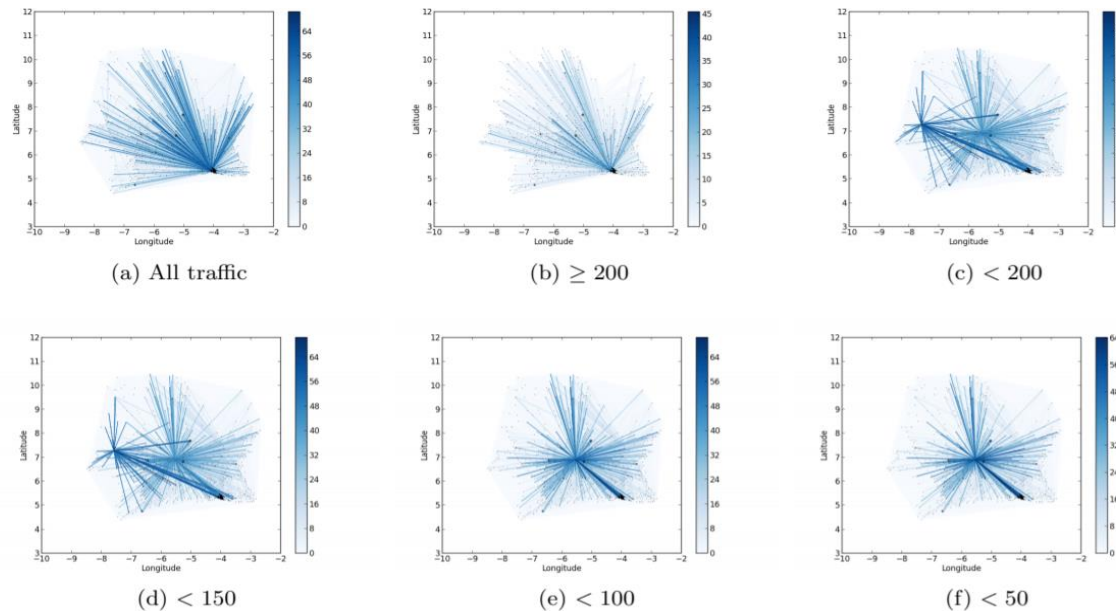
(a) All traffic

(b) ≥ 200

(c) < 200

(d) < 150

(e) < 100

(f) < 50

Figure 3: Inter-antennae communication distribution. Figure 3a plots that distribution of outgoing calls during the period (150 days). Figures 3c-3f give percentage of the inter-antennae communication for regions with N inhabitants.

Objective

Figure 1. Socioeconomic Indicators upon CDR data. - Source:.Vanya Slavchevska ; Dharani Burra International Center for Tropical Agriculture (CIAT) – Regional Office for Asia
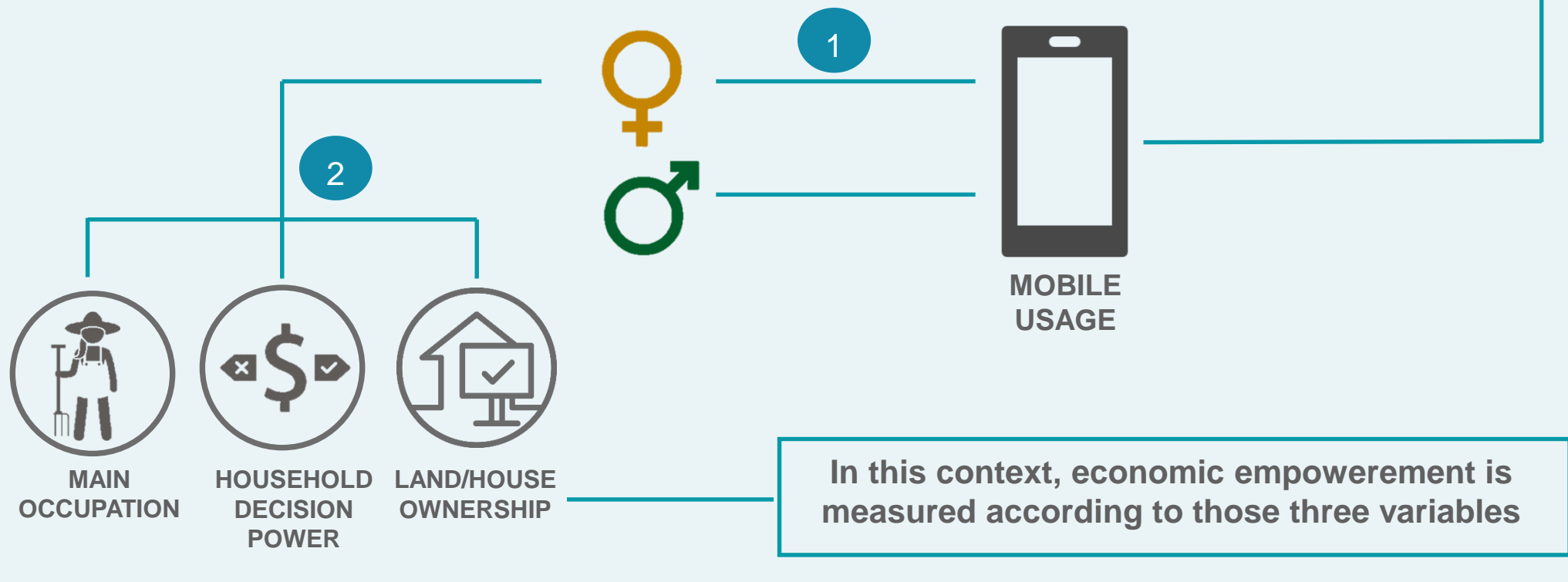
To assess the potential of using Call Detail Records (CDRs) to predict mobile phone users' sex and economic empowerment, both separately and jointly

