What works where and for whom?
Farm Household Strategies for Food Security across Uganda

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Objectives
1. Understand how on- and off-farm activities of Uganda’s rural households contribute to their food availability.
2. Identify how food availability and its relationship with different activities vary across Uganda.

Methods
Data sources
Agricultural household survey data from the World Bank LSMS-ISA with 1927 households across Uganda (Figure 1)

Data analysis
1. Household food availability
We used a production and cash balance based food availability (FA) indicator (Figure 2):

\[
FA = \frac{\text{produce consumed & food purchased}}{\text{household energy need}}
\]

2. Regression analysis
Regression models (linear & zero-inflated beta distribution) explain variability of food availability and contributing activities using environmental factors as explanatory variables

3. Spatial interpolation
Kriging of regression residuals identified spatial patterns

Results (Objective 1)

<table>
<thead>
<tr>
<th>Explained variable Y</th>
<th>Explaining variables*</th>
<th>Squared correlation fitted &amp; observed Y (AICini− AICfin)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Food availability</td>
<td>LGP, Tmin, warmest month, Pmax, Cmax = mean carbon stock, Ppop = population density, Distribchicken = distribution of chicken, Distribpigs = distribution of pigs</td>
<td>0.076***</td>
</tr>
<tr>
<td>2 Off-farm income contribution</td>
<td>Twarmest, Pchicken</td>
<td>0.028 77</td>
</tr>
<tr>
<td>3 Banana contribution</td>
<td>Twarmest, Pchicken</td>
<td>0.36 979</td>
</tr>
<tr>
<td>4 Maize contribution</td>
<td>Twarmest, Pchicken</td>
<td>0.037 146</td>
</tr>
</tbody>
</table>

* Optimized by R-Squared

Temperature and precipitation explain part of the variability of banana contribution to food availability (Table 1)

• Food availability and off-farm income contribution (Figure 4 & 5): Spatial patterns but a high uncertainty (data not shown)
• Banana and maize contribution (Figure 6 & 7): Strong spatial patterns and a lower uncertainty (data not shown)

Results (Objective 2)

Conclusions
• Contributing off-farm activities increase in importance with increasing food availability, while contributing crop consumption decreases (Fig. 3)
• Food crops (banana and maize) show larger scale patterns, while short-distance variability of food availability and of off-farm income contribution is large introducing uncertainty in the maps (Fig. 4-7)

Next step: Use spatial information to determine the effects of agricultural interventions on food security across Uganda

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