

CHAPTER I : INTRODUCTION TO CONCEPTUAL ISSUES RELATED TO AGRICULTURE, FOOD SECURITY, AND NUTRITION

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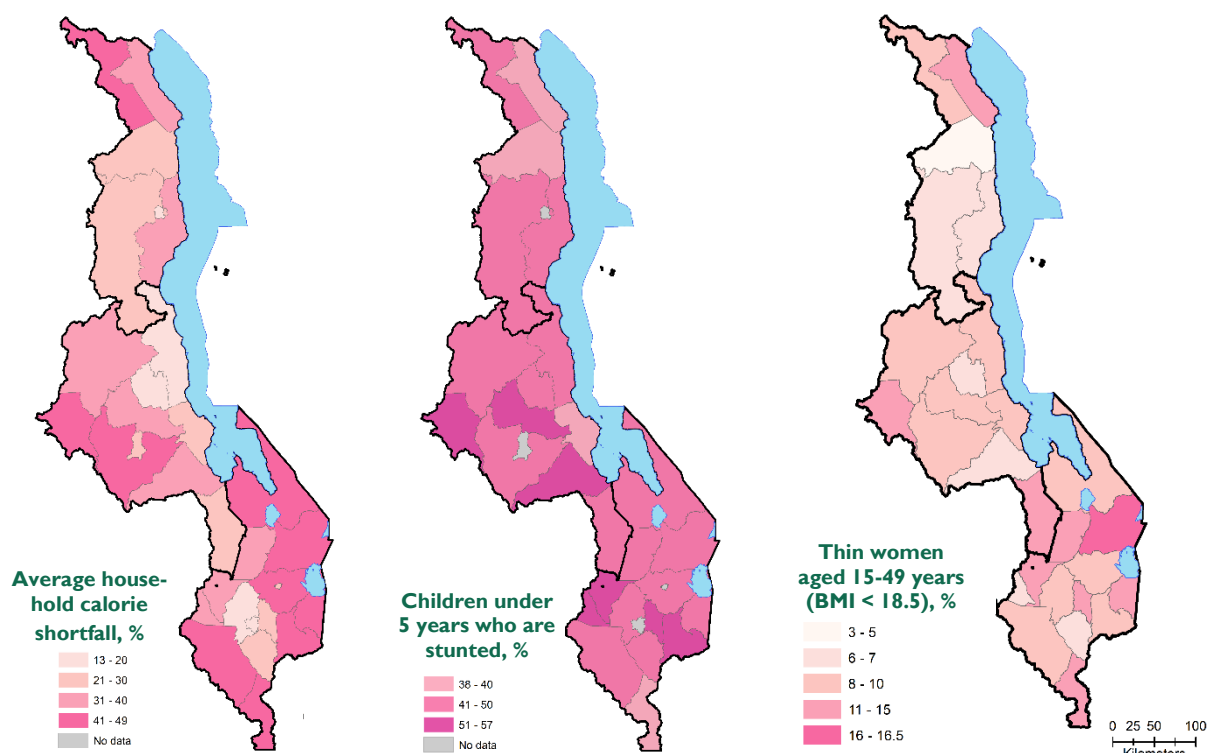
Smallholder agriculture is the mainstay of Malawi's economy. Its importance for livelihoods cannot be overstated. 94 percent of rural residents and 38 percent of urban residents engage in agriculture to some extent (Jones, Shrinivas, and Bezner-Kerr 2014), the vast majority as smallholder farmers with landholdings of less than one hectare. Smallholder crops are primarily maize—which accounted for nearly 80 percent of smallholder-cultivated land in 2011—followed by cassava and other food crops (FAO 2008; IFAD 2011). These foods are grown for household consumption and for sale at local and regional markets. As such, the Malawian food supply, especially in rural areas where markets are thin with few buying or selling options, is shaped largely by trends in smallholder food-crop production.