We developed a model that can predict (i) sex and (ii) women economic empowerment by leveraging telecom data and machine learning

1

2

MOBILE USAGE

MAIN OCCUPATION

HOUSEHOLD DECISION POWER

LAND/HOUSE OWNERSHIP

In this context, economic empowerement is measured according to those three variables

The model aims to generate data on women 's empowerment and fill the gender data gap

The model has been developed in Uganda. The project methodology contains 3 phases

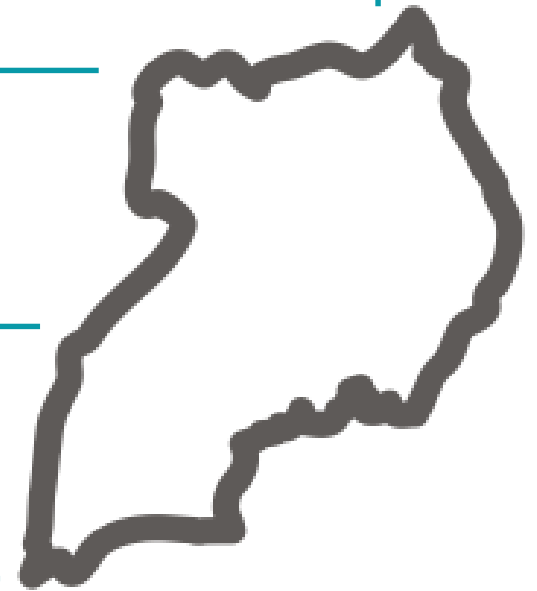**1** Ground-truth sex and economic empowerement data collected through phone survey

2 Machine learning model to predict **sex and women economic empowerement** indicators based on mobile usage

3 Model evaluation and interpretation of the results

Data-driven archetypes/profiles to begin to address the gender data gap

Abbo [1]

- 26 years old, Elgon region
- Married
- 3 children
- Subsitence Farmer
- Owns a house with her husband and would like to invest in a plot for agriculture

1. Illustrative Example

Literature review

- CDR have been used to predict several variables relevant to food security, for example:

Access
– poverty (Blumenstock et al. 2015);
– human migration/movement (Lu et al. 2016);
– population estimates (Deville et al. 2014);

Use/Utilization
– literacy (Montjoye et al. 2013)
– personality (Montjoye et al. 2013), etc.
– Sex of mobile phone users (Dalberg 2019; Jahani et al. 2017, etc).
– Socio-economic status (Gutierrez et al. 2013; Pål Sundsøy et al. 2016)
– Food consumption and poverty (Decuyper et al. 2014)

Stability (Shocks)
– the spread of epidemics (Wesolowski et al. 2015);
– disaster responses (Bengtsson, et al. 2011);

THANK YOU

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