Measuring Urban Food Security in Kampala
Implications for program targeting, monitoring, and evaluation of development assistance in cities

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Overview

• Conceptual considerations
• Research focus
• Food Insecurity Landscape in Kampala
• Structure of common indices
• Comparison of measures
  • Universal (FIES) v. context-specific (CSI)
  • Diet diversity indicators
  • Spectrum: conceptual, severity
  • Social acceptability dimension
• Methodological considerations
Two Paradigms for Food Security Measurement

**Objective**
- Dietary intake
- Expenditure
- Anthropometric
- Morbidity/mortality
- Coping behaviors/practices

**Subjective**
- Perceptions of inadequacy
- Worry
- Exposure to risk
- Cultural acceptability
Analytic Needs for Food Security Measurement

Comparative
Estimated Peak Size of the Population in Need of Emergency Food Assistance in 2017

In-Depth
Informal Settlements in Kampala, Uganda, 2011

The Nature & Measurement of Urban Food Insecurity

How do the urban poor experience hunger?

How well do commonly used indicators reflect urban food insecurity?

How can we improve data quality, interpretation, and analysis to inform design, targeting, evaluation, and monitoring of food security interventions?
Research Questions & Data Sources

- How do people in Kampala slums cope with food insecurity?
- Is a local coping strategy index still valid if I have ‘messy’ focus group findings (that do not ‘fit’ the parameters of the technical guidance)?
- Does the Food Insecurity Experience Scale survive translation?
- How do 10 different measures of food security portray the food security situation of the same population?

- 100+ informal interviews
- 18 focus groups
- 500 surveys (representative PPS sample)
- 20 in-depth cognitive interviews
Food Security Indicators

Household Food Insecurity Access Scale (HFIAS)
Household Hunger Scale (HHS)
Food Insecurity Experience Scale (FIES)
Coping Strategies Index (CSI)
Reduced Coping Strategies Index (rCSI)
Self-assessed measure(s) of food security (SAFS)
Months of Inadequate Food Access (MIFA)
Household Dietary Diversity Scale (HDDS)
Food Consumption Score (FCS)
Anthropometric Scores (e.g. stunting)*
Urban Vulnerability & Resiliency

- Housing: density, safety (flooding), security (shacks), cost
- Livelihood insecurity, un/under-employment
- Land access: limited opportunities for horticulture/agriculture
- Social norms & stigmatizing coping/adaptation strategies
- Toxic & municipal waste exposure
- Food & water safety*
- Latrine & hand-washing access*
- Reliance on purchased food + price variability + diversity in market *
- Dynamic food preferences (e.g. regional, rural-to-urban)*
- Social networks & safety nets*
- Corruption, political economy, public service delivery, infrastructure*
Units of Analysis: FAO’s Food Insecurity and Vulnerability Information and Mapping System (FIVIMS) Framework

**National, Subnational, Community**

- **Vulnerability Context**
  - Education
  - Trade policy
  - Laws & rules
  - Natural resources
  - Services
  - Market conditions
  - Technology
  - Climate
  - Civil strife & conflict
  - Social institutions
  - Cultural norms
  - Care practices
  - Sanitation practices
  - Sanitation facilities
  - Waste management
  - Disease exposure

- **Food Economy**
  - Food Availability
    - Production
    - Trade
    - Food aid
  - Stability
    - Price variability
    - Livelihoods
    - Political factors
    - Natural disasters
    - Conflict
  - Food Access
    - Physical access
    - Purchasing power
    - Entitlements

**Household**

- Household Livelihood Strategies, Assets, & Activities
- Household Food Access
- Care Practices
  - Child care
  - Feeding practices
  - Nutrition knowledge
  - Food preparation
  - Eating preferences & habits
  - Intra-household food allocation
- Health & Sanitation
  - Health care access & practices
  - Disease exposure
  - Hygiene & toilet access
  - Water & food safety
  - Diet quality & diversity

