



# **Crop Commercialization and Nutrient intake among Farming Households in Uganda**

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## **Abstract**

Agricultural commercialization is seen as a pathway towards rural economic transformation as it is expected to enhance a wide array of household welfare indicators. This study examines the channels through which household nutrient intake is influenced in the process of crop commercialization. This was investigated using LSMS-ISA survey data for Uganda using the control function econometric approach. The results show that commercialization affects nutrient intake via crop income. Another crucial finding was that while rural-based households registered higher nutritional gains from crop commercialization,

they were less commercialized on average. The role of markets as a key factor in the agricultural commercialization process was confirmed; households that had access to produce markets are more commercialized and have better nutrient intake. While male-headed households were found to practice more commercialization, their households have less nutrient intake compared to their female-headed counterparts. This finding is in line with the literature and casts a shadow on the nutritional benefits of agricultural commercialization given that most households in Uganda are male headed. The findings point to two important implications. First, interventions geared towards agricultural commercialization are beneficial to household nutrition via income generation. As the findings showed that agricultural commercialization positively affects nutrient intake via income generation, this calls for proactive steps towards support for nutrition-sensitive commercial agriculture. This would ensure that nutrient rich food is easily available on the market. Second, while rural-based households are the primary target of the commercialization policy, the study found them less commercially oriented. Such households need support in the form of inputs and equipment to reorientate their production as farm capital was found to be a significant driver of commercialization.

## Introduction

The transition from subsistence to commercial agriculture has been proposed as key to socioeconomic transformation. The economies of scale associated with agricultural commercialization are expected to enhance efficiency in production, which in turn is expected to improve household income. Big gains from commercialization are expected, especially among rural households whose livelihoods are directly derived from agriculture. Household income, consumption, food security and nutrition are expected to improve as a result. Anticipating such benefits, many developing countries have embarked on agricultural commercialization as a growth strategy. In Uganda, objective three of the country's Agricultural Policy is to "promote specialization in strategic, profitable and viable enterprises and value addition through agro-zoning" (GoU, 2013). This is informed by the understanding that commodity specialization and agro-zoning strengthen agri-business, and enhance profitability and market access, leading to the creation of farm and off-farm employment. The creation of additional employment opportunities necessitates increased agricultural commercialization and the establishment of industries for adding value to agricultural products.

In the analysis of the nexus between agriculture and nutrition, the focus has mainly been on the link between on-farm production diversity and farm household diets (Sibhatu et al., 2015; Jones, 2017). However, such studies use household dietary diversity scores, which are suitable for measuring household food security but not dietary quality (Kennedy et al., 2013). Other literature has analyzed the effects of agricultural commercialization on household welfare in terms of income (Muriithi and

Matz, 2015). However, commercialization may impact income but not nutrient intake. For example, the risk associated with micronutrient deficiency cannot be identified if the analysis of the welfare effects is only restricted to income (Ecker and Qaim, 2011; Horton and Ross, 2003). In addition, even if the accrued income is allocated to food purchases, this may possibly change dietary quality by increasing calorie consumption but not necessarily micronutrients (Popkin et al., 2012). Furthermore, commercialization tends to cause changes in gender roles as men take charge of farm production as well as the accrued income (Von Braun and Kennedy, 1994; Ogotu et al., 2017). Evidence shows that agricultural income in male-controlled households is often spent on things other than those that improve household dietary quality (Fischer and Qaim, 2012).

While the drive towards commercialization has been accompanied by policy reforms to create competitive agricultural markets with the aim of improving household welfare, there are studies in the literature which emphasize that agricultural commercialization may not yield the desired welfare effects (Carletto et al., 2017; Herens et al., 2018). In Uganda, the debate on the welfare impacts of agricultural commercialization comes at a time when government policies and programmes in the agricultural sector, which have resulted in the expansion of commercial crop production, are being met with mixed reactions. Specifically, the potential for policies and programmes that focus on market-oriented agricultural production in improving income generation and household nutrition is being called into question. A case in point is the scaling up of sugarcane production, which has caused concern for increasing food insecurity and rising poverty as the extensive nature of sugarcane production requires considerable acreage of land for a farmer to break even. The resulting increase in demand for land has inevitably pushed households into allocating their entire landholdings to sugarcane, leaving almost none for food production (Mwavu et al., 2018).

Mwavu et al. (2018) show that households that chose to cultivate sugarcane were food insecure, as they were often short of the physical and economic access to sufficient food to meet their dietary needs (also see Koczberski et al., 2012; Mwavu et al., 2016). They found that home gardens in sugarcane-growing regions have been rapidly losing important and nutritious food crops like cowpeas, soya beans, aerial yams, and Bambara groundnuts, with dire implications for household food security and nutrition. Households were reportedly coping with food insecurity by resorting to offering labour in exchange for food, borrowing and rationing food, and at times using unsavoury survival strategies such as stealing from their neighbours (Mwavu et al., 2018).