In the last decade, Malawi has experienced rapid smallholder-led growth in the agricultural sector, largely attributed to the Farm Input Subsidy Program (FISP)—a major sector program providing about half of all smallholder farming households with heavily subsidized fertilizer and seed (Beck, Mussa, and Pauw 2014). In spite of this progress, the country has seen little improvement in nutrition outcomes (Figure 1.1). Almost half of all children under five years of age in Malawi suffer from undernutrition.¹ Although some of these children may be getting enough to eat in terms of total calories, few are consuming sufficient quantities of nutrient-rich foods—meat, fish, eggs, dairy, legumes, fruits and vegetables—on a regular basis. Good nutrition requires both—that is, enough total calories (quantity) and enough total vitamins and minerals per calorie (quality). Without a high-quality diet, even children who are able to fill their bellies on most days will suffer from chronic undernutrition. The most obvious sign of chronic undernutrition is stunted growth, or low height-for-age, where children are significantly shorter than well-fed and healthy children of the same age (WHO and UNICEF 2009).

In addition to suboptimal physical growth, the invisible, insidious effects of chronic undernutrition are of concern. Children under the age of two who consistently consume poor-quality diets are known to have impaired cognitive development that can lead to economic underperformance and other adverse outcomes in adulthood (Hoddinott et al. 2008). Poor school attainment, low per capita income, low wage rates, and likelihood of falling below a designated poverty line in adulthood are some of the indicators associated with chronic undernutrition in childhood (Martorell et al. 2010). And while it is individuals and families who bear the heaviest burden in terms of lives lost and potential wasted, the ripple effects of undernutrition trickle up all the way to national and regional economies. Stunting is associated with GNP losses of up to 11 percent across Africa and Asia, where prevalence is highest (Haddad 2013). In Malawi, where stunting prevalence is very high according to global standards (NSO and ICF Macro 2011), child undernutrition is a huge drain on human and physical capital, constraining national economic growth.

¹ 47 percent of children under the age of 5 are stunted (height-for-age index less than 2 standard deviations below the mean of an international reference population) according to the 2010 Demographic and Health Survey; 30 percent are stunted according to IFPRI calculations based on the 2010–11 Integrated Household Survey (Verduzco-Gallo, Ecker, and Pauw 2014).

Figure 1.1—Average household calorie intake shortfalls, prevalence of stunted children under five years of age, and prevalence of thin women aged 15 to 49 years, by district, Malawi 2010



Source: Analysis by M. Kedir, IFPRI, of IHS3 and DHS data and IHS3 calorie intake deficiency analysis results (Verduzco-Gallo, Ecker, and Pauw 2014).

Given these implications, reducing stunting rates in young children in order to improve human capital for future health and productivity is good policy. Nutrition interventions typically target young children and women of childbearing age, primarily during the key window of opportunity between pre-pregnancy and two years of age. Examples of conventional health-based interventions to improve nutrition are deworming, micronutrient supplementation, improved antenatal care, and therapeutic treatment of acute malnutrition; but, other sectors also have a role to play in reducing undernutrition. Given this paradigm, what role do smallholder-production practices and the food supply chains they influence play in affecting Malawi’s nutrition statistics? And more broadly, what options exist for agriculture-based strategies to improve these statistics? Considering the concept of food security—which along with health and care is considered a key driver of nutrition outcomes²—provides a starting point to answering these questions.

1.1—Food Security: Where Does Nutrition Fit?

Food security is commonly defined as “when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life” (FAO 1996). Nutrition is, therefore, inherent in the definition; but, it is often a component that is minimized. This definition includes four dimensions that must be fulfilled simultaneously:

- Physical food *availability* at a national or community level determined by food production, stock levels, and net trade.

²The conceptual determinants of undernutrition are food (security and quality), health (services and environment), and care (of young children, including feeding) (UNICEF 1990).

- Households' and individuals' economic and physical access to food (for example, the affordability of food).
- Food *utilization*, commonly understood as energy and nutrient intake by individuals as a result of care and feeding practices, food preparation, diversity of the diet, and intra-household distribution of food. Food utilization can be considered the most explicitly nutrition-oriented aspect of food security. It is directly related to our above discussion of the quantity and quality of foods. It is important to note that utilization of food is a biological process that is affected not only by food intake, but also by the presence of infection or disease, since a sick individual will absorb or utilize the nutrients in food less well than someone who is healthy.
- *Stability* of the other three dimensions over time.