**Individual**

- Individual Nutrition Status
- Food Consumption
  - Energy intake (kcal)
  - Nutrient intake (micronutrients)
- Food Utilization
  - Health status (e.g. comorbidities)
Radimer’s Food Insecurity Severity Spectrum Framework

Mild food insecurity

Moderate food insecurity

Severe food insecurity

Worrying about how to procure food

Compromising on quality and variety

Reducing quantity, skipping meals

Experiencing hunger

---

The Food Insecurity Experience Scale (FIES) Composition

Q1

Mild food insecurity

Worry about running out

Q2

Moderate food insecurity

Compromise on quality and variety

Q3

Q4

Q5

Q6

Q7

Q8

Severe food insecurity

Reduce quantity & skip meals

Experience hunger

“During the last [4 weeks], was there a time when, because of a lack of money or other resources...”

<table>
<thead>
<tr>
<th>WORRY</th>
<th>Quality</th>
<th>Quantity</th>
<th>Hunger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>You were <strong>worried</strong> you would not have enough food?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q2</td>
<td>You were unable to eat <strong>healthy &amp; nutritious</strong> foods?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q3</td>
<td>You ate only a <strong>few kinds</strong> of foods?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q4</td>
<td>You had to <strong>skip a meal</strong>?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q5</td>
<td>You <strong>ate less</strong> than you thought you should?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q6</td>
<td>Your household <strong>ran out</strong> of food?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q7</td>
<td>You were <strong>hungry</strong> but did not eat?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q8</td>
<td>You went <strong>without eating for a whole day</strong>?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategy</td>
<td>FG1</td>
<td>FG2</td>
<td>FG3</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>-----</td>
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</tr>
<tr>
<td><strong>DIETARY CHANGE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rely on less preferred or lower-quality food</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Eat fewer kinds of food</td>
<td>2</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td><strong>INCREASE SHORT-TERM FOOD AVAILABILITY</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Borrow money or food or eat on credit</td>
<td>4</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Ask for food from family in the village</td>
<td>4</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Beg for food/money (from church, on street)</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Steal, cheat, &quot;hustle&quot; (men only)**</td>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>Gather wild foods (e.g. dodo or wild yams)</td>
<td>-</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Gather food from trash</td>
<td>-</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Seek &quot;bad&quot; work (e.g. sex work, women only)**</td>
<td>3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>DECREASE NUMBER OF PEOPLE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Send children to eat with neighbors/friends</td>
<td>4</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>RATIONING STRATEGIES</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduce portion size</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Adults eat less so children can eat</td>
<td>3</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>Skip meals</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Go entire day without eating</td>
<td>3</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>Question</td>
<td>Description</td>
<td>Times/week</td>
<td>Weight</td>
</tr>
<tr>
<td>----------</td>
<td>-------------</td>
<td>------------</td>
<td>--------</td>
</tr>
<tr>
<td>Q1</td>
<td>Rely on lower quality or less expensive food?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q2</td>
<td>Ask for food to be sent here (help from the village)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q3</td>
<td>Reduce the variety of foods that you ate?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q4</td>
<td>Borrow food or money from a friend or relative?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q5</td>
<td>Limit portion size at mealtimes?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q6</td>
<td>Reduce number of meals eaten in a day?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q7</td>
<td>Gather wild foods that are growing in public areas?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q8</td>
<td>Send children away to eat elsewhere?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q9</td>
<td>Restrict consumption by adults so children can eat?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q10</td>
<td>Go entire days without eating?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q11</td>
<td>Beg for food or money?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q12</td>
<td>Gather food from the trash or street?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## How Prevalent is Household Food Insecurity in Kampala (n=500)?

