Nutritional Impacts of Transitioning from Homegardens to Industrial Farms in Uganda

Cory Whitney[1,2], Denis Lanzanova[1], Keith Shepherd[2], Eike Luedeling[1,2]

[1] *University of Bonn, Center for Development Research (ZEF), Germany*
[2] *World Agroforestry Centre (ICRAF), Kenya*

Abstract

Uganda's agriculture is currently confronted with a major government decision, set to transform the country's farming landscape. The national development plan (Vision 2040) calls for a transition from small-scale farming, which currently supports the majority of Ugandans, to large-scale commercial agriculture. While this plan is likely to boost staple crop production, its impacts on human nutrition have not been adequately explored.

Given its multifaceted and complex nature, an ex-ante evaluation of Vision 2040 requires the integration of knowledge and systems thinking from beyond the discipline-specific approaches that are often used. To this end, decision analysis, a decision-support approach from the private sector, offers tools for including 'intangible' factors that are important for the decision but difficult to measure. We applied Bayesian Networks (BN), a probabilistic causal modelling technique, for decision analysis concerning Vision 2040's impact on the nutritional situation of Ugandans. To project future supply of micro and macronutrients, we convened a team consisting of technical experts and potentially affected stakeholders to construct a BN impact model.

We used various group-work techniques to produce a consensus model that included the perspectives of all participants. To structure the analysis, participants identified five decision-relevant questions, relating to (1) dietary diversity, (2) human displacement, (3) expected changes in urban and rural diets, (4) future income prospects for displaced farmers and (5) changes in crop diversity.

For each question, team members designed graphical models that were then reconciled into one comprehensive model projecting the nutritional impacts of Vision 2040. The model was converted into a BN, which was parameterised with probability distributions elicited from participants. To ensure accuracy in this step, participants were trained in techniques aimed at reducing estimation bias (e.g. overconfidence). Results indicated little change in terms of macronutrient deficiency (Hunger) but a worrying increase in micronutrient deficiency (Hidden Hunger) with the implementation of Vision 2040.

The BN approach proved effective in generating a comprehensive working model of the implications of 'Vision 2040' for the nutritional status of households in Uganda. Such methodologies and model outputs hold promise for helping decision makers gain insight into the important linkages between nutrition and policy.

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Contact Address: Cory Whitney, University of Bonn, Center for Development Research (ZEF), Genscherallee 3, 53113 Bonn, Germany, e-mail: cory.whitney@uni-bonn.de