

Local and Regional Procurement of Food Aid in Uganda:
The Experience of Maize Traders

Joanna Upton^{*†} and Elaine Hill[†]

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Abstract Local and regional procurement (LRP) of foods in developing countries is becoming an increasingly significant modality of food assistance. It is of particular importance for Uganda, which has been the primary regional source for food assistance in Eastern Africa for over a decade. Many claims are made about the potential benefits, as well as risks, of LRP for food producers and consumers in developing countries. The evidence supporting or refuting these claims is however still thin. This paper employs evidence from 119 extensive surveys with maize traders in Uganda to elucidate the nature of the key claims made about the impacts of LRP, and in particular their validity in the case of Uganda. This evidence also reveals the possibility for impacts that have yet to have been discussed, and highlights new and interesting questions for policy makers and researchers.

Keywords Food insecurity · Food assistance · Local and regional procurement · Maize markets · Market analysis · Uganda

[†]Cornell University, The Dyson School of Applied Economics and Management

^{*}Contact author: jbu3@cornell.edu

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Introduction

Local and regional procurement (LRP), the purchase of foods for food assistance in or near an affected region, is growing in importance in the world of food assistance. Food aid has been traditionally “tied,” which is to say contingent on sourcing in donor countries. The political climate in agricultural policy and food assistance has been changing over the past decade, however, and donors are increasingly compelled by the cost and other advantages of LRP.

Regional sourcing in developing countries near to affected countries is increasingly common. Uganda, as a hearty producer of grains located in a broader region affected by food insecurity and conflict, has become a key source for regional procurement. The World Food Program (WFP) began procuring food, mainly maize and beans, in Uganda in 2000. Over the past five years procurement volumes averaged over 100,000 metric tons annually, and are set to more than double in 2011.¹

Some of the primary compelling arguments for LRP are its potential for savings in cost and speed efficiency in meeting sudden food needs. However, many other claims are made regarding its potential benefits—as well as risks. Proponents claim in particular that injecting this money into developing country agriculture can result in benefits for poor producers and stimulation of developing country markets. Critics focus on impacts on agricultural commodity prices such as aggravation of price hikes and instability that could adversely impact poor consumers.

This paper contributes to this discussion, with a focus on maize markets in Uganda. Employing data from 119 extensive surveys with maize traders undertaken during the summer of 2010, it sheds light on the nature of these claims, the avenues through which such impacts may be realized, and the degree to which such impacts have occurred or are occurring under the current structure of LRP in Uganda. We begin by providing a background on LRP and its importance specifically in Uganda. We provide an overview of the data employed and the theoretical framework and methodology. We then present a conceptual framework for thinking about the avenues for impacts on key outcomes in agricultural commodity markets. We provide an overview of what claims have been made, particularly with regard to consumer price impacts, agricultural benefits, and stimulation of agricultural markets, followed by our findings in Uganda in these areas. The final section summarizes the findings and implications for policy and for future study of local and regional procurement in developing countries.

¹ Information provided by WFP / Uganda

Overview of Local and Regional Procurement

Local and Regional Procurement (LRP) is growing in significance as a method of procuring food assistance for food insecure populations. LRP is an emerging alternative to traditional direct provision of trans-oceanic food from donor countries, which involves purchasing foods either in an affected country (local purchase) or in a third country (regional or triangular purchase). While the potential advantages of LRP, such as cost and time savings and the possibility of bringing more capital into African agricultural markets, have been noticed for decades, the practice is just now gaining ground due largely to sociopolitical developments. Wealthy nations have historically been generous with food aid under the de facto condition of simultaneously supporting their own economies: what is called “tied” in-kind aid is provision of surplus commodities directly to developing countries. Due in part to agricultural subsidies in OECD countries such surpluses have historically been abundantly available, in particular from the United States, Canada, and European countries. Over the past 20 years food aid quantities have ranged between 5.5 and 16 million tons annually. In recent years the majority of this has been emergency food aid, with approximately 20% dedicated to program and project aid (WFP 2010).

Relatively recently a trend has emerged to un-tie food aid. LRP has increased in value over the past decades, from 13% of all of food assistance in 1995/1996 to 22% in 2004/2005 to 50% of all food aid in 2009 (Tschirley and del Castillo 2007; WFP 2010). The European Union got on board with LRP starting in the late 1990s. By 2006, 97% of food provided by the EU was procured locally or regionally (Clay 2010). Up to 2005, Canada still allowed no more than 10% of its food to be provided through LRP. On signing the Paris Declaration in 2005, they upped that figure to 50%, and further to 100% as of 2008 (CIDA). Even the US, long to hold-out on LRP, is starting to consider its advantages. The U.S. Farm Bill in 2008 provided the USDA with \$60 million over 4 years to support pilot LRP programs, and USAID separately received twice that sum under the Supplemental Appropriations Act (Hanrahan 2010).

While studies on the relative merits of LRP are still by and large few and unsatisfactory, its potential in many areas is becoming alarmingly clear enough to spark both policy and research attention. A trend is emerging to examine its feasibility and assess its benefits and risks

as well as more broadly to compare in-kind aid to a broader range of food assistance policy options.

