Chapter 3 UNDERSTANDING HOUSEHOLD PREFERENCES ON THE PRODUCTION, CONSUMPTION, AND SALE OF NUTRITIOUS CROPS

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ABSTRACT: VALUE CHAINS AND AGRICULTURAL COMMERCIALIZATION ARE INCREASINGLY promoted as mechanisms for agricultural transformation, inclusive growth, and, more recently, improved food security and diets. In particular, donors and implementers of nutrition and food security programs are promoting the production of nutritious crops as a mechanism for improving the quality of and diversity in the diets of the rural poor. However, while a theoretical basis exists for suggesting that production of these crops may improve diets, there is limited empirical understanding of how agricultural production impacts diets (impact pathways) and under what circumstances production of nutritious foods can lead to improved diets. This chapter examines pathways from production to diets by analyzing qualitative data collected from three districts in three regions of Malawi. The analysis specifically explores contemporary food preferences, patterns, and decisions related to crop sales, and gendered household decision-making dynamics. The results indicate that households desire diverse diets, but access to (affordability) and availability of diverse foods are limiting factors, as is a dominant maize-first approach to assuring household food security. In addition, many nutritious crops that households produce are both consumed and sold. Decisions about what or how much to sell are based on consideration of a range of factors. Nutrition training—promoting consumer demand for key commodities—combined with value chain approaches to decrease price and increase availability might successfully improve diets in this context.

Value chain development and agricultural commercialization are promoted as mechanisms to support agricultural transformation and inclusive growth. More recently, the potential for leveraging value chains to improve food security and diets is being explored. Views of commercialization in agricultural development discourse fluctuated over the years. Initially framed in terms of moving subsistence farmers into cash cropping and specialization, and subsequently criticized for exposing the poor to the high risk of engaging in commodity markets, the discourse shifted over a decade ago to include commercialization in terms of its effects on nutrition (Alderman 1987; Kennedy and Cogill 1987; DeWalt 1993; Peters and Herrera 1994; von Braun 1995). Theoretically, market-oriented production should allow farmers to increase their incomes and purchase more nutritious foods. However, there is very little empirical understanding of the pathways through which such production impacts diets and under what circumstances. What is clear is that a variety of constraints posed by commercial farming can impede positive dietary changes. These include the tendency of men to control income from cash crops, the inherent price instability of cash crops, and the tendency to spend lumpy income (payments that happen infrequently and irregularly) on nonfood items (DeWalt 1993).

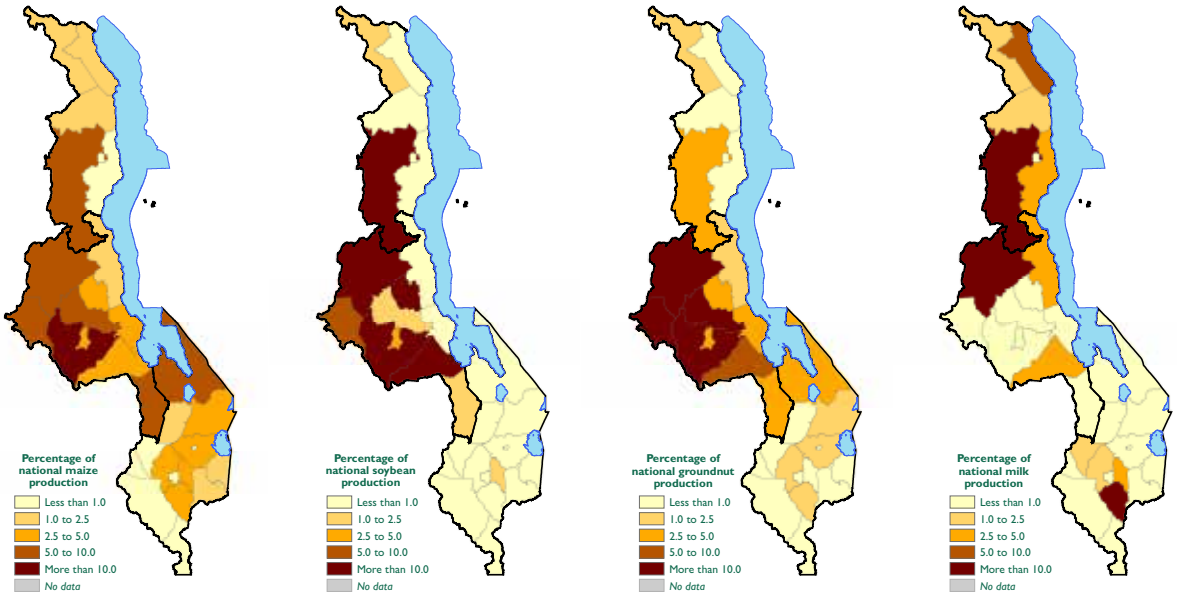
Because Malawi's current development agenda increasingly focuses on measures to transform and commercialize a largely subsistence-based agricul-