In general, Malawian diets are heavily dominated by staple foods, maize first and foremost, but also rice and cassava in some areas. As such, food security in Malawi is often equated with maize production, or the ability of households to acquire enough calories from their chosen staple foods. What is missing by this measure is the importance of the *quality*, in addition to the quantity, of dietary intake. While maize and most other popular staple crops are high in carbohydrates, they are low in proteins, vitamins, and minerals. Because most Malawian meals rely heavily on these staples, other nutrient-rich foods, such as fruit, vegetables, fish, beans, and meat, are often consumed in small amounts or not at all. As a result, meals are often adequate in terms of total calories or *quantity*, but likely to be inadequate in terms of *quality*.

This household-level scenario is reflected in—and exacerbated by—national development priorities; food security is a top-line agenda item for agriculture, whereas nutrition is considered to be a health issue. This conceptual division facilitates conflation of food security with staple crop production, as opposed to encouraging a comprehensive perspective that systematically considers the importance of non-cereal crops and brings in the concept of utilization. It also encourages exclusively addressing nutrition needs through health-based delivery platforms, where the primary focus is on women's and children's health as described above, as opposed to seeing nutrition as a multisectoral issue for which diverse food is a key component and agriculture and food systems are an important driver.

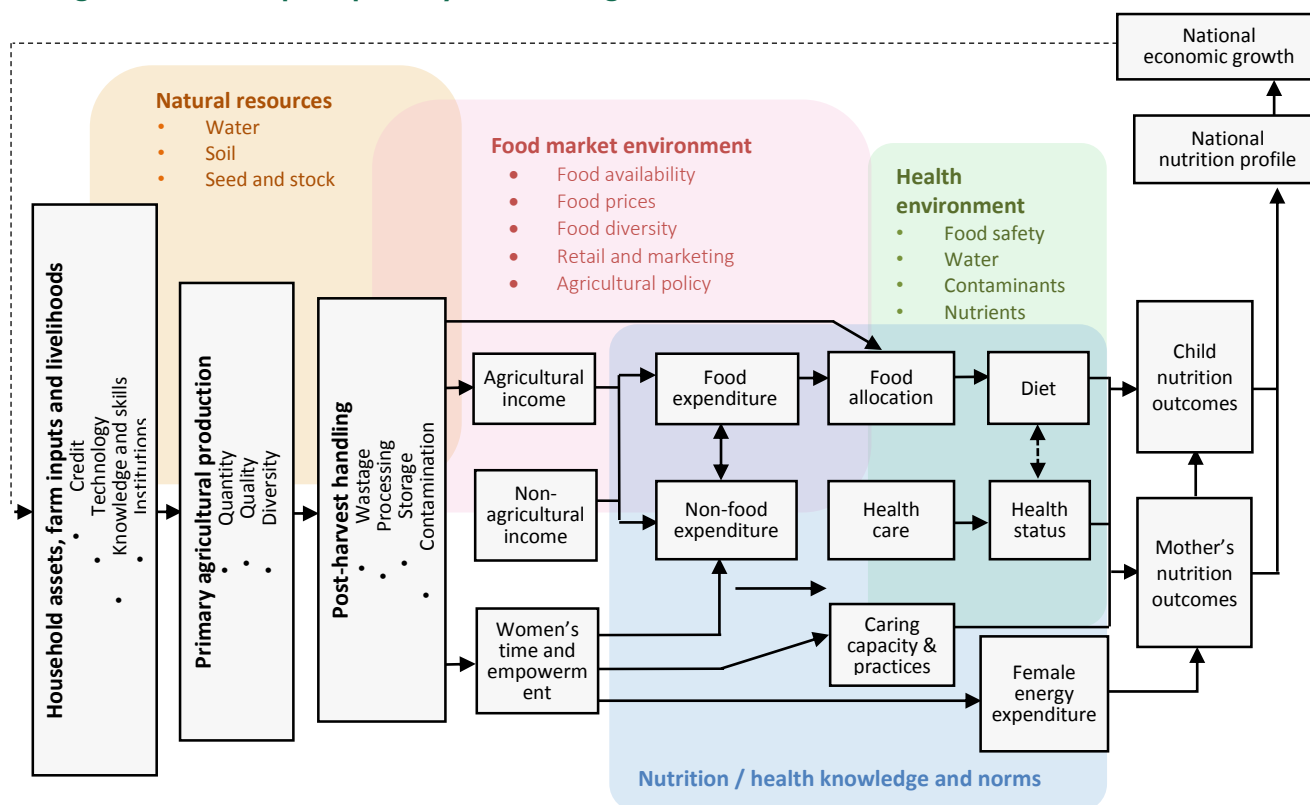
1.2—Conceptual Pathways from Agriculture to Nutrition

