World Agroforestry Centre

Modelling the Impacts of Uganda's Vision 2040 Policy on Household Nutrition

Photo 1. Expert groups were invited for a workshop to discuss the decision and design a model structure. Expert knowledge and scientific literature are used to provide estimates for the values used in the final calculation of the model. Photo by Cory Whitney.

Key Messages

- Modelling the uncertainties in proposed interventions can help policymakers understand the impact of agricultural decisions on household nutrition

- Decision modelling can help Uganda's Vision 2040 development agenda align with the aim to end hunger and malnutrition

- Vision 2040 should consider how the proposed farm industrialization could affect the main factors that influence household nutrition – access to and demand for healthy food

Vision 2040 - New Development Agenda for Uganda

The Ugandan Government's long-term development agenda, "Vision 2040" calls for "A Transformed Ugandan Society from a Peasant to a Modern and Prosperous Country within 30 years" (NPA 2007 p. 3). The measures that follow Vision 2040 aim to address poverty, food insecurity and malnutrition in the country.

However, it remains unclear how this transformation will influence nutrition outcomes at the household level. The agenda seeks to shift Uganda's agricultural systems from homegardens to industrial farms, which could have a negative effect on household nutrition.

Model calculations, based on the best available knowledge from scientific literature and experts, indicate that malnutrition at the household level is strongly influenced by access to and demand for healthy food and less by the total food supply. To create an agricultural agenda that directly addresses household nutrition, the government should consider programmes for nutrition education, as well as the role of small-scale agricultural systems such as homegardens in providing diverse and year-round foods.

Addressing Hunger and Malnutrition in Uganda – the Challenge of Selecting Interventions that Work

Several possible interventions have been identified under Vision 2040 with the aim of alleviating hunger and malnutrition in Uganda. Many of these interventions seek to target agricultural production. The challenge for the government now is to choose the most effective of all the possible options, since some of those proposed may not produce desired outcomes. For instance, certain foods that are produced in industrial farming systems may never reach vulnerable groups, such as the rural poor.

Applying a Modelling Approach to Policy Decisions

A Bayesian Network is a modelling tool that can be used to anticipate future impacts of decisions, accounting for the uncertainties in our knowledge. Our team of researchers used this tool to model the possible changes to agriculture for nutrition under Vision 2040.

We used collaborative methods with local experts and decision analysts to develop a Bayesian Network of the decision to implement Vision 2040 vs. maintaining smallholder homegarden systems. The aim of the modelling approach and final outcome model was to describe the likely future changes in hunger and micronutrient deficiency under Vision 2040. The model output also indicates our degree of certainty in the projected outcomes.

Figure 1. Qualitative overview of a model describing the agricultural interventions under Vision 2040 and their effects on household nutrition in Uganda.
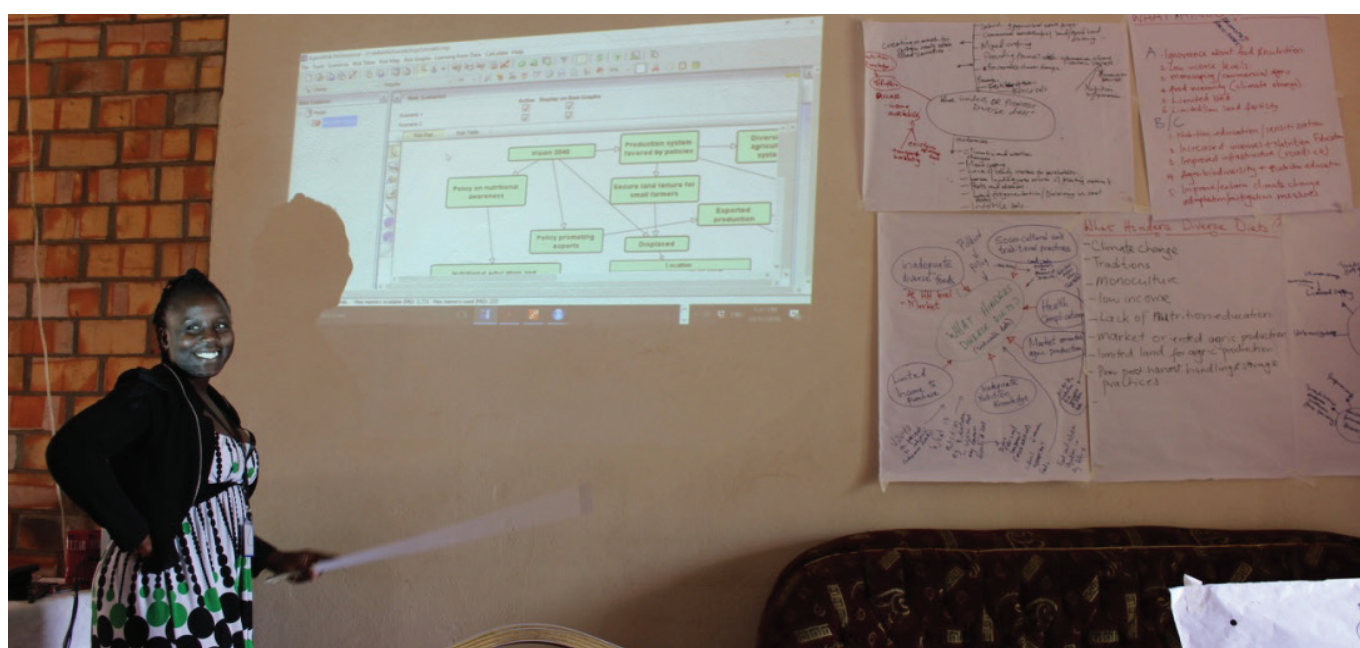

Photo 2. The written work of the expert groups is programmed into a digital model, which is then further discussed and reviewed by the experts. Photo by Cory Whitney.