ture sector, the implications of commercialization for diets and nutrition are highly relevant for Malawi, especially when the country's high rates of child stunting are considered. Maintenance of subsistence farming practices alongside cash crops can be viewed as a mechanism to minimize the inherent risks associated with volatile market prices (Gillespie, Harris, and Kadiyala 2012). Furthermore, crops that are both nutritious and commercially viable can overcome the inherent risks associated with engaging in markets because they can be consumed if market prices are not profitable. This type of approach can be described as harnessing value chains for nutrition (VCN) (Gelli et al. 2015). Distinct from typical value chain assessments that emphasize economic factors, the VCN approach applies a nutrition lens through increasing demand for and/or supply of nutritious foods, and through nutrition-focused value addition to agricultural commodities (Gelli et al. 2015; Hawkes and Ruel 2011).

For instance, groundnut and soybean are both nutritious foods that, in Malawi, are (1) eaten raw or as a minimally processed food by households, (2) sold for medium- or large-scale domestic processing into higher-value products for human or animal consumption, (3) processed on a small scale at the village level for human consumption, or (4) exported raw regionally or internationally. As such, groundnut and soybean in Malawi are high-potential commodities for VCN, as they have the potential to enhance livelihoods, reduce risk, support private-sector and market development, and improve dietary quality. (See Figure 4 for maps on district-level production of several commodities discussed in this chapter.)

However, the effectiveness of the VCN approach for improving diets is mediated by social norms about preferred foods and intrahousehold allocation of food, control over decision making for farm activities and use of income, and knowledge about nutrition and willingness to pay for nutritious foods

FIGURE 4 DISTRICT-LEVEL PRODUCTION OF MAIZE, SOYBEAN, GROUNDNUT, AND MILK IN MALAWI, BY PERCENTAGE OF NATIONAL PRODUCTION SHARE, 2010



Source: Analysis by M. Kedir Jemal, IFPRI, of IHS3 data.

Note: Annual national production-level estimates based on weighted analysis of household production data reported by IHS3 respondents are maize: 1,684,000 metric tons (mt); groundnut: 235,000 mt; soybean: 30,000 mt; and milk: 31,000 mt.

(Gelli et al. 2015). All of these are closely linked to gender relations in the household. As such, this chapter examines contemporary food preferences, patterns, and decisions related to crop sales and gendered household decision-making dynamics, all of which have implications for strengthening value chains for nutrition.

Specifically, we assess the social drivers (or limiters) that mediate farm households' ability to produce these foods to improve diets in rural Malawi. We emphasize gendered household preferences and decision-making dynamics related to the production, consumption, and sale of nutritious commodities. The findings are based on information obtained through a series of individual interviews with women and men from a sample of households in Balaka, Karonga, and Ntchisi districts.

PLAUSIBLE IMPACT PATHWAYS

Adding a nutrition lens to discussions on expanding the commercialization of agricultural production provides several potential benefits. The most direct impact pathway to improved diets is through production of these foods, leading to increased own consumption of nutritious commodities. That is, increased production ostensibly for commercial purposes could increase the quantity and diversity of food consumed by individuals within producing households. The second pathway is through the sale of crops. Increased income from commercial sales can be used to purchase higher-quality, nutrient-dense foods for household consumption, if the foods are available in the market and acceptable to or preferred by family members. Third, the increased production of nutritious foods can increase their availability in markets, making it easier and more affordable for people to access them.