<table>
<thead>
<tr>
<th>Indicator</th>
<th>% Food Insecure</th>
<th>Range of Possible Values</th>
<th>Mean</th>
<th>SD</th>
<th>CV</th>
</tr>
</thead>
<tbody>
<tr>
<td>HFIAS</td>
<td>80.3</td>
<td>0-27</td>
<td>9.5</td>
<td>7.3</td>
<td>0.77</td>
</tr>
<tr>
<td>HHS</td>
<td>38.0</td>
<td>0-6</td>
<td>0.8</td>
<td>1.2</td>
<td>1.51</td>
</tr>
<tr>
<td>FIES</td>
<td>79.8</td>
<td>0-8</td>
<td>4.3</td>
<td>3.0</td>
<td>0.69</td>
</tr>
<tr>
<td>CSI</td>
<td>88.6</td>
<td>0-224</td>
<td>17.9</td>
<td>11.5</td>
<td>1.08</td>
</tr>
<tr>
<td>rCSI</td>
<td>85.2</td>
<td>0-56</td>
<td>7.9</td>
<td>8.5</td>
<td>0.64</td>
</tr>
<tr>
<td>SAFS Binary</td>
<td>59.2</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>MIFA</td>
<td>58.4</td>
<td>0-12</td>
<td>2.6</td>
<td>3.7</td>
<td>1.43</td>
</tr>
<tr>
<td>HDDS</td>
<td>N/A</td>
<td>0-9</td>
<td>9.2</td>
<td>2.0</td>
<td>0.21</td>
</tr>
<tr>
<td>FCS</td>
<td>34.6</td>
<td>0-56</td>
<td>53.2</td>
<td>19.4</td>
<td>0.37</td>
</tr>
</tbody>
</table>
Histograms of Raw Scores by Indicator

- HFIAS
- FIES
- HHS
- CSI
- rCSI
- MIFA
- HDDS
- FCS
How Much Food Insecurity? How Severe?

Food Insecurity Experience Scale (FIES) – 8-Item Scale, Universal, Unweighted
How Much Food Insecurity? How Severe?

Coping Strategies Index (CSI) – 12-Item Scale, Context-Specific, Weighted

Mean = 17.73
Std. Dev. = 15.831
N = 500
How Much Food Insecurity? How Severe?

Household Diet Diversity Score - No. of Food Groups, Unweighted
How Much Food Insecurity? How Severe?

Food Consumption Score - No. of Food Groups, Weighted

Mean = 53.06
Std. Dev. = 19.319
N = 496
Frequency of Household **Coping Strategy** Use by Type of Strategy (n=500)
Item Characteristic Curves for Coping Items in 2 Parameter Logistic Model (2PL)
Coping Behaviors Along the Food Insecurity Spectrum

**Mild**
- Eat less-preferred foods (e.g. maize *posho*)

**Moderate**
- Eat more varieties of staple foods
- Leave out meal components
- Borrow food/cash from friends
- Borrow from shopkeeper
- Borrow from savings co-op
- Eat smaller portions (adults)

**Severe**
- Eat poor food (e.g. cassava flour porridge)
- Leave out meal components
- Borrow from shopkeeper
- Borrow from savings co-op
- Eat smaller portions (children)
- Skip lunch or supper
- Skip lunch & supper

**Extreme**
- Eat snacks/leftovers
- Consume nothing
- Ask church
- Beg on street
- Steal / sex work

**“Eat less”**
- Eat smaller portions (adults)
- Eat smaller portions (children)

**“Skip meals”**
- Skip breakfast and/or tea
- Skip lunch or supper
- Skip lunch & supper

**“Go a day without eating”**
- Eat snacks/leftovers
- Consume nothing

**“Borrow”**
- Borrow food/cash from friends
- Borrow from shopkeeper
- Borrow from savings co-op

**“Beg”**
- Ask church
- Beg on street
- Steal / sex work
Item Characteristic Curves for CSI, FIES, HFIAS Items

- Inadequate Quality (green)
- Insufficient Quantity (yellow)
- Instability (blue)
- Social Unacceptability (red)

Mild food insecurity  Theta (Food Insecurity)  Extreme food insecurity
Why is Accuracy in Measurement Important?

