

Applying systems thinking to understand Kenya's nutrition transition

Table talk #260

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Conference proceedings – Table Talk #260; José Izcue Gana, MD, MSc

Introduction: Kenya is currently undergoing a *nutrition transition*, shifting from traditional diets with minimally processed staples toward "Western" diets rich in processed foods. This shift contributes to a triple burden of malnutrition, where micronutrient deficiencies and caloric undernutrition coexist with rising rates of obesity. Despite the emergence of technical regulatory frameworks like the *Kenya Nutrient Profile Model 2025*, implementation remains uneven because coordination gaps, infrastructural challenges, and industry resistance.

Recognising that dietary patterns are not isolated individual behavioural choices, but the result of interacting social, cultural, environmental, commercial, and other (often non-linear) influences, we applied systems thinking to study the rise of unhealthy diets in Kenya. Our aim was to develop a shared understanding of the causes and consequences of the nutrition transition in Kenya and generate insights that can inform effective food and nutrition policies.

Methods: We recruited a multidisciplinary group of 16 stakeholders, including local policymakers, academics, representatives of grassroots organisations, media, and from the food retail sector, to participate in Group Model Building (GMB) sessions. Our study was conducted in Kisumu, Kenya's third-largest city, and an important industrial and public health hub.

The process followed five stages:

1. **Problem Framing:** We framed the "rise in unhealthy diets" as a *coordination problem*. The purpose was to align the understanding and actions of people in multiple sectors (i.e. 'the problem persists because of conflict amongst actors').
2. **First GMB workshop:** We elicited 40 variables and used *connection circles* to build preliminary *Causal Loop Diagrams* (CLDs).
3. **Research team sense-making:** We aggregated these initial diagrams into a unified model, refining variable names and identifying additional implicit causal links (*Vensim*).
4. **Second GMB workshop:** Stakeholders reviewed the updated CLD, added a few new variables, system delays, and identified leverage points for intervention.
5. **CLD Analysis:** We used *Kumu* software to clean the final map, which contained 66 variables and 32 feedback loops. We identified system archetypes and leverage points based on key map nodes and feedback loops. We compared these to the leverage points identified by stakeholders.

Results: Our final CLD revealed three primary subsystems that drive dietary change:

- **Health, Governance, and Commercial Determinants:** We identified a "commercial determinants pathway" where the consumption of unhealthy foods drives profits, which are then reinvested into more outlets and advertising (reinforcing loops R1, R2). This is balanced by a "nutrition policy pathway" (balancing loops B1, B2), where rising NCD mortality and healthcare costs eventually trigger government policies including more nutrition education. We found this dynamic resembles a "limits to growth" archetype, where policy serves as a (delayed) balancing mechanism on consumption of unhealthy foods.
- **Socio-Cultural Influences:** Cooking at home reinforces cooking skills (R3), which reduces unhealthy food intake. But this is undermined by a preference for processed

foods and the perception of indigenous foods as "backwards," driven by peer pressure among youth. A "shifting the burden" archetype emerged through pathways connecting this part of the diagram to the Health, Governance, and Commercial Determinants section. Policy responses prioritising nutrition education 'shift the burden' to individual responsibility, whilst structural drivers –such as the rapid expansion of supermarkets and the commercialisation of the food supply– remain mostly unaddressed.

- **Agriculture and Population Dynamics:** We found that government support for commercial, market-oriented agriculture (as opposed to traditional/subsistence) is driven by the belief that it alleviates poverty through economic growth (R4). However, this may create a "fixes that fail" archetype. Agricultural intensification leads to soil erosion and nutrient depletion (B4), while mechanization reduces rural jobs, accelerating rural-to-urban migration and urban encroachment onto arable land (B5).

During the "places to intervene" exercise, stakeholders identified nutrition education, cooking skills, and the promotion of urban kitchen gardens as high-impact, feasible leverage points. There was considerable overlap between the leverage points identified by stakeholders and our later CLD analysis. Both stakeholders and the research team analysis recognized rural-to-urban migration and agricultural mechanisation as key system drivers but deemed these as unfeasible to manipulate or control.

Discussion: While stakeholders identified nutrition education and urban kitchen gardens as primary leverage points, regional literature suggests these interventions act more as supplementary enablers rather than standalone solutions. Other research shows that nutrition education can improve knowledge, but it requires a supportive regulatory environment to translate into behavioural change. Similarly, evidence from studies in Nairobi indicate that while kitchen gardens improve dietary diversity, urban households remain heavily dependent on purchased food, possibly limiting the impact of greater emphasis on these as a policy.

The transition may ultimately reflect a shifting the burden archetype, as explained in the results. A focus on individual-level education and an attempt to displace unhealthy diets through more access to fresh foods from kitchen gardens only partially addresses the structural dominance of unhealthy foods in the broader retail environment. In upper-middle and high-income countries, a combination of health policies helps limit consumption of unhealthy (ultra-processed) foods, but *market saturation* is sometimes the strongest balancing mechanism.

The next steps of this project will involve developing a System Dynamics model to test the proposed policies and alternatives to address the rise of unhealthy diets in Kenya.

Causal Loop Diagram – The nutrition transition as seen by key stakeholders in Kenya