The final pathway is through impacts of commercialization of agricultural production on women's time and decision-making power. Commercialization may increase household income, but women's influence over decisions about how to spend that income or how much of the nutritious commodities produced by the household they will keep mediate the extent to which any improvements to diets will be achieved. In addition, the impact of commercial activities on the time commitments women face can either free up or further constrain time for the feeding and care of nutritionally vulnerable household members. Central to the impact this pathway has on nutritional outcomes are the prevailing social and cultural norms at play that determine the role of women—traditionally the primary caretakers in the household—in commercialization.

The empirical evidence is not conclusive in terms of the relative effectiveness of these pathways, globally or in Malawi. Impacts on nutrition of interventions to increase production of cash crops will not occur through the own-consumption pathway, but could potentially impact diets through increased income or through women's empowerment if women are targeted or otherwise impacted. However, increasing production of nutritious crops can impact diets through own-consumption or income pathways if the crops are also marketable. Nutritious crop production can also impact women's time and empowerment, depending on the gendered characteristics of the crops, such as the extent to which women or men are responsible for production, who can sell and keep proceeds related to the product, and how other activities and responsibilities are positively or negatively affected. Furthermore, the impact pathways here assume that the production of most food in Malawi continues to be dominated by small-scale producers. If the principal source of food shifts to large-scale industrialized producers, then the rural poor would be more dependent on wage labor to gain access to sufficient food for their needs and their degree of access would be more affected by changes in global food prices than is currently the case (Carolan 2016).

Investigating the income pathway, an evaluation conducted in Kenya in 1987 found that households participating in a sugarcane outgrowers scheme had greater calorie consumption but no improvement in child nutrition outcomes compared with nonparticipating households (Kennedy and Cogill 1987). A study in Malawi showed that while cash-cropping families had

higher incomes, the lumpiness and seasonality of their incomes reduced the positive effects this income otherwise might have had on household food intake (Masangala 2005). Moreover, while a 1994 study of tobacco producers found that income source had no effect on stunting in children (Peters and Herrera 1994), a more recent study found that when faced with an income shock, children in tobacco-producing families fared worse in terms of stunting (Wood and Nelson 2013).

Recent studies examining crop diversification in Malawi show that as the incomes of farming families rise and they engage in markets, they tend to increase household calorie consumption and household dietary diversity (Jones, Shrinivas, and Bezner-Kerr 2014; Snapp and Fisher 2014). Similarly, a study on the commercialization of cassava in southeastern Africa documents the food security benefits of cassava production, whereby cassava was seen as both insurance against a failed maize crop and a marketable commodity (Haggblade et al. 2012). This may point to the effectiveness of crop diversification in improving food security through overcoming the barriers associated with the lumpiness of income from a single crop noted above, although these studies did not examine effects on individual diets or nutrition outcomes. Furthermore, these studies did not specify whether the increase in household calories was due to own-consumption or income pathways, or if there was any impact on the quality of foods consumed.

When farm households produce nutritious commodities, they may be sold in the market or consumed. This may impact dietary quality—in addition to having a potential effect on calories consumed—through own-consumption or income pathways. An early study of dairy cooperatives in India found that the nutrient consumption of commercialized farmers increases not through own consumption (as they do not consume more milk), but rather through purchasing other nutritious foods in the market (Alderman 1987). Value chain studies on groundnut, soybean, and pigeonpea in Malawi show a complex household decision-making process over consumption and sale of some of the harvest. Pigeonpea is largely consumed by the producing household, though some is sold domestically and internationally (Makoka 2009). However, soybean and groundnut fluctuate between being cash crops and own-consumption crops, depending on the local context, such as the gender dynamics, profitability, and need for inputs (Cook et al. 2014).

