Food system analysis of the Arua district, Uganda

West Nile Innovation hub seminar

July 21, 2021, Huib Hengsdijk and Robert Kajobe

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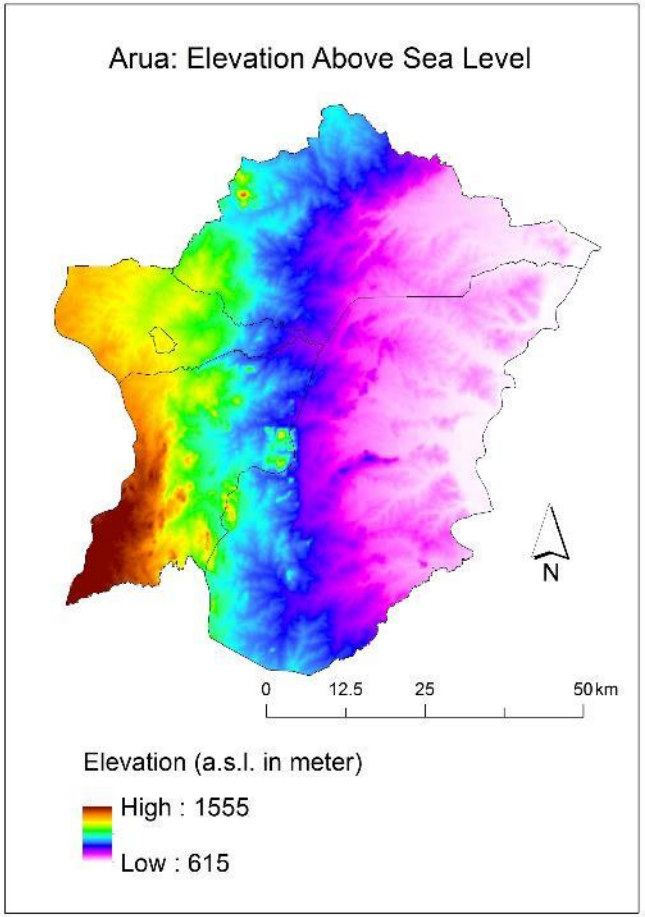
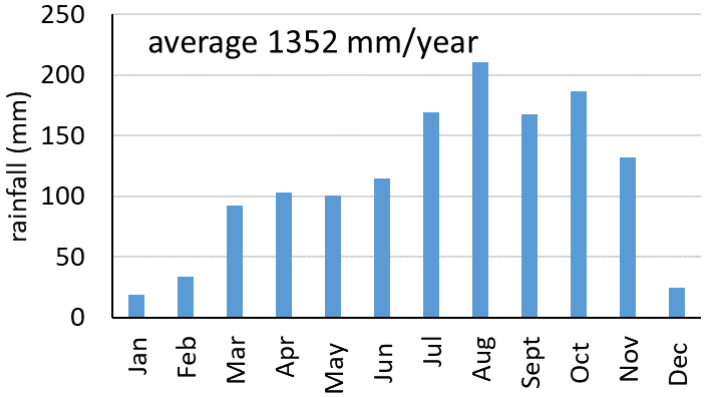
Food system analysis of the Arua district

1. Introduction to Arua food system
    - Characteristics of Arua district
    - Food system concept: outcomes, drivers & activities
2. Arua food system outcomes, drivers & activities
3. Challenges for the Arua food system
4. Options and knowledge questions to improve agricultural production and diversity
5. Conclusions