The World Food Program (WFP), with cash funding primarily from the EU, is by far the largest player (Tschirley and del Castillo 2007). WFP reports that the quantity it purchases has tripled since 1990. As of 2007 it was purchasing approximately 900,000 metric tons of food annually in Africa, and 1,700,000 between Africa, Asia, and Latin America (WFP 2007). Purchases take place largely through national-level tender, opening to bids given contractual conditions that include quantity and price as well as quality and safety specifications. Other organizations, including NGOs, are starting to engage in local procurement of food for both emergency and non-emergency programs.

While a large amount of food has been purchased locally, the larger amount is via triangular transactions, such as buying food in Uganda for refugee camps in Rwanda and food crises in the DRC. About 75% of triangular transactions involve buying food in developing countries. The single largest source of regionally procured food in Africa is the East African bread basket of Uganda (WFP 2007). Uganda is an exporter of a variety of food products, including millet, maize, beans, and vegetable oil, which have been the primary goods procured. Food from Uganda has been used to supply refugee camps in Uganda as well as neighboring countries, as well as emergency and non-emergency programs. WFP began buying food in Uganda, primarily from large traders in the capital Kampala, starting in 2000. In 2009, the value of total procurement reached \$50 million, and is stated to triple next year (Daniel Molla, WFP Uganda). This makes Uganda an ideal location for studying LRP.

A conceptual model for the impacts of LRP on markets

Unlike traditional food assistance, which incurs an effective shock to food supply in a developing country, LRP incurs a shock to demand. The impacts are hence in many ways comparable to those of any demand shock in a marketplace, with some variation due to the fact that it is due to a single buyer, with known contracting mechanisms and quality standards, entering the market.

First and foremost, upward pressure may be placed on consumer prices due to the shift in demand. Consumer price impacts may however be complicated by the nature of agricultural commodity markets. Agricultural commodity prices are cyclical, starting low during the peak

harvest season and rising with increasing scarcity (and in this case dryness of the grain) until the following harvest. Given this variation and the semi-durability of maize grain, traders arbitrage over both space and time, and hence speculate on prices and profit from these predictable variations. An outside agency purchasing food for food assistance may attempt to purchase grain when prices are low and quantities abundant; in some cases, foods would then be distributed later to food insecure populations when prices are high and quantities scarce. This countercyclical purchase and distribution would theoretically counter the price fluctuations, lessening the seasonal variation in prices. However, traders' speculation can un-do this effect. In particular, if traders have access to both credit and information and hence the capacity to speculate on the agency's purchases as well as on predictable seasonal variation, agency purchases could induce greater speculation and hence lead to exacerbated price variation.

Contingent on the nature of supply response, we might anticipate agricultural benefits for producers due to increases in prices and quantities demanded. The increase in consumer prices may be transmitted to producers. This can occur through the direct draw on quantity demanded, which would draw on traders' supply and farmers' supply and put upward pressure on producers' prices. It could occur less directly due to the potential for trader entry into markets, resulting in an increase in both competition and demand for farmers' goods.

Markets may likewise be stimulated through several avenues. One possible avenue would be through increased employment in the sector, such as through trader entry or other employment generation due to increased quantities. Increased wages or agricultural rents could instead result due to incentives to increase productivity. Credit markets may likewise be enhanced due to the introduction of a significant and credible buyer, and through reliable contracts.

An additional dynamic that may occur lies in impacts on product quality. If quality standards are known and surpass local standards, then this could induce value addition activities on the part of suppliers. Value addition would potentially lead to greater profits, enhancing possibilities for further value addition and hence expansion into new markets. For the case of maize in Uganda, quality is traditionally low, limiting access to export markets. However, if the quality standard of an outside buyer leads to a 'race to the top' in the product market, Uganda's producers could gain access to other export markets in Africa or elsewhere.

A diagrammatic representation of the model

A model encompassing all of these impacts, avenues, and dynamic feed-backs could be viewed through a systems approach that allows for integration of several key components. This can be envisioned as a transfer of grain stock from farmers, then to traders, then to final markets, as represented visually in Figure 1 (below).

Farmers have a fluctuating stock of grain fed by production, which is augmented primarily by investment in inputs. Farmers face price uncertainty and cannot influence prices directly, but they know that as farmers' stock increases, seasonally or due to other shocks, it puts downward pressure on producer prices. Producer prices are then positively associated with farmer profits, which induce investment in value addition and/or inputs. Input investment increases production, while value addition can have direct upward pressure on producer prices. Value addition can also include proper storage, which can allow farmers to hold off on sales until prices are higher. Farmers sell to traders, transferring grain to traders' stocks. They optimally want to sell when stocks are lower (not during the peak harvest) because at this point producer prices will be higher; however, they may be induced to sell more and earlier by urgent needs. The size of the traders' stock also puts downward pressure on producer prices.

Traders then sell to other traders and/or release grain to the consumer market. Intermediary prices would have similar dynamics as producer prices, but are left out for simplicity. Timing here is again essential; traders prefer to release grain into the market when supplies are lowest, and/or to otherwise time sales when consumer prices are highest. They face price uncertainty but know also that the size of the stock in the market puts downward pressure on consumer prices. Speculation on price increases hence slows the rate of flow to market. Consumer prices are naturally associated with traders' profits, which both can induce trader entry into the market (subject to various barriers) and encourage sales.