Critics of commercial crops contend that the resources used to produce such crops would otherwise be used to produce food to improve nutrition and household food security (Koczberski et al., 2012; Mwavu et al., 2016). Conversely, others insist that the production of commercial crops can increase households' income which,

in turn, can improve nutrition. In their study of agricultural commercialization and nutrition in the Philippines, Bouis and Haddad (1990) found that smallholder sugarcane landowners made substantially higher profits per hectare than those that had opted for corn, following the establishment of sugar mills in their region. In the case of Uganda, the opposing views are focussed on the proposition that such commercialization has generally been detrimental to household welfare. This study therefore contributes to the agriculture-nutrition debate by investigating the link between commercialization and nutrient intake based on a nationally-representative dataset.

From the existing evidence on the commercialization-nutrition linkage, Von Braun et al. (1990), Headey (2012) and Kadiyala et al. (2014) identify six channels through which agricultural interventions can impact nutrition: i) agriculture as a source of food for own consumption, ii) agriculture as a source of income which can be used to purchase food, iii) agricultural policies that can influence prices of food and non-food crops, iv) the effect of women's social status and empowerment on their access to and control over resources, v) the impact of women's participation in agriculture on their time allocation, and vi) the impact of women's participation in agriculture on their own health and nutritional status and that of their household. Based on these channels, we use a framework by Von Braun et al. (1990) to hypothesize that both commercialization policies and programmes that the Government of Uganda has undertaken over the years are important determinants of household nutrition among farm households in Uganda.

This study therefore seeks to establish whether the different interventions towards commercialization have influenced household nutrient intake based on the following research questions: a) Does crop commercialization affect crop income? b) how does nutrient intake vary between urban and rural-based households? c) how does commercialization affect household nutrient intake? d) how do socioeconomic factors influence micro- and macro-nutrient intakes?

The overall objective of the study is to examine the effect of crop commercialization on household micro- and macro-nutrient intakes. In this regard, the study sets out to: i) Analyze the differences in macro- and micro-nutrient intakes between urban and rural households, ii) determine the relationship between crop commercialization and crop income, iii) analyze the nutrition impact pathways of agricultural commercialization and iv) determine the effects of crop commercialization on calorie and micronutrient intake from different food sources.

## Policy context of agricultural commercialization and nutrition

Sub-Saharan Africa and South Asia are the two regions of the world with the highest concentration of undernutrition (Gillespie et al., 2015). However, it is worth noting that the bulk of this under-nourished population primarily depends on agriculture. Agriculture is a critical sector in any attempt towards a sustained reduction in under-nutrition, yet there is mixed evidence on the channels through which its potential can be unleashed. Existing evidence reveals limited information on the wider political, institutional, and policy-related challenges relating to the agriculture-nutrition nexus (see Gillespie et al., 2015). In Uganda, the agricultural policy direction and interventions are derived from the National Agriculture Policy (NAP) of 2013 which seeks to orient the sector as private-sector led. All sector investments are guided by the Agriculture Development Strategy and Investment Plan (DSIP). This plan aims to enhance agricultural production and productivity, by improving access to and ensuring the sustainability of markets, thereby creating an enabling environment, and undertaking institutional reforms and development of the sector. The plan also promotes a commodity approach where value chain development is directed towards ten selected commodities within the different agro-ecological zones of the country.

Based on the foregoing policy environment, there have been several initiatives aimed at increasing agricultural production with a bias towards market-oriented production. For example, the Poverty Eradication Action Plan (PEAP) of 1997, whose activities were rooted in agriculture, was developed with the overall aim of enhancing rural incomes. Several revisions were made to the plan which later saw the emergence of the Plan for the Modernization of Agriculture (PMA) in 2000 as a second-tier policy framework to provide direction to agricultural-sector development in the country. The PMA was envisaged to turn agriculture into an engine that would contribute to income generation by raising farm productivity, increase the share of farm production that is marketed, and create off-farm and on-farm employment (Adong et al., 2014; Kasirye, 2013).

The National Agriculture Advisory Services (NAADS), which formed a pillar of the PMA, was a significant contributor towards agricultural commercialization through interventions such as input provision and advisory services to farmers in Uganda. The NAADS implementation strategy involves selecting a market-oriented farmer at parish level and a commercialized farmer at district and/or sub-county level plus nuclear farmers at the national level to ensure the provision of targeted farmer support towards commercialization (Adong et al., 2014; MAAIF, 2010). These selected farmers use their farms as demonstration sites for other farmers

to learn the recommended farming practices. The agency also supports farmers to get organized into groups along a common identifiable farming interest. This was done with a view to promote agricultural production based on a commercialization strategy.

Other interventions in the direction of agricultural commercialization include the Rural Development Strategy (RDS) and the Prosperity for All (PFA) programme. The objective of RDS was to stimulate agricultural production towards value addition and stable markets. Support was directed to farmer groups to ensure value addition and market stability, with the latter being achieved through the establishment of a commodity information system, enhancement of market access for agricultural products and facilitation of the delivery of agricultural inputs through the market. The RDS spanned the period 2005–2007 with its successor being the PFA whose aim is to ensure that all households earn a minimum of 20 million shilling (US\$6,000) annually through the effective selection of profitable farm enterprises.