Several studies examine the effects of women's time and decision-making power on nutrition outcomes. Women's education and status relative to men's was found to be strongly associated with child malnutrition globally (Smith and Haddad 2000). Cunningham et al. (2015) find that women's empowerment (measured with the Women's Empowerment in Agriculture Index) is significantly associated with improved child nutrition status. Finally, a recent review of studies on women's time use and nutrition indicates that women are indeed time constrained due to their significant role in agricultural production, and that agriculture interventions tend to further constrain time (Johnston et al. 2015). Impacts of agricultural practices on nutrition are not clear-cut, but are mediated by several household characteristics, such as socioeconomic status, ability to purchase food, and the presence of household members who can take up additional work when needed.

METHODS

This inductive analytical study seeks to contribute to a clearer understanding of how the production of nutrient-dense, commercially marketable foods affects diets in rural Malawi. In particular, we are interested in better recognizing the social drivers (or limiters) of the possible impact pathways already defined in the conceptual literature. Because women's time use and decision-making power mediate all the possible impact pathways from production of nutritious commodities to improved diets, we primarily examine the gendered household preferences and decision-making dynamics related to production, consumption, and sale of these commodities. We examine

- social norms and perceptions about preferred foods and eating patterns;
- rationales and trade-offs related to the decision to sell or consume certain different crops;

- social norms about gender relations, because they affect control over farm decision making and the use of income from sold commodities; and
- knowledge of nutrition, because it can influence demand for nutritious foods and feeding practices.

While we highlight three commodities of interest for their nutritious and marketable qualities, during interviews we allowed respondents to define what they considered to be nutritious commercial crops. Generally, when asked what commercial crops they produce, respondents included all crops that can be sold in the market. The commodities we focused on were soybean, groundnut, and cow milk.

Soybean, while not widely considered a locally preferred food, is highly nutritious in terms of protein, fiber, and micronutrients; is in high demand by domestic processors and the regional export market; and can have positive impacts on soil quality through biological nitrogen fixation. Industrial uses of soybean in Malawi include large-scale oil pressing and processing the resultant cake into chicken feed or for export. Typical food uses include processing into flour for porridge or into soy pieces, a meat substitute. Ntchisi in the Central Region was targeted for our study as a high soybean production district.

Second, groundnut is in high demand as a locally marketed and consumed food. It is typically consumed after processing into a powder and mixed with vegetables. In addition, there is local processing of peanut butter, other snack products, and ready-to-use therapeutic foods (RUTF) for moderately and severely wasted children. There is also high demand regionally and from high-value markets, such as Europe and South Africa. Access of Malawian producers to these markets is currently impeded by the high aflatoxin levels of domestic groundnut. In fact, the nutritional benefits of consuming groundnut must be weighed against the negative effects of high aflatoxin levels. Balaka in Southern Region was targeted as a high groundnut production district.

Finally, production and consumption of milk is extremely low in Malawi, as is cattle ownership. While per capita production increased moderately over the last decade, it is still among the lowest in the world, at 4.3 kg annually in 2011 (FAO 2015). However, milk could provide critical nutrients that are missing from a staple-heavy Malawian diet. While lack of adequate cold chains currently makes extensive commercialization and export of milk products challenging, initiatives to promote local storage and marketing of milk could have significant impacts on dietary quality. Because Malawi's Northern Region has a relatively higher level of cattle ownership, Karonga was targeted as a milk-producing district.

We took a purposive sampling approach, starting with targeting districts that are producing the products of interest for the study and that have high levels of stunting. Then we relied on government agricultural extension staff in the target districts to guide us on the choice of an appropriate study village based on two criteria: (1) that many village members produce one or more of the crops of interest and (2) that they are located within 5 km of a major daily market. The second criterion allows us to take the focus off market-access constraints—which are usually greater for women than for men, but are not the focus of this study—and allow us to discuss in-depth other factors related to the decision to market products. Three communities were targeted using these criteria, and between 12 and 15 households within each community were sampled for in-depth individual interviews, with a total of 80 individuals interviewed (39 men and 41 women).

Interviews were digitally recorded, transcribed, and translated from the Chichewa and Chitumbuka languages to English. Transcriptions were thematically coded using NVivo software. An initial coding pass was used to determine the main concepts arising from the interviews, which were used to augment and enrich an a priori, deductive coding schema. Interviews were then systematically coded against this list. A range of code- and text-based search protocols, including both Boolean and proximity searches, was then applied to extract findings on each topic of interest.