LRP and other demand both decrease market supply (by contributing to the outward flow), putting upward pressure on consumer prices. However, LRP is different from other demand in a few important ways. It is arguably less sensitive to consumer prices, as LRP purchasing decisions are made through contractual arrangements and respond more slowly than those of other buyers. Also, the single large outside buyer may lead to direct trader price speculation. Lastly, LRP introduces demand for a higher quality product, and hence directly encourages value addition by traders.

The several “avenues” for impacts of LRP that were discussed above emerge from this model. We focus on the outcomes that are of key policy interest: impacts on consumer prices, indicators of agricultural benefits, and indicators of market stimulus. Consumer prices enter the market directly. Producer prices, farmer profits, and investment in inputs or value addition indicate agricultural benefits, and trader entry and credit access are indicators of market stimulus.

Examining the model indicates that consumer prices may be impacted as follows:

- LRP draws on market supply, putting upward pressure on consumer prices.
- LRP leads to price speculation by traders, which slows the flow to market, decreasing market supply and hence putting upward pressure on consumer prices.

Agricultural benefits may accrue through impacts on producer prices as follows:

- LRP draws on market supply, which draws on traders’ stock and farmers’ stock, both of which then put upward pressure on producer prices.

Assuming consumer price increases, we could see also:

- Consumer prices increases lead to increased trader profits and in turn increased sales. This decreases traders’ stock, putting upward pressure on producer prices, which increases farmer profits and may induce investment in value addition and/or inputs.
- Consumer price increases lead to increased trader profits, and in turn trader entry; if these traders are *aggregators* then this leads to a draw on farmers’ stock which puts likewise puts upward pressure on producer prices. However, if purchases are only stocked and that effect dominates, than we could even see as a result downward pressure on producer prices from trader entry, or agricultural disincentives.

Other market stimulus may come about directly as follows:

- LRP leads to value addition activities at the traders (directly and indirectly through enhancing credit access). This raises consumer prices, increasing trader profits and inducing trader entry.
- LRP leads to value addition, and induces a reinforcing loop whereby consumer prices increase, profits increase, and traders invest further in value addition.

Review of literature and claims

There has been a great deal of discussion of the possible benefits and risks of LRP, but actual evidence supporting or refuting these claims is still thin. Much of the available literature lies in the realm of program reports and policy evaluations. Many of these studies were commissioned by agencies heavily invested already in one method or the other, and/or by governments facing policy constraints and/or economic conditions that favor one method or the other, which may bias the questions examined and/or the results. In addition, most studies suffer from being narrow in scope, small in scale, and/or lacking in counterfactuals that make comparative analysis possible. Evidence is often considered more broadly than it ought to be, and many criteria of interest and possible impacts have yet to be examined at all.

That said, several possible benefits and risks have been identified. Positive claims include that LRP is cost-effective and faster relative to traditionally procured food aid. It is also claimed that it can provide foods that are more appropriate, nutritionally as well as culturally. Larger development-oriented claims are that it can benefit developing country agriculture, and strengthen food markets.

Claims of risks or potential concerns include both immediate and longer-term possibilities. Some divide these concerns into “primary” and “secondary” concerns, the primary concerns being more likely factors that donors are responsible for following up on, and secondary concerns encompassing a broad range of longer-term concerns that are often waved off as somewhat unlikely and/or too hard to measure with any certainty. The risk that the surge in demand from outside buyers will inflate consumer prices, potentially adversely affecting poor net-food-buying consumers, is a primary concern. Other market-related concerns include possible aggravation of price-instability due to the inconsistency of food purchases, as well as more structural market disruptions resulting from creating temporary markets. Some fear as well that the possible market benefits will accrue to only a few large-scale farmers and/or traders, and may even put small farmers at a further disadvantage. The other primary concerns include problems with contract enforcement and traders defaulting on tenders, and, often most significantly, concerns about food quality and safety resulting from the lack of local enforcement of standards and difficulty in ensuring that they are met (Tschirley and del Castillo 2007).

This paper focuses on the claims relating to consumer price impacts, market impacts or distortions, agricultural benefits, and quality concerns.

Agricultural and Market Benefits

LRP is favored due to its potential for generating agricultural benefits and/or for stimulating markets in developing countries. However, thus far studies that attempt to address these areas present little more than hypothetical claims. These claims include that LRP can help farmers by linking them to markets, and/or by encouraging farmers to engage in value addition activities. It is also suggested that markets can be stimulated through the possibilities of labor creation and/or bolstering trade (Tschirley and del Castillo 2007).

A few such claims were more specific, but have yet to provide evidence. Coulter (2007) claims that local procurement provided greater benefits to urban and rural populations than direct transfers in the case of the WFP's activities in Uganda and Ethiopia. Davies and Menage (2010) present preliminary findings on WFP's Purchase for Progress Initiative stating that buying locally had thus far helped to improve farmers access to markets, post-harvest handling, and perhaps improve access to credit through farmers' associations.