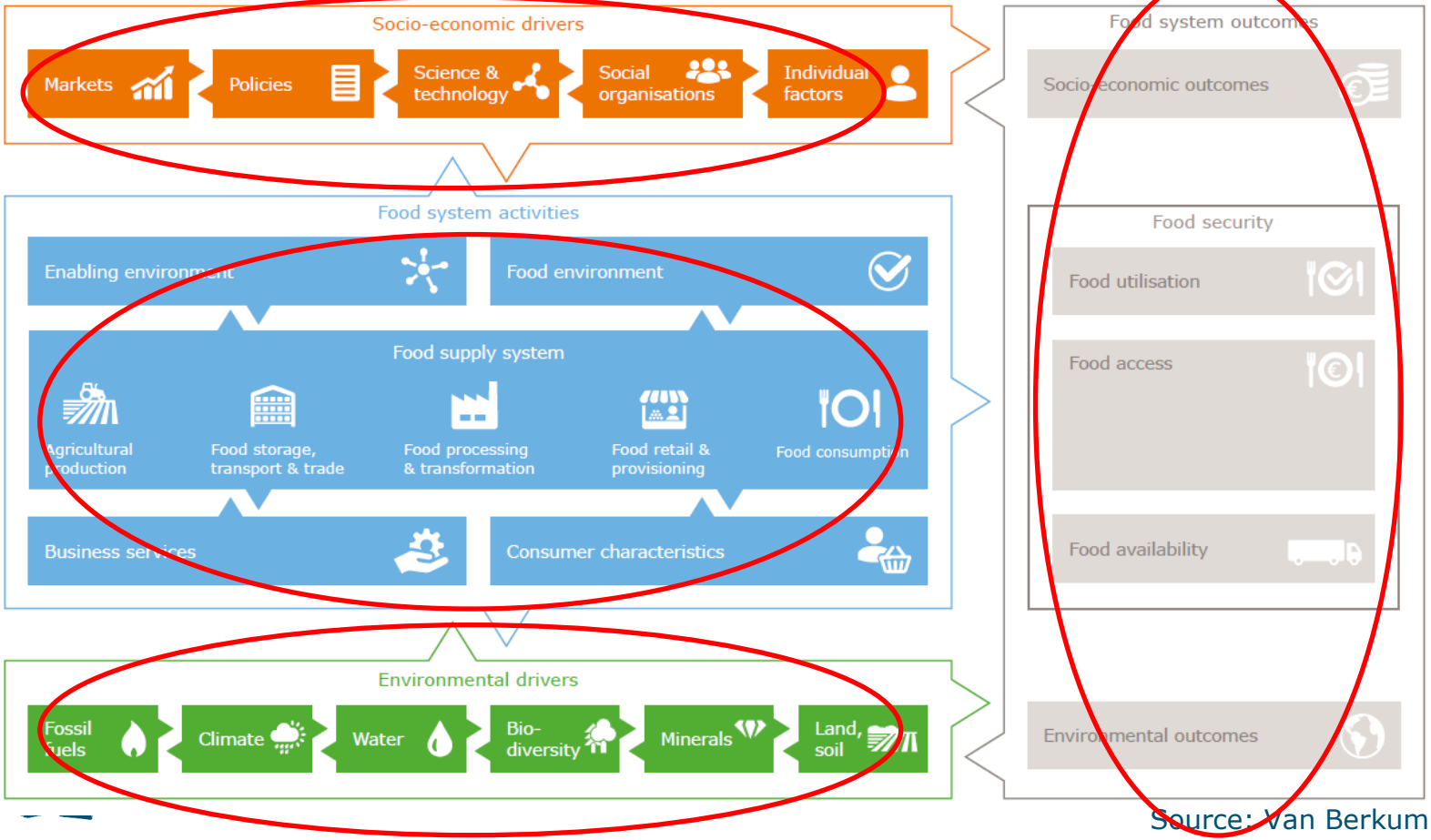
Major characteristics of Arua district



- Total area: ≈ 440,000 ha (1,1 million acre)
- Population: ≈ 1.1 million (including ≈ 20% has a refugee status)
- Agricultural employment ≈ 70%
- Main activity: Subsistence agriculture
- Elevation: 615 – 1555 m



2. Food system concept



Source: Van Berkum et al. 2018

1. Arua: Food outcomes

- 71% of population in host communities face moderate to severe food insecurity in N Uganda, against 89% of the refugee population.
- global acute malnutrition >10% children < 5 yrs in host communities.
- Per capita calory intake < 1750 Kcal/day (≈ 2100 Kcal/day required).

Consequences of low food & nutrition intake:

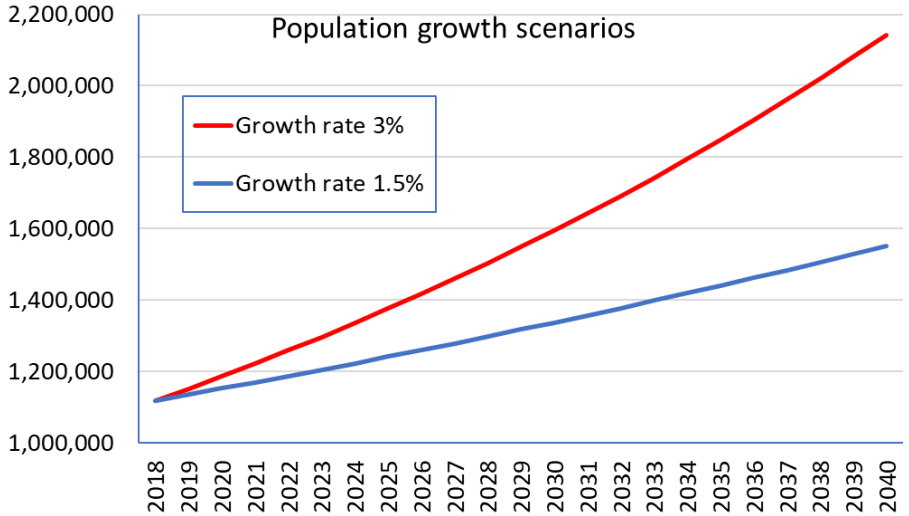
- Low labor productivity & increased disease incidence
- Stunted physical growth & impaired cognitive development of children