FINDINGS

PREFERRED FOODS AND EATING PATTERNS

Although the study districts were purposively selected to capture production of soybean (Ntchisi), groundnut (Balaka), and milk (Karonga), accounts of foods consumed at home were quite similar. Except for dairy products, which were most intensively consumed in Karonga, aggregate dietary patterns in the study households exhibited little variation by either district or household.

Nsima (maize meal polenta) is the starch par excellence in these areas. Breakfasts are often porridges made from maize or other starches, cakes or sweet fritters, and occasionally tea, with or without milk and sugar. Meals taken at midday and in the evening are *nsima* accompanied by "relish." Relish is any food item that accompanies *nsima* and almost always includes pumpkin leaves, green vegetables such as okra, brassicas such as rape, mustard greens, and cabbage, and tomatoes and onions if available. In Karonga only, *chambiko*, or soured milk, is highly appreciated as a relish to accompany *nsima* or other starchy foods. If cooking oil can be afforded, the relish is cooked with oil. Relish may also include protein foods such as legumes (pigeonpea, cowpea, and other beans), soybean, groundnut (pounded and added to leafy vegetable stews), small dried fish (*matemba* or *bonya*), chicken, eggs, and more rarely, meat (typically goat or occasionally beef; pork and rodents are generally taboo, and bushmeat was not mentioned). Chicken and eggs are popular and widely appreciated; both are kept for food consumption, but may be sold when money is needed. Duck meat is more complicated: several respondents asserted that it produced an allergic skin reaction, while others stated that duck was prohibited under halal dietary laws (in fact, duck is halal if it is slaughtered in accordance with halal rules).

This meal format is ubiquitous to the point of universality. Other starches such as cassava, bread, and rice were mentioned in interviews, but the archetypal meal is based around *nsima* made from maize. This is not unusual; staple starches often occupy a very dominant position in food repertoires internationally; in such cases, the inclusion of a staple may be a defining criterion of what constitutes a meal. Certainly in these districts our household respondents' largely shared concept of a proper meal took the form of *nsima* with relish. As one informant from Balaka explained, "Relish only or *nsima* only does not make a meal. In that case, you do not have food." The preference for *nsima* was explained on the grounds that it is "satisfying," but also by allusion to tradition or upbringing—*nsima* is the main food that everyone has grown up with. Following Bourdieu (1977), it may be considered to be part of the quotidian habitus of the people composing the study population. As one Balaka respondent noted, "The reason why it is ideal is that we grew up used to these foods. We did not grow up used to other foods. I feel good, satisfied, and it tastes good. The meals that we eat in most cases are *nsima* with vegetables like cabbage, pumpkin leaves, and mustard greens." Fruits such as mango, papaya, banana, citrus, apple, and pineapple were also mentioned in interviews, chiefly as purchased items, since people do not tend to cultivate them in their gardens. Market availability of these items is seasonal. In a very small number of Ntchisi households, respondents stated that they made soy milk for home consumption, but this does not appear to be at all common, even in this district chosen based on its relatively high level of

Malawian family substitutes mangos for *nsima* during the hunger season

soybean production. Even in these soy milk–producing households, respondents complained about the lengthy processing required to make soy milk. In one Balaka household, the respondent noted that she would like to consume soy milk, but did not have any.

Maize is a critically important cultivar, and there is a clear prioritization of keeping it for food security rather than selling it—some respondents made the point that it did not make sense to sell one's maize crop, only to have to purchase maize later in the year. That said, maize is sold, and at times purchased, but concern is certainly widespread that enough should be kept to avoid running out later in the season. Many other foodstuffs, however, are bought at local markets when money and produce are simultaneously available. These include protein items such as fish, meat, beans, soybean, and groundnut; vegetables, including greens, brassicas, tomatoes, and onions; and occasionally other starches such as rice, potatoes, and cassava.