Price impacts

Studies critiquing LRP tend to focus on consumer price hikes. Most studies (such as those already cited) address the question of potential consumer price hikes briefly and report finding no conclusive evidence that this should be a significant problem. Some analysts focus on quantity impacts alone, and have proposed that the risk of price impacts should be taken seriously when procurement volumes reach 10-20% of a country's marketable surplus (Tschirley and del Castillo 2007). WFP monitors prices over the course of procurement, and has a policy generally of ceasing procurement when locally prices exceed import parity. Some claim that this avoids the potential for actually impacting price fluctuations. One exception may have occurred in Ethiopia, where it is suspected that local procurement may have contributed to the food insecurity situation in 2006. Although evidence is unclear, the Government of Ethiopia assessed that a combination of procurement and traders' speculation on prices led to severely increased consumer prices that aggravated the problem (Tschirley and del Castillo 2007).

Another time and place in which this is suspected to have occurred is in Niger in 2005. A combination of factors coincided including locust infestations that affected harvests in 2004, the removal of price ceilings on foods in 2002, government action to officially close the borders to

food imports in 2005, and trader speculation, that are thought to have severely aggravated the price impacts of local purchases. Supplies were already scarce, and hence purchases led to acute scarcity in certain regions and price increases on available food to levels out of the range for local consumers. The population generally already suffers from a great deal of structural poverty that constrains its access and adaptability (Wilding 2005). In both of these cases identifying the causal role of procurement is next to impossible due to lacking data on key variables as well as a confluence of different confounding influences on prices.

Data and methodology in Uganda

Survey data

In June of 2010 we undertook a USAID-funded pilot study in Uganda, a cooperative undertaking between Cornell University, Makerere University, and CARE Uganda, for the purpose of simultaneously developing methodologies to operationalize Market Information and Food Insecurity Response Analysis framework (MIFIRA) in the field and to contribute to the understanding of the past and potential impacts of LRP in Uganda. The methodology was to build on existing secondary sources by developing a trader survey designed to answer questions about the market structure and traders' constraints and experiences. For example, we asked each trader how many traders of his type were in the market, and developed a relatively good idea for the numbers of suppliers at different links. We asked a number of questions about seasonality, prices, volumes, and profitability.

We surveyed 150 maize and bean traders including aggregators, wholesalers, and brokers. We focused almost exclusively on maize (119 traders), following the supply chain from the primary purchasing point in the capital of Kampala to both small and large source markets in the East and North. A map of Uganda with trade flows for maize is provided in Figure 2, and the coverage of the survey by trader type and location is represented in Table 1. We also spoke less formally, both in interviews and focus-groups, with a number of key informants, including traders at every level of the chain as well as processing industry representatives, company heads, market officials such as chairmen of traders' associations, representatives from farmers' associations, and local policy actors with experience in food procurement and distribution.

We obtained a wide range of evidence, both quantitative and qualitative, some anticipated and some somewhat surprising. It is not possible to measure the outcomes of interest, such as

changes in price level or variability, agricultural benefits, and market stimulus resulting from LRP in Uganda over the past decade, directly, and as such this evidence does not do so. It elucidates instead the pathways through which these impacts can occur, and sheds light on the degree to which it is likely that they have been occurring or will occur going forward, with the current structure of procurement. In so doing it addresses many of the claims and concerns about LRP and reveals the potential for impacts that have yet to have been discussed. It also informs policy on what kinds of questions to ask and data to collect in attempting to evaluate LRP and address these concerns in the future.

Theoretical Framework and Methods

The Market Information and Food Insecurity Response Analysis (MIFIRA) framework was proposed by Barrett et al. (2009) as a tool for understanding which modality of food assistance is the most appropriate response in a given food-insecurity context. It presents a logical sequence of questions that need to be addressed in order to assess whether cash, transoceanic food, or locally or regionally procured food is most appropriate. These questions stem from the basic decision-tree proposed by Barrett and Maxwell (2005). The first question, whether local markets are functioning well, addresses whether or not cash is a viable option given the demand and supply conditions in the affected region. In order to answer this question we need to consider both the supply and demand sides of the market equation. MIFIRA here breaks the question down into:

- 1a. Are food insecure households well connected to local markets?
- 1b. How will local demand respond to transfers?
- 1c. How much additional food will traders supply at or near current costs?
- 1d. Do local food traders behave competitively?
- 1e. Do food insecure households have preferences over the form/mix of aid they receive?

Assuming that the answer to the above recipient-oriented questions point away from cash transfer options, the next actionable question is whether or not there is sufficient food available nearby to meet the needs assessed. It is not enough to know where markets are; we also need to understand their nature and likely impacts of procuring from them. MIFIRA proposed the next sequence of questions hence as:

- 2a. Where are viable prospective source markets?
- 2b. Will agency purchases drive up food prices excessively in source markets?

2c. Will local or regional purchases affect producer prices differently than transoceanic shipments?

The answer to these source market questions, while still complex and open to a great deal of nuance and interpretation, guide the process of deciding where food can be procured most efficiently while not leading to unintended impacts that inflict harm.