Source: FAO & OPM, 2018; FSNA, 2018

2. Arua: Socio-economic drivers

Major driver is the increase in population:

- population will double > 2 million (current growth rate of 3%)
- Population will increase with > 400,000 (growth rate of 1.5%)

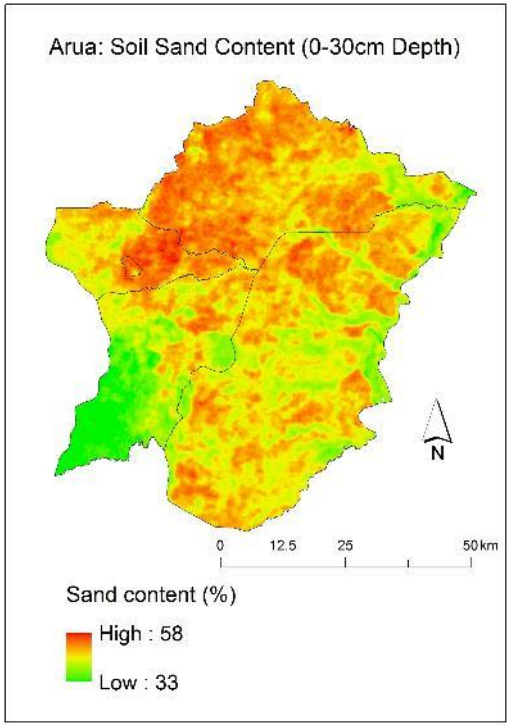


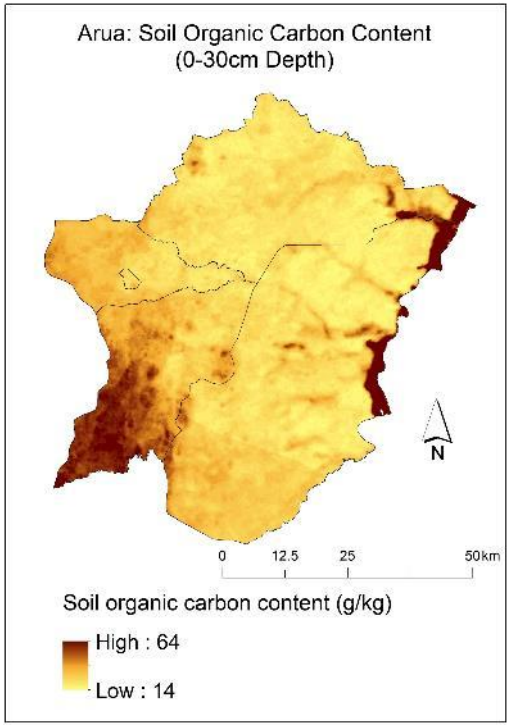
2. Arua: Socio-economic drivers (cont.)

- From food aid to cash-for-food programs (refugees)
- What does this mean for the Arua food system?
    - Increased demand for food on local markets
    - More own food production by refugees resulting in more demand for agricultural inputs and food supply
    - Land conflicts?

3. Arua environmental drivers: Soil database

- **Low soil organic matter** content in large parts of Arua
- **High sand** content, especially in North western part
- Combination of both indicates at **low soil fertility** in many parts