Applying a food and agriculture lens to nutrition requires a conceptual framework that clarifies hypothesized causal pathways from agriculture to nutrition. The framework in Figure 1.2—adapted to the Malawi context and referenced throughout this publication—does just this. Agricultural investments and activities are listed on the left of the diagram, while nutrition outcomes are listed on the right. While the trajectories from agriculture to nutrition are not always linear, in general, they can be divided into four main pathways, all of which apply to household and individual level outcomes.

1) Agriculture as a source of food: Agriculture effects nutrition most directly when food grown by the household is consumed within that household. Farm households can improve nutrition of household members if:

- their production practices and post-harvest practices improve the diversity, consistency (over the year) and quantity of foods available to the household;
- the foods available to the household are allocated to individual household members, based on age and gender-specific nutrient requirements; and
- the health status of household members does not hinder absorption of nutrients from healthy foods eaten.

Figure 1.2—Conceptual pathways between agriculture and nutrition



Source: Herforth and Harris (2014)

2) Agriculture as a source of income: Income from wages earned through agricultural labor or the sale of agricultural products can be used to purchase food and other nutrition-relevant items, such as healthcare. Agricultural income can improve nutrition of household members if:

- household income produced from agricultural activity is partly spent on diverse and nutritious foods;
- diverse and nutritious foods are available and affordable in local markets, throughout the year, for purchase by households;
- the foods available to the household are allocated to individual household members, based on age and gender-specific nutrient requirements; and
- the health status of household members does not hinder absorption of nutrients from healthy foods eaten.

3) Agriculture as moderator of women's time use and decisionmaking power: Women regularly work in agriculture and they make the majority of nutrition-related decisions for the family, and young children in particular. When women control income they are more frequently used on food and healthcare for family members (Smith et al. 2003). However, women often do not have control over household resources or power in household decisionmaking. Thus, agricultural activities that increase women's income and decisionmaking power can have positive impacts on nutrition due to increased household expenditures on nutrition-relevant goods and services, assuming that there is a positive net effect on:

- the amount of time a woman is occupied in agricultural activities, with consequences for the time she can focus on the food, health, and care of her family; and
- the amount of energy a woman expends, with consequences for her own nutrition and health outcomes, as well as those of her children (and for fetal health if she is pregnant).

4) Agriculture as a moderator of food markets: Agriculture and food-system policies affect a range of supply and demand factors that influence how well food markets perform in terms of the availability,

price, and diversity of food. Food markets are a part of the environment in which farm households fulfill their food security and nutrition needs. Food-market performance can affect nutrition through:

- the income of net seller households and the purchasing power of net buyers; and
- the availability and affordability of diverse and nutritious foods in local markets, throughout the year.

Agriculture as a moderator of food markets is of particular importance in the Malawian context given the contribution of smallholder agriculture to domestic food supply. Only 5 percent of Malawi's farmers are exclusively commercial producers, while the remainder are largely subsistence-oriented, both buying and selling food to supplement food stocks and to address cash needs (Jayne, Zulu, and Nijhoff 2006). This pathway is captured in the pink shaded box in Figure 1.2 on food market environment. This environment affects the kinds of foods that are available locally and likely to be purchased, as well as those that are likely to be produced by farm households as a response to price signals and market incentives. Farm households determine what crops they will sell to markets and what crops will be consumed at home largely as a response to the food market environment.

Food market environments also are influenced by government policy and the actions of the private sector. In Malawi, input subsidies for maize and private-sector investment in groundnut-based value chains are prime examples. In regards to value chains, it is important to note that labelling and social marketing are tools used by both the public and the private sector to influence food-purchase decisions and consumption habits. These tools send messages about foods' convenience of purchase and preparation, nutritional content, and related perceptions of quality and safety. Depending on the context, these messages can affect purchase decisions by households as much as the relative price of foods.