Uganda has long been the East African regional hub for procurement of food aid. Food procurement in Uganda presupposes that neighboring destinations have been identified that have a food need that is best met by in-kind transfers. Uganda's markets are then the response question 2a: "Where are viable prospective source markets?" Demand-side considerations are nonetheless quite relevant for Uganda, both for the communities who do receive food aid and for consumers, even if they are by and large food producers. While the majority of Ugandans are farmers, they are smallholders who, as suggested by prior literature, are still dominantly net food buyers. Hence upward pressure on consumer prices due to LRP are still of great potential concern. Uganda is significant and growing as a source market for African food aid. The questions that are most pressing hence are those that concern the supply-side, namely questions 1c, 1d, 2b, and 2c. For each of these questions we developed analytics, and then developed our survey to address those analytics. An example of the ways in which MIFIRA's analytics were addressed by the survey questions is presented in Figure 3.

Evidence from Uganda

The questions within MIFIRA that we chose as a focus for Uganda color which of the claims and concerns about LRP that the evidence gathered is fit to address. Issues pertaining to programming logistics such as cost savings and timeliness relative to transoceanic food aid, trader default, and food safety assurance concerns, while important, are not the focus here and have been examined in other studies (mentioned above). Demand-side questions such as nutritional or cultural appropriateness of food, while also very relevant, require focus on recipient communities and not on the source markets that were the focus of our study.

Impacts on consumer prices are perhaps the primary focus of attention in the literature and for donors and policy-makers, and our study makes strides in examining the avenues and dynamics of these impacts. These are important because they link directly to questions of agricultural benefits and market stimulus. Whether or not we see agricultural benefits is a

question of who stands to gain, encompassing fears that markets may be distorted by skewed benefits. Respondents revealed a great deal to us about the structure of the maize market in Uganda and how it shapes the answer to these questions. Market stimulus can be examined through the avenues of credit market impacts, which we can learn about by examining trader characteristics, cost structures, and experiences with credit. Labor market impacts, such as the potential for job expansion or wage increases, are also possibilities for market stimulus. Questions of quality are often considered concerns, with respect to local standards not being up to the level of international standards and/or being difficult to enforce. Ugandan traders revealed that there is a more broad range of issues related to quality that lends itself to examination, both potentially promising and perhaps troubling.

Consumer price impacts

Impacts on price are generally attributable to volumes purchased in a market, and examined by looking at price trends over time. Production and export volumes in Uganda and procurement volumes of WFP, along with wholesale and procurement prices for available years, are presented in Table 2. These prices are average prices paid by WFP annually, buying generally during all periods of the year, with standard deviations (based on weekly price data) included. While the procured quantities are significant—the WFP is indeed the largest single buyer in Uganda—there is no apparent identifiable correlation between the volume procured and price levels or fluctuations. Moreover, we cannot claim to be able to establish a link between the two with the data available.

However, when we discussed prices and profitability with traders it was very common to find that traders believed that WFP has had an impact on the prices they face and their profitability. We asked which years over the past five years (2005-2009) were the “most” and “least” profitable and why. Although we did not ask specifically, most traders mentioned famines in neighboring regions as a reason for years being their most profitable. Many also attributed the cause to WFP. Some explained this as a relatively direct cause, ie that WFP was buying for a food shock somewhere so prices were high. Others explain this as an indirect effect, ie that since WFP was buying there was scarcity among millers, so they could benefit from increased prices.

In considering potential price impacts it is not sufficient to evaluate simply what quantities are purchased and prices paid relative to the current market; it is also important to consider how

these quantities and prices will be perceived by traders and traders' capacity moreover to speculate prices and reap the benefits of speculation. If traders suspect that prices are going to increase due to agency purchases, they are likely to speculate on that increase, buying more while prices are low in anticipation. This could potentially even bring about an actual price effect where there otherwise would have been none, as some suspect happened in Niger in 2005 (Wilding 2005). Likewise, even if agencies manage to time purchases so as to purchase when prices are low and hence mitigate the seasonal price differentials, if traders have access to credit they can "out speculate" the agency. The areas of evidence that can elucidate the degree to which consumer prices may be affected, then, are trader price speculation and stocking. In addition traders must have access to credit in order to act on price speculation. Our evidence shows that price speculation and stocking are common practices. Although due to negative preconceptions about stocking many traders were hesitant to admit to this directly, they revealed all the same that this had been the case in the year of our surveys. Several traders complained about having anticipated price increases and been disappointed; they held off hoping that the prices would rise, but eventually, as the next season was approaching, had to dump large quantities on the market at a loss. We also learned of the trend on the aggregate among traders by asking about seasonal sales and purchases. Figure 4 shows the reported average monthly sales and purchase volumes for Kampala and Jinja wholesalers, who are the group of traders with most direct access to outside buyers. Even though these figures are self-reported recollections of quantities purchased and sold by month, the trend of stocking is very clear; the hum for purchases falls around the peak season and for sales in the hungry season.

Combining this with common reports of the link between the WFP's purchases and profitability, as well as the common belief expressed that the WFP pays high prices, would strongly indicate that outside purchase has accentuated price speculation. Some traders even stated that the low price and lack of profitability this year was due to the WFP's failure to purchase anticipated quantities, and/or the lack of a food crisis in a neighboring country.