<table>
<thead>
<tr>
<th>If we identify a family as...</th>
<th>...when in reality the family is...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Secure</td>
<td>Food Secure</td>
</tr>
<tr>
<td>Correct Identification</td>
<td>Incorrect (Type II Error)</td>
</tr>
<tr>
<td>Food Insecure (Hungry)</td>
<td>Incorrect (Type I Error)</td>
</tr>
<tr>
<td>Correct Identification</td>
<td>Correct Identification</td>
</tr>
<tr>
<td>HHS</td>
<td>FCS</td>
</tr>
<tr>
<td>------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td></td>
<td>Acceptable</td>
</tr>
<tr>
<td>Little or no hunger</td>
<td>55.1% (274)</td>
</tr>
<tr>
<td>Moderate hunger</td>
<td>9.7% (48)</td>
</tr>
<tr>
<td>Severe hunger</td>
<td>0.6% (3)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>65.4%</th>
<th>28.6%</th>
<th>6.0%</th>
<th>100.0%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>325</td>
<td>142</td>
<td>30</td>
<td>497</td>
</tr>
</tbody>
</table>
# Cross-Classification of Household Food Insecurity Access Scale (HFIAS) and Food Consumption Score (FCS) Categories

<table>
<thead>
<tr>
<th>HFIAS</th>
<th>FCS</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acceptable</td>
<td>Borderline</td>
</tr>
<tr>
<td><strong>Food Secure</strong></td>
<td>15.6%</td>
<td>3.6%</td>
</tr>
<tr>
<td></td>
<td>(77)</td>
<td>(18)</td>
</tr>
<tr>
<td><strong>Mildly Food Insecure</strong></td>
<td>4.7%</td>
<td>0.8%</td>
</tr>
<tr>
<td></td>
<td>(23)</td>
<td>(4)</td>
</tr>
<tr>
<td><strong>Moderate/Severely Food Insecure</strong></td>
<td>45.4%</td>
<td>23.9%</td>
</tr>
<tr>
<td></td>
<td>(224)</td>
<td>(118)</td>
</tr>
<tr>
<td></td>
<td>65.6%</td>
<td>28.3%</td>
</tr>
<tr>
<td></td>
<td>(324)</td>
<td>(140)</td>
</tr>
</tbody>
</table>
Methodological Considerations

• Enumerator bias (household selection to participant engagement)
• High contact rate (87.3%) = coverage bias (e.g. few shacks represented)?
• Youth & children represented through adult accounts
• Gender bias
• No socio-behavioral research ethics committee = IRB ‘tennis elbow’
• Tablet pros (accuracy, GPS data) and cons (charging, social desirability bias)
• Language & culture, e.g. ‘food’ and ‘meal’ lack local equivalents
• Response drift
• Sampling design in slums
Remaining Questions

1. **RURAL to URBAN?** Are supposedly ‘universal’ survey instruments [that were calibrated/validated in primarily rural areas] contributing to systematic bias in survey data? How to reconcile the need for truly universal datasets with need for context specificity in urban and peri-urban environments?

2. **ARE WE SPEAKING THE SAME LANGUAGE?** Does it matter if universal instruments don’t “translate” perfectly into local cultural & linguistic contexts? How should we interpret our data across contexts?

3. **DECISIONS, DECISIONS...** How can [experts & non-experts] make more informed decisions about the choice of measure/s, and most importantly, how to use multiple measures together to triangulate & validate.

4. **SYSTEMS THINKING.** What are the best approaches for measuring linkages between urban, peri-urban, and rural households? What do “networked” urban households look like and how do we capture this concept?

5. **SOCIAL ACCEPTABILITY & RESPONSE DRIFT.** How can we better account for socially unacceptability in food security analysis? How might response drift complicate efforts to capture social/cultural dimensions?

6. **FOOD SAFETY...** Is a core dimension of food insecurity yet it is widely absent from measurement frameworks, particularly at the household level. What technological innovations are needed?
### Resources on the FIES, CSI, and More

- **Integrated Phase Classification Technical Guidelines 2.0 (2012)**
- **Integrated Phase Classification Technical Guidelines 2.0 Addendum (2016)**


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