In addition to food markets, natural resources (in the orange box in Figure 1.2), the health environment (green box), and nutrition and health knowledge and norms (blue box) are often referred to collectively as the "enabling environment for nutrition" (see Box 1.1). Together, these contextual factors affect the trajectories of the causal pathways from agriculture to nutrition described above.

1.3—Conclusion

Agriculture has the potential to affect nutrition through all of these pathways and often through multiple pathways at once. For each pathway, increased access to and availability of nutrient-rich foods is a key step. However, achieving such increases in Malawi requires addressing major challenges in a number of areas, not least of which are strong cultural preferences for meals based heavily on maize and other starches, and the high cost of nutrient-rich foods relative to staples. National agricultural policy can contribute to overcoming these challenges by (1) promoting production of nutrient-dense foods via subsidies and other incentives; (2) promoting food processing, marketing, and consumption in ways that conserve nutrients, create demand, and decrease prices; and (3) supporting women farmers, for example, through targeted efforts to increase their productivity and bargaining power.

This publication provides a series of primary and secondary data analyses that are illustrative of these challenges and their potential mitigation. Chapter 2 begins by providing a primer on indicators that are commonly used in agriculture-nutrition analysis; this chapter also provides an overview of relevant data sources in Malawi and a discussion of current impediments to analyzing agriculture-nutrition pathways. Chapter 3 uses data from Malawi's Integrated Household Surveys (IHS) to look at how changes in particular food consumption patterns are related to changes in the prices of those foods, including how these changes affect a household's access to micronutrients. Chapter 4 presents findings from a qualitative survey that explores the implications of the production and sale of nutritious commodities for improving diets. Chapter 5 uses IHS data to examine the determinants of smallholder-production diversity and its impact on household dietary diversity, again with a focus on household access to micronutrients. Finally, Chapter 6 examines the associations between irrigation and food security and nutrition outcomes, also using IHS data.

Box 1.1—Enabling environment for nutrition: Natural resources, health, knowledge, and norms

Natural resources environment:

Appropriate management of natural resources—water, land, and biodiversity—has direct consequences for the livelihoods and nutrition of farm families. Irrigation, for example, facilitates production diversity and increased yields with positive implications for food consumption and nutrition; however, it can also increase the risk of ill health due to water borne disease and fertilizer run-off.



Malawian child drinking clean water from a well

Climate change should be a routine consideration in management

strategies. Early or late onset of rains, floods, droughts, shortened crop seasons, and premature harvests cause yield declines, which leads to decreased food availability and income for farming households. These challenges require farmers to continually adapt their agricultural livelihood strategies to maintain the viability of their natural resources base.

Health environment: Agricultural production interacts with health environments and related water and sanitation environments to influence nutrition for better or for worse. For example, livestock production schemes may increase exposure to zoonotic disease and impair good sanitation practices. Another example is employment schemes in rural areas which target women. While these programs may increase income, they may also reduce the amount of time women spend on child care, cooking, fetching water and firewood, and home-based agricultural work, all of which are directly related to nutrition and health. Agriculture projects will have a higher likelihood of successfully impacting nutrition when these inherent tradeoffs are acknowledged as important considerations to be routinely addressed via risk reduction measures.

Knowledge and norms: Farming and nutrition knowledge held by family and community members has a major bearing on decisions related to agriculture and nutrition that are made within households. For example, activities that promote knowledge of nutrition and health may affect decisions around food production, purchase, and consumption. The decisions may enhance positive outcomes for both the agriculture and nutrition sectors while avoiding negative impacts. Conversely, knowledge and use of key agricultural practices and skills can include information that builds awareness and protects against harm to health and nutrition. For example, nutrition-sensitive livestock-raising practices may change how animals are kept in relation or proximity to the home, or nutrition-sensitive irrigation practices may help avoid household consumption of contaminated water. Social and behavioral change activities promoting nutritious diets and healthy practices—provided by an agricultural extension system or in collaboration with other sectors—can further enhance the impact of agricultural activities on nutrition.

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