With respect to credit access, traders' access to credit generally increases with their volume of trade, as shown in Table 3. Of the largest volume traders, 82% reported receiving credit, whereas among others rates were between 41 and 64%. Only the largest traders reported receiving sums of credit from "business fellows"; this is not credit from suppliers, but rather fellow businessmen who engage in a similar level of trade. More of the larger traders also

reported receiving credit from official sources, and they on the whole reported greater ease in receiving large sums.

Additionally, however, we learned that large traders who have access and/or knowledge of the WFP contract systems were known to use these contracts to enhance their credibility and obtain more credit, from both formal and informal sources. A few traders reported doing this themselves; others, however, reported providing credit to larger traders based on the promise of WFP contracts, which are commonly known to be reliable and to stipulate payment at a delay of up to 30 days. There was some discussion that traders used a single WFP contract for a certain quantity to obtain grain on credit from a number of smaller traders, in total quantities far in excess of the quantities stipulated in the contract. This allows them additional ability to out-speculate any moderating impact that agency purchases could potentially have on prices.

Further evidence in this area came from asking traders how much they would be willing to supply given current costs and prices. We asked this as a hypothetical question: “If demand increases such that you are able to sell all that you want at current prices, what is the maximum amount of maize grain that you would want to sell?” We then asked how much time it would take to provide that amount both in the “peak season” and “now” (late June to early July of 2010, corresponding to the lean season but near the beginning of the next harvest), as well as what factors limited ability to acquire that quantity quickly. Trader responses show that they perceive the maize market in Uganda to be very flexible, and their access to it seemingly infinite. Table 4 shows the hypothetical volumes per day that traders said they would want to supply, on average, divided by traders’ volume, and by percentage over what they are currently supplying. Traders of the scale likely to sell to a buyer like WFP are those who offered that they would want to supply astronomical volumes relative to the others. This is a strong indication that they are making profits by selling, and perceive limited constraints to selling greater quantities.

This indication was further confirmed by responses to the question of what factors constrain the ability to provide more and faster. While aggregators in rural areas cited issues related to availability from farmers, road quality, and seasonality, brokers and wholesalers in larger markets rarely mentioned these constraints. When pressed, many stated that commodity availability would never be a concern, and they would just switch their source region depending on the time of year and situation. These large scale traders are precisely those that supply maize to WFP. Several of the brokers, who serve as the last link between the companies that contract

with WFP and more rural aggregators, had difficulty answering this question because they couldn't understand why there would ever be a limit. They bear almost no cost outside of their time, implying that greater quantity means greater profit. Their primary stated constraint was simply the degree of trust that their suppliers have in them; the more they are trusted, the more suppliers come to them, and the higher quantities they can broker to companies and other buyers. While this particular response was unique to very large brokers, only 13% of all traders considered the availability of maize as a factor limiting how fast they could supply; 10% cited availability of transportation. A majority (60%) cited availability of cash as the primary, and often only, constraint. Under the current structure of procurement it is hence the largest traders who are geared to reap the benefits of LRP, implying further concentration of an already concentrated market.

Agricultural Benefits

WFP's purchasing practice in Uganda is to buy in quantities of a minimum of 500 metric tons per purchase. This quantity is known to producers. WFP suspects that over 90% of the maize it purchases in Uganda is sourced from smallholders who own on average only .3 hectares each. Only 30 sellers are approved to sell to WFP, however, and of them only five are repeat suppliers.²

We mapped the supply chain (Figure 5), revealing the distance between poor farmers and outside buyers, particularly of high quality, dry, white maize. Sometimes as many as six intermediaries arbitrate over space and time between the smallholder and a buyer such as WFP. Some of these aggregate from smaller quantities to create larger purchasing quantities for other buyers; some add value, such as drying, fumigating, cleaning, or milling; some are brokers who simply connect buyers and sellers across time, space, and languages. The relative market power is and information is variable down this supply chain.

The farmer generally sells grain directly to aggregators. Aggregators are traders who make numerous purchases of varying sizes that are then resold in bulk to other aggregators or to wholesalers. This is a broad category, and is divided into sub-categories in order to capture more nuances about roles and market power. The roles—and names—of aggregators vary along the

² From conversations with Daniel Molla and Kenneth at WFP Uganda.

supply chain and throughout the country. Those referred to as “stores” are stationary and aggregate maize from sometimes hundreds of local farmers. “Transporters” are usually larger aggregators with their own capital who purchase and deliver maize. “Purchasing agents” are aggregators to whom larger traders advance funds to purchase maize on their behalf.

Traders and informants universally reported that there are more than 50, and often hundreds, of farmers who sell to each buyer at the aggregator level in the chain. Traders at this level benefit from farmers’ limited access to information and even more from their capacity and capital constraints. Farmers bring small quantities often long distances to markets, and need to sell them to meet immediate needs. They usually cannot afford to retain the grain to sell at higher prices later, and given the small quantities they cannot afford to travel further to sell to other traders. In some cases farmers’ lack of information, such as about the timing and degree of price shocks or fluctuations, gives aggregators specific ad hoc power over prices paid. One aggregator in a small village outside of Jinja reported that he received the most profit when there were shortages or shocks in other regions that temporarily drove up the price. He explained that while traders would learn of this quickly, farmers always learned with a delay; he had the opportunity to make a killing in the interim.