Market purchasing is periodically subject to various constraints, the most frequently mentioned of which is financial. When respondents articulated desires to eat "aspirational" foods, such as more meat, rice, chicken, cooking oil, milk (fresh or fermented), sugar, eggs, soy products, or simply more frequent *nsima*- and relish-based meals, the most common constraint was money. Respondents explained their choices of aspirational foods with reference to satisfaction, better nutritional quality, and tastiness. In addition to financial constraints on obtaining desired foodstuffs, respondents flagged distances to markets—although communities were purposively chosen to be within 5 km of a major daily market—and the limited availability of a wider range of foods in the markets.

It is instructive to examine responses to a line of questions about substitution—what do people do when they do not have access to key foodstuffs? It is clear that the choices available are often limited. It is also evident that the absence or shortage that most concerns people is not relish, but *nsima*—when asked about substitutions, informants focused principally on explaining what they did if they did not have *nsima*.

One strategy mentioned by several informants is to substitute porridge for *nsima*. In effect, this means increasing the proportion of water to maize flour, so that a given amount of starch—maize meal or other—feeds more people. Another approach is to increase the amount of gathered fruit in the diet (especially mangoes, which may be boiled). This is considered to be a particularly poor substitute if no starch is available. Interestingly, rice is mentioned as a potential substitute for *nsima*, which seems contradictory given the frequency with which rice is mentioned as an aspirational food—in the latter category, rice is an object of desire, while in the former it is a second choice if *nsima* is unavailable. Cassava is also regarded as a potential substitute for maize-meal *nsima*.

CONSUMPTION AND SALE

Many food cultivars sold in these districts are also used for household consumption, although the converse is not true. These include maize, pigeonpea, and other beans; groundnut; and soybean. Sesame, cultivated in Karonga, is technically a consumable crop, but in practice it is not consumed; instead, it is treated as a nonfood cash crop like cotton. In better-off households, livestock are kept: cattle, pigs, goats, ducks, and chickens. Cows produce milk and work as draft animals at home or rented out for extra income, while also serving as insurance policies in the event of serious income shocks. *Chambiko*, or soured milk, a popular food in Karonga, is generally either bought in the market or made from milk produced by family cows. It is only made from cow milk; goat milk is reserved for drinking. Only 3 of the 15 Karonga households interviewed mentioned selling their *chambiko*; overall in Karonga, *chambiko* is more often consumed than sold. Chickens and eggs are kept for both household consumption and cash sale, although it is less common to slaughter and consume chickens than to sell them. Small livestock are often used as a way of saving cash, though perhaps not large amounts. When a household needs money, a smaller animal may be slaughtered and sold. It might also be used for home consumption.

Households in our study communities give careful thought to balancing consumption and sale; this is important given that the foods grown do dual duty as food and as commodities. This is evident in the explanations around food crop sales provided by the respondent from Ntchisi below. Study participants explained in interviews that they took a range of factors into account when making decisions about what or how much to sell. This is an especially relevant point when considering a VCN approach, because it demonstrates that a population mainly composed of subsistence crop producers is accustomed to evaluating a broad range of factors before selling nutritious food commodities. In terms of programming implications, this means that much of the educational groundwork is already in place—people have a good understanding of how to make decisions based on assessments of competing priorities. In other words, while some priorities might need to be reassessed in light of limited nutrition knowledge, for example, the heavy focus on *nsima*, the analytical apparatus for doing so, in fact, is present. This point is illustrated in the quote below.

> *I had one and a half pails of soybean, but sold one pail because of a problem of school fees for the child . . . I kept half a pail for consumption, and there was no influence from any organization. I just keep some soybean for porridge at home. On the part of maize, I did not sell any of the 22 bags I produced, because it is the main food for the home, but I also expected some money from the soybean that were submitted for sale, so there was no pressure to sell maize. As for beans, I produced 60 kg, and it was all sold in August, but the money is not yet received. I just kept a little bean, about 2.5 kg, for consumption. Otherwise, we are not allowed to keep any of it if it is a contract. I also produced 2 bags of cowpea. It was all sold at MK300 per kg in August. I did not keep any, following the contract terms. Groundnut produced six unshelled bags, and I sold three bags in August. I kept some for consumption by adding to relish, but also for roasting, as it provided nutrition to the body.*
>
> (Male head of household in Ntchisi)

Key issues taken into consideration in decision making about food sale and consumption include:

- **Food security:** This is the first and foremost factor to consider. People are very unwilling to jeopardize their household food security, particularly as it relates to maize. As one Balaka informant explained, "It is always expensive to buy maize, especially knowing that you had it and you sold it. It is only . . . a lack of income that makes us sell our maize." The food security argument is not relevant only to maize—indeed, people are careful to keep some or all of their food crops for consumption. But maize is certainly the commodity that people feel most strongly about. Informants also noted that a household that found itself without maize would need to engage in piecework to earn money to buy maize.
- **Financial needs:** Families require cash for a range of household needs, such as school items, building materials, soap, relish ingredients, medical items, and productive assets, such as tools and fertilizer. Once food security has been taken into account, families consider these needs and make decisions about sales. Note that in cases where families hire labor, another requirement is paying the piece-workers, either in cash obtained from commodity sales or in-kind using maize grain or meal.
- **Quantity:** Related to the discussion of food security above, if harvest quantities are too low, selling is not considered a viable option.
- **Seed banking:** As subsistence horticulturalists, residents of these districts understand the need for making their seed supplies sustainable. In particular, quantities of peas and beans are held

back from both sale and consumption to sow fields again the following season.

- **Pricing:** Particularly in relation to maize, respondents noted that they were strategic about when to sell their production. If prices are too low, maize, which stores well, can be stored until prices rise again. This principle also applies to other commodities. We do not have direct responses on this, but it may be the case that in situations where maize prices are unattractive for sale, people respond to more immediate financial needs by slaughtering and selling livestock.
- **Social Needs:** Feeding needier relatives is culturally important. Households take this into consideration, particularly after ensuring that their own food security is adequate.
- **Insurance:** As noted above, livestock ownership may serve both as a device for saving money and as an insurance policy against severe income shocks.

GENDER AND DECISION MAKING

> *"But the ones I control are like useless crops because they are kitchen crops."*
>
> (woman in Karonga)

Our data show great, though largely unpatterned, variation in responses to questions exploring the relationship between gender and decision making in production and sale of crops as well as on expenditures made with the proceeds of such sales. This variation principally revolves around the question of who makes decisions in the household and is evident both between and within households, as in many cases both husbands and wives within households were interviewed.

Wife, Balaka:

Q: *Are there any decisions that you are supposed to make because you are a woman?*

A: ***Yes, especially on maize and other edible crops. Mostly men are never home, so if you put all the control on a man, he can disappoint you when he has gone out. Sometimes they go away for weeks; it is better that I should have my own input as a woman. A woman is the one who prepares food for the family compared to men.***

Husband, same household, Balaka:

Q: *Who made the decision on selling the crops that you sold?*

A: ***On sales, I was the one who decided to sell maize. I made that decision and told my wife, and she obeyed. I did the same with pigeonpea.***

Despite this variation, it is possible to discern a basic overall pattern of decision making. This pattern evokes the highly critiqued concept of domestic (female) and public (male) spheres and references the quotation at the beginning of this section. Overall, men have more decision-making weight around crops where exchange value dominates use value—that is, with crops that engage more closely with the public sphere of exchange. Women, on the other hand, have more decision-making power around crops whose use-value dimension is stronger, that is, with crops that tend to be conceptualized as occupying the domestic sphere of consumption. While informants tended to reject ideas about "women's crops" and "men's crops," this is, in effect, the operative division. Beans, pigeonpea, vegetables, and cowpea fall into the former category, while nonfood crops, such as sesame and cotton, occupy the "men's crops" end of the spectrum. Soybean, groundnut, and maize occupy a middle ground because of their important dual roles as key items for household consumption and as a market commodity. This is illustrated in Figure 5.

FIGURE 5 GENDER ROLES WITH REGARD TO DECISIONS ON THE CONSUMPTION OR SALE OF KEY CROPS AMONG MALAWIAN FARM HOUSEHOLDS

Source: Authors.

While this model is quite dominant among the study households, it is also important to note that in a significant number of households reference was made to collective decision making and discussion. The key message for any contemplated VCN program would be that, except for nonfood cash crops, most of the crops produced by the study households exhibit some degree of duality in terms of men's and women's decision making. That said, there are certainly cultivars for which decisions on their use tend to be gendered.