The foregoing discussion highlights the attention which public policy in Uganda has paid towards agricultural transformation through the development of several strategies and initiatives aimed at making the sector commercially viable. However, while agriculture has the potential to reduce under-nutrition, this potential is yet to be realized (Ruel and Alderman, 2013; Gillespie et al., 2013; Balagamwala and Gazdar, 2013; Kadiyala et al., 2014). Evidence shows that the focus on market-oriented agriculture as reflected in the various initiatives, the limited multi-sectoral coordination, and the view that nutrition is more of a health than an agricultural matter has dampened the critical role of agriculture as a contributor to nutrition (Gillespie et al., 2015).

It is vital to note that if strategically harnessed, agriculture can deliver relatively high economic returns to investment with benefits to nutrition (Hoddinott et al., 2012; Ruel and Alderman, 2013). However, as Gillespie et al. (2015) observe, an increase in food production or even consumption does not automatically lead to improvements in final nutrition outcomes. As Herforth and Ahmed (2015) found, it can be the case that food that is easily available, affordable, and convenient is not necessarily aligned with optimal nutrition and health outcomes. Non-food factors such as poor sanitation, women's disempowerment, inadequate quality of health services and agriculture-associated diseases equally stand in the way of the realization of effective nutrition.

Contextualized research into the policy processes and the political economy of agriculture and nutrition is therefore needed to better characterize the “set-up” under which agriculture can benefit nutrition, and how such “set-ups” can be shaped and sustained. For example, in a comparative assessment of priorities and perceptions of malnutrition in Afghanistan, Levitt et al. (2009) found that both agriculture and health sector stakeholders differed consistently in defining the problem of malnutrition.

In East Africa, stakeholders identified the pathways from agricultural production to nutrition as income generation (the primary motivation behind the policy initiatives towards agricultural commercialization), household food production, education, and women's empowerment. Yet evidence suggests that this link is not too obvious (see Gillespie et al., 2015; Herens et al., 2018). In this study, we aim to contribute to filling the gap between the expected increase in agricultural production following commercialization policies and its potential for translation into improved nutrition. This is done by identifying the primary channel (among several) through which nutrient intake is affected following crop commercialization. We draw on evidence from Uganda and position it within the literature from other regions of the world on the agriculture-nutrition nexus.

## Data

The study uses data from the 2013/14 Uganda National Panel Survey (UNPS), which captured data on agricultural production, household food consumption and a range of other socioeconomic and community characteristics. The UNPS is a nationally representative dataset with information on the key variables contained in the household, agriculture, and community modules. The study focusses only on farming households (both rural and urban), defined as households that reported involvement in agricultural activities through ownership and/or cultivation of land and have non-zero crop production data.

## Conclusion and policy implications

While studies on agricultural commercialization show that it can improve productivity and income for farmers, evidence of its effects on household nutrition is not obvious. This study adds to the literature by not only analyzing household nutrient intake under commercialization, but also identifies the transmission channels by which the observed effects are realized. In this study, the summary statistics indicate that, on average, rural households have better nutrient intakes compared to their urban counterparts. In a review of Africa's agriculture, Christiaensen (2017) shows that while market participation remains widespread, the extent of agricultural commercialization is limited, without clear benefits for nutritional outcomes. In this paper, it was established that commercialization affected nutrition negatively in all indicators. This finding could be attributed to the fact that decisions regarding food consumption depended on several factors. For example, commercialization can increase real household income with the potential to enhance food consumption, which would then impact household nutrition positively. However, there are challenges for such an outcome to be realized. Intra-household factors may stand in the way in cases where individual household members possess different income elasticities overall, or even within food stuffs.

Furthermore, even when additional income is spent on food, intra-household food consumption could be heterogeneously distributed among family members, with children and women often being relatively penalized compared to adult males (Carletto et al., 2017). In addition, a high marginal propensity to spend on food does not automatically imply a high marginal propensity to consume nutrient-rich diets. Households often choose to go for “variety” by purchasing “fancy” higher cost diets rather than simply using the acquired income to increase nutrient intake (Von Braun and Kennedy, 1994). Also, in the context of Uganda and Africa generally, the effects of commercialization on nutrition are rooted in the socioeconomic and cultural settings of the population. Sociocultural constraints in many developing countries place limitations on what kinds of food is consumed with little or no regard to its nutritional value.

Two important policy implications emerge from this study. First, as agricultural commercialization is beneficial to nutrient intake via income generation, nutrition-sensitive commercial agriculture is critical. This points to the need to proactively provide incentives that engender commercial agricultural production that addresses the nutritional needs of the population so that nutrient-rich food is easily available on the market. This is key because AGRA (2016) indicates that such efforts have often been met with the challenge that farmers in Africa are left with little or no incentive to produce nutrient-rich food. It notes that in some rural communities, while indigenous foods with high nutritional value still exist, they are produced by fewer farmers and their cost is often so high that poor households are not always able to afford them. Second, as rural-based households are less commercialized, on average, they need support to benefit from market-oriented agricultural production. The current government policy on credit and agricultural input provision through the programme code-named “Operation Wealth Creation” is one such intervention that can help improve rural household market participation.

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