It is commonly thought that simply informing farmers of market prices will help them to obtain fairer prices for themselves. However, even if farmers learn global prices they rarely know the kind of detail that traders know. They may learn, for example, that maize was bought at \$0.12 per kilogram in Mbale, but they don’t know what quantity was bought, what the moisture content was, and whether or not other processing or cleaning took place in the interim. They also are less knowledgeable about the costs associated with marketing maize. For example, they may not know the current prices for fuel, transportation, loading and off-loading of bags, nor of other processing such as fumigation, cleaning, drying, and milling. All of these can be used by traders to excuse or justify the low prices they offer relative to reported prices in larger cities.

Other information details can be used to a traders’ advantage. For example, in many small village markets, where the bulk of Uganda’s maize first exchanges hands between farmer and trader, scales are either limited in number or not at all available. A relatively universal volume measure of a “cup” (literally, a plastic cup) is used instead to measure quantities for purchase. While traders daily go to larger centers and transfer cups to kilograms, farmers don’t

necessarily have a way of knowing exactly how many cups are in a kilogram. One trader in the small market of Sawagere indicated initially that two and a half cups were one kilogram; however, she then reported that the price for one cup was \$0.04 and the price for the kilogram in Soroti (60 kilometers away) was \$0.09. When the fact that this left her with no payment for transportation and no profit, she recalled that perhaps it was something between two and two and a half cups per kilogram, leaving her up to \$0.02/kg for her transportation costs. The number of cups per kilogram will change also as the maize dries and loses weight (which increases its value per kg). Traders, who have access at point of sale to scales, are much more likely to be aware of this difference and of the ‘actual’ measures than farmers, who can thus be taken advantage of even if they are aware of what the going price per kilogram is in the major market.

Even if information about prices and costs is known by farmers, there is not necessarily anything that they can do to benefit from that knowledge, since their location and small quantities produced leave them with very limited bargaining power. Most small farmers live far from major markets and produce quantities that are too small to justify individual transport to larger marketing centers. They also do not usually have capital available to engage in any kind of value addition, or even to store their maize and wait to benefit from seasonal price fluctuations.

There is evidence in the Ugandan market that farmers engage in “sell-low, buy-high” behavior, selling while prices are very low and while maize is damp and of low value, and occasionally even re-buying again at higher prices later in the season to meet food needs. While this may seem to be irrational, it is actually evidence of displaced distortions, which Barrett (2007) explains as a quite rational response to a situation of binding liquidity constraints. Farmers’ selling at low prices while facing immediate cash needs is effectively equivalent to taking out loans against their future; the (high!) interest they pay is in the lost benefits that could have been gained by holding onto the maize and selling high or by value-adding activities, as well as in the premium paid on grain if it is bought again later. The traders who can afford to engage in this inter-temporal arbitrage effectively serve the role of banks, and earn interest in the form of gains made due to inter-seasonal price increases (Barrett 2007).

Evidence of displaced distortions in Uganda’s maize market was apparent. Farmers we spoke to described the nature of seasonality in Uganda and the pressing need to sell quickly in order to get the maize off the ground and have money for the next season’s seeds. Traders

confirmed farmers' desperation to sell. Several said that they had observed that farmers seem to accept just about any price, even when it means selling at a loss, especially at particular times of the year. Those times of the year, cited as the 'best times to buy' by many traders, were the planting season when farmers need money for seeds and other inputs, the beginning of the school year when school fees are due for farmers' children, and around the holidays when money is needed for holiday expenses. This phenomenon has significant implications for the distribution of the benefits of LRP. Agency purchases demand forward contracting, search costs, and provision of grain in advance of receipt of money. For smallerholder farmers in Uganda, this presents a brick wall of impossibility; they cannot afford to plan in advance, or store or process grain, all before being paid for it. Moreover, nor can most of the traders that stand between them and the final market.

After aggregators, the next step up the supply chain is the wholesalers. They tend to buy already large quantities from aggregators and then resell; they often engage in some kind of value-addition, such as drying, stocking, or milling. They then re-sell to other wholesalers (some of whom mill), large companies, schools, and retailers. By and large it is the large companies meet high quality standards set by the WFP. Many of these transactions are facilitated by brokers, who rarely bear any significant costs but simply connect buyers and sellers. Some traders seem to view brokers as service-providers, saving them the time and energy of finding suppliers or buyers, translating for them, or the like. Others spoke of brokers more as a necessary evil, with whom they were effectively obliged by the structure of the system to share their profits.