NUTRITION KNOWLEDGE

Respondents were asked a series of questions about nutritious diets. Nutrition knowledge was generally quite good in the study sample, although we note that different respondents tended to emphasize different aspects. We also note that informants were not asked about specific infant and young child feeding practices, even though suboptimal young child feeding practices and lack of understanding of their specific, rapidly changing nutrition requirements are a major contributor to child undernutrition. Rather, the focus was simply on their knowledge about nutritious foods and concepts of nutrition in general. Key points raised were the following:

- The importance of dietary diversity—respondents mentioned a wide range of foods, including starches, legumes, meat, fish, chicken, vegetables, dairy, fruits, and fats, and stressed the importance of varying these in the diet and producing mixed and balanced meals.
- The role of good nutrition in resisting disease, building and repairing the body, and providing energy—several respondents associated these qualities with vitamins, proteins, and carbohydrates and fats, respectively.
- The importance of proper food preparation to maximize nutrient access.
- The importance of good handwashing and sanitation practices to avoid illness.

DISCUSSION

Respondents had a relatively good understanding of nutrition; however, it was not seen as a priority issue compared with other criteria underlying their food decisions. Food security, which can be interpreted as having enough maize for the year, was topmost and was largely reflected in concerns about maintaining sufficient supplies of maize for *nsima*. However, food preferences included eating more diverse and often more nutritious foods. This somewhat contradictory set of results can be interpreted as a preference for food security over maize security, but not necessarily as a lack of knowledge or desire for a diverse diet.

Needs for cash are numerous and important, but people avoid selling food crops if they do not feel they can meet their immediate food needs with their stocks. Holding onto food stocks may also serve as a means of hedging, waiting for a better price, or keeping a store of assets in case of an income shock or unexpected major expense.

While financial obstacles were the most commonly mentioned barriers to purchasing preferred or nutritious foods in the market, lack of availability was also a major barrier. As such, it is possible that specific VCN approaches could effectively combine nutrition training—promoting consumer demand for key commodities—with value chain approaches to decrease price and increase availability. Many nutritious crops that households produce are both consumed and sold. Decisions about what or how much to sell are based on consideration of a range of factors.

Regarding specific commodities, soybean, groundnut, and maize are both sold and consumed. Thus they have potential for responding to VCN approaches to improve their impact on nutrition through increased productivity, nutrition training to increase consumption, or linking producing households to nutrition-enhancing supply chains. Because fruit tends not to be produced at home but purchased in the market, there may be an opportunity to promote more household fruit production as well as improved linkages to nutrition-enhancing supply chains for farm households producing fruit.

A common deficiency in Malawian diets is the lack of animal-source foods, including meat, poultry, and dairy (Government of Malawi 2009). Unfortunately, livestock and poultry are more often viewed as banks of wealth rather than as a food source. Fresh milk and, more important, homemade *chambiko,* which has a longer shelf life and is used as relish, may be exceptions, particularly in Karonga. Milk and *chambiko* consumption are very low in the other two study districts and, as discussed above, do not make up a central part of typical diets there. However, it is possible that a combination of nutrition training and promotion of supply-chain linkages for milk and dairy products to decrease prices may increase demand marginally. In fact, there is evidence that *chambiko* consumption increases when its price goes down, whereas fresh milk consumption increases only in response to an income increase (Akaichi and Revoredo-Giha 2012).

Past research documented shifts in gendered control over crops like groundnut and soybean when commodity commercialization programs moved such crops from largely being under the control of women to being under the control of men (Cook et al. 2014; Quisumbing et al. 2014). Our research shows that household decision-making dynamics between women and men are more diverse and complex than that. Respondents tended to reject the idea of men's and women's crops; however, overall they tend to conform to stereotypical gendered roles in terms of men having more power in decisions over crops with high exchange value rather than those produced primarily for consumption. Soybean, groundnut, and maize fit into a unique category, as they play an important dual role for household consumption and as commodities and thus a dual role in terms of gendered control. These crops are also more likely to be the focus of intrahousehold, cross-gender discussion and debate over whether they should be sold or consumed.