Both the model design and the calculation of the model results helped researchers and experts to identify the consequences for household nutrition in Uganda. A forthcoming paper describing the process and model is included in a special issue of Earth's Future (Whitney et al. 2018). The model is available in the Harvard DataVerse (Luedeling and Whitney 2017).
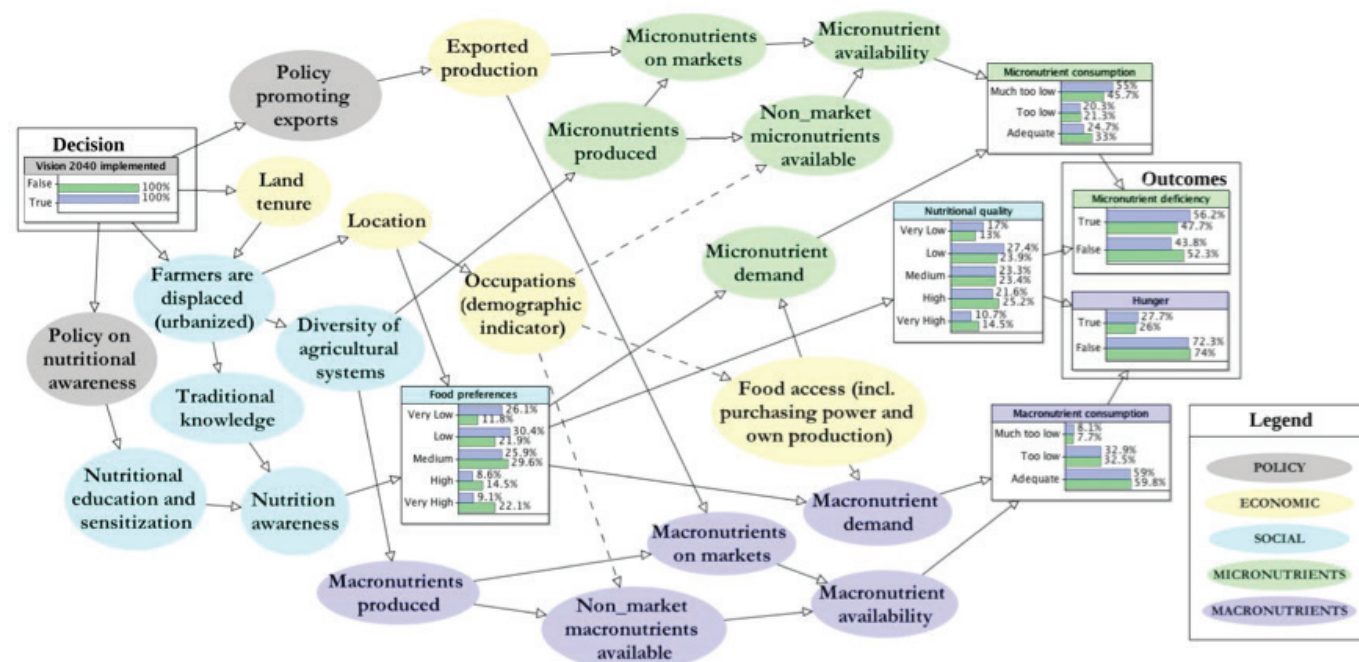

Figure 2. A Bayesian Network of agricultural interventions under Vision 2040 and their effects on household nutrition in Uganda. Probabilities are shown (in boxes) for nutrition outcomes and for the most sensitive parts of the model. The green bars indicate probabilities for a future scenario, in which the Vision 2040 decision is not implemented and the blue bars show probabilities for the scenario where Vision 2040 is implemented.

Vision 2040 May Have Unintended Impacts on Nutrition

The Bayesian Network model shown in Figure 2 indicates that the implementation of Vision 2040 creates a worrying increase in the probability of a household experiencing hunger and micronutrient deficiency.

The results call into question the desirability of some of the agricultural changes proposed in Vision 2040. If the agricultural development plans are implemented, there is no guarantee that the former homegardeners, who leave their farms behind, will be able to purchase the food that is produced by industrial agriculture. Instead, many former homegardeners may transform from rural farmers with access to diverse diets to urban poor with limited food access.

The industrialization of the nation's agriculture under Vision 2040 risks doing away with many, if not most, small-scale farms and homegardens of the country.

This process could lead to the urbanization of rural communities, which in turn could have a negative impact on nutrition outcomes for households by eliminating their easy access to diverse foods. Model calculations show that malnutrition at the household level is strongly influenced by access to and demand for healthy food and less by the total food supply.

There is a risk that the agricultural development aspects of Vision 2040 may not be coherent with the intended aim to solve the national problems of poverty and nutrition. In this way Vision 2040 may be inconsistent with the national nutrition action plan (NPA 2011). Furthermore, there is a risk that Uganda's commitment to SDG 2 (NPA 2017), to end hunger and food insecurity, as well as the Scaling Up Nutrition (SUN) movement for a world free from malnutrition, may also be undermined by Vision 2040.

Policy Recommendations

The Vision 2040 agenda has the commendable aim of addressing poverty, food insecurity and malnutrition in Uganda. Steps can be taken to make the agricultural development aspects of Vision 2040 coherent with Uganda's commitment to SDG 2 (NPA 2017) and policies such as the national nutrition action plan (NPA 2011).

Implementation of Vision 2040 should be carried out with awareness of the possible negative influences on nutrition outcomes at the household level. To support farming households, policy should seek to increase farm viability by sharing planting materials and practices for nutritional fruits and vegetables, and educating consumers about the nutritional value of eating these foods.

References

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