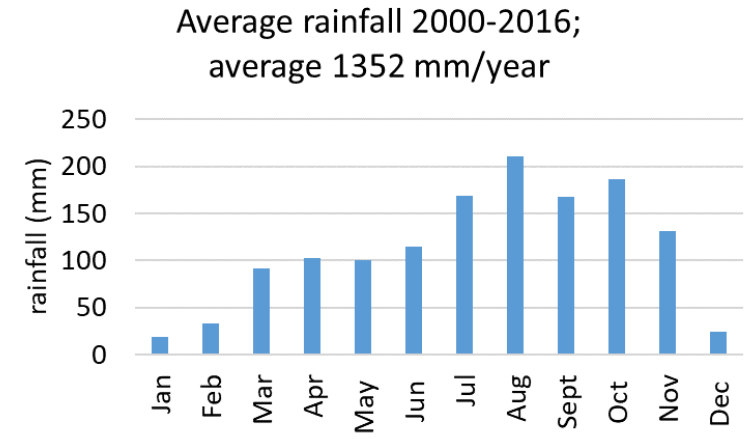


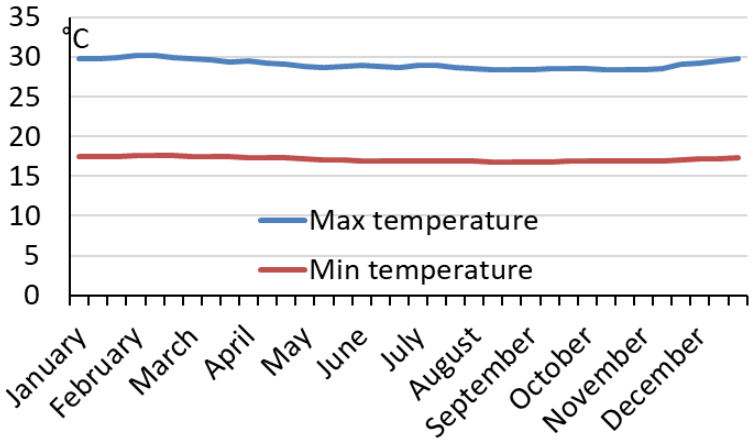
3. Arua environmental drivers: Climate (cont.)

- Climate: Equatorial savannah with dry winter
- Temperature and rainfall: relatively favourable allowing 1 or 2 crops per year

Possible effects of climate change:

- Higher temperatures reduce yields
- More variable rainfall, only one growing season?
- More pests & diseases?





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4. Arua: Food system activities

- Predominant subsistence agriculture, focussed on staple crops with low crop yields, far below national average

Yield in t/acre	Arua	National
Cassava	3.7	9.0
Sweet potatoes	2.7	12.0
maize	1.1	3.0

- Lack of improved seeds, fertilizers, pesticides, irrigation and skills to increase and diversify production.
- Low diversity in local diet, mainly staples with little nutrient dense foods such as animal products, fruits and vegetables.

4. Arua: Food system activities (cont.)

Consequences of low and little diverse agricultural production:

- No surplus food production to deal with increased demand because of growing population
- Unbalanced diets
- Limited food processing capacity
- Low labor productivity
- Agriculture can **not** be the engine of economic growth as long as no food surpluses are produced that can be traded and processed.

Key challenges of the Arua food system

1. How to provide a healthy diet to all, now and in the future? Especially in face of population growth
2. How to increase and diversify agricultural production to:
    - Supply sufficient and nutritious food
    - Mobilize agriculture as engine of economic growth

Key challenges of the Arua food system

Changes needed in different parts of the food system, such as:

- Consumers: eat more balanced and healthy diets
- Markets: improving availability and affordability of food
- Production: more production and more diversified production
- Service sector: improve input provision and advisory services
- Policy: incentives, setting R&D agenda, support local initiatives for changes in the food system

Options to improve and diversify agricultural production

Basically, there are four options to increase agricultural production:

1. Expand the current cropping area;
2. Increase the production frequency, i.e. increase the number of growing seasons per year;
3. Increase agricultural productivity, i.e. increase the production per unit of land; and
4. Reduce post-harvest losses.

Knowledge questions for expanding the cropping area:

- How much land is still available for agriculture in Arua?
- What is production potential (soil fertility) of new agricultural land?
- What are competing claims: land for fire wood, livestock ranching?
- What are possible consequences of land reclamation for agriculture: GHG emissions, erosion, biodiversity loss, land ownership, etc?

Knowledge questions for increasing the production frequency:

- Careful planning of cropping calendar according seasonal weather forecasts. Are such weather forecasts available and accessible?
- Access to irrigation water to produce in dry season: Where is water available? How much water is available?
- How does water extraction for irrigation affect other water users?
- How to avoid soil salinity problems in irrigated land?

Knowledge questions for increasing agricultural productivity:

- Which inputs are needed?
- Are inputs available at the markets?
- Are inputs financially affordable for farmers?
- Farmers have the knowledge to apply inputs efficiently?
- Higher input use result in environmental pollution?

Knowledge questions for reducing post-harvest losses:

- Where in the supply chain are losses highest?
- How is crop harvest and handling?
- How are logistics arranged?
- What is the storage capacity for perishable products?
- Improved storage options economically viable?

Conclusions

1. Start with ‘reverse thinking’: what type of agriculture is needed for a healthy diet and other desirable food outcomes (‘targets’)?
2. Various options available to improve and diversify food production in Arua for a healthy diet.
3. Each option needs careful consideration, identification of **feedback loops and trade-offs** by identifying proper research questions, e.g.
    1. Land for agriculture *vs.* land for providing other services?
    2. Negative externalities of intensification?

Conclusions

4. Limit trade-offs and anticipate in an early stage for potential negative feedbacks.
5. Wicked problems require sometimes wicked choices.
6. Monitoring and risk reduction strategies increase preparedness for adjustment of interventions.
7. Integrated and multi-disciplinary visions and knowledge are needed to develop effective food systems interventions. They need to be joint efforts.

Thank you

Questions and remarks?