While a walk through Kampala's Kisenyi market, amidst the droves of small and large millers selling 100 kilogram bags of grain and flour, will give one the feeling that the market is competitive, wandering around a step or so back in the chain leaves one with a very different feeling. While farmers are rarely members of farmers' associations, traders commonly are, especially the largest traders. The strongest associations of traders that we encountered were those of the brokers in Jinja and Kampala. The Kisenyi millers nearly all spoke of the fact that when aggregators arrive in the market they sell only to members of "the association," and that this association in turn sells to millers. We eventually spoke to a few members of this association, the Millers, Traders, and Off-Loaders Association. Although we didn't get an exact number, the association generally consisted of rather few (<30), mostly Muslim brokers who

transact hundreds of tons per month each and are the primary link to at least three of WFP's main five clients. A similar association, the Jinja Produce and Millers' Association, exists in Jinja, where other major companies process maize for WFP and for export. This association has 30 members, all brokers, who effectively control flows in and out of the market. They claimed to broker all transactions between aggregators and the millers and companies in Jinja. When asked if a miller must go through them or if he could buy directly from an aggregator, the director of the association responded, "It depends, but it's like a must." He further explained that a miller could in theory purchase maize directly, but that the Jinja Produce and Millers' Association pays the off-loaders—so no one will off-load the maize unless one of them is present.

This was confirmed both by millers within Jinja, who reported having to go through brokers, with a very few exceptions only when volumes were particular high or maize was floating. A few aggregators from the surrounding area discussed it as well, in the form of a complaint that "if you sell in Jinja, you must go through the brokers!"

What this all implies in effect is significant barriers to entry for traders at several levels of the supply chain. Returning to the conceptual model, a way that agricultural benefits could accrue to farmers is if traders enter the market due to increased consumer prices. This would then increase demand and competition at the farmgate, putting upward pressure on producer prices. However, trader entry at several levels in the chain—not in the least the level closest to farmers—is challenging, severely limiting the possibility for this type of benefit.

Stimulation of agricultural markets through labor

The idea of agricultural market stimulation encompasses entry of new traders into the market. It could also include employment of new workers, and/or increases in wages for workers already in the market due to productivity improvements.

LRP effectively induce a demand shock into the system as a major buyer enters the market. We might imagine that with more grain being purchased there will be opportunities created for new traders to enter the market. Assuming that traders engage employees, this will generate employment not only directly but indirectly. A second avenue would be that existing traders expand their operations. This would generate employment if that change in scale involves taking on more employees. A third avenue would be through a simple marginal impact on wages through increasing the volume in trade and hence the productivity of labor, assuming

that existing traders simply increase volumes incrementally to accommodate increased demand. Our data in Uganda can speak to the potential for employment creation through each of these avenues.

The possibility for the first avenue rests on the hypothesis of market entry which as described above is limited in this market. Trader characteristics are listed in Table 5, separated by volume traded. While the average number of years trading is high across all categories, the minimum number of years for the smallest traders was less than one while for the larger traders it was 5 years. There is also an ethno-linguistic element to trader dynamics. The general percentage of Muganda and Musoga traders increases as traders increase in sales volume. More anecdotally, the brokers who have significant sway Kampala were almost all Muslim. While more work could be done on this, it is clear that it is not only cash and credit barriers to entry that limit access to high volumes in the market. The fact that “trust” is commonly cited as important in the choice of suppliers is also telling, as trust is something that is built over time and stronger within family and ethnic groups.

The other two avenues can be examined through traders’ expenditures on employment. Tables 6-8 present the traders’ labor cost profiles. Employment is not a significant part of traders costs. As traders increase in volume, they are not necessarily likely to take on more employees. This is demonstrated in the tables; the percentage of cost spent on labor as volume increases. In addition, brokers consume a significant portion of the value of this market. The business of brokering was the most based on trust and long-standing relationships, and hence likely the hardest market to enter. Well-connected brokers can expand their quantities largely and rapidly, but it would be next to impossible for a new broker to receive a large contract. Brokers in addition have no costs, generally, and as such employ no labor, so increasing scale for brokers implies no employment effect on the market.

Food Quality and Safety

Quality issues are brought up in the literature as a simple concern for local traders’ ability to meet food quality and safety requirements; some claim that local standards will not be up to international standards, and/or that they will be difficult to verify. WFP has dealt with this issue very carefully. The contractual agreement to sell to WFP contains very specific quality

specifications. Maize has to be of the large, white variety typical of Kenyan hybrid seeds, and has to meet a list of 13 requirements, mainly:

Moisture content $\leq 14\%$

Damaged grain $\leq 2\%$

Broken grain $\leq 2\%$

Immature / shriveled $\leq 1\%$

Chaffe $\leq 0.5\%$

Aflatoxin ≤ 10 ppb

...

From what traders report, there has historically been no price differentiation based on quality in Uganda's maize market. Price is based on weight, and although quality is 'checked' (by poking a pick into the bags at different spots and spilling a few grains out), this is not systematic and is by a method that would allow for a fair amount of slippage. One might suspect that this would lead to a downward spiral in quality, with incentives against drying and removing pests and toward even 'packing' the maize with foreign matter to increase the weight. Most traders agreed that this is a longstanding problem, and is part of the reason that trust is an important factor in choosing suppliers.

Many report that this situation has changed since WFP started procuring maize in Uganda. The reputation of the WFP contract spans much further than its actual financial reach; traders many steps down the line, all the way to minor rural aggregators who have nor will ever likely have any direct experience with WFP, tend to know (or think they know) four things:

- (1) WFP is a massive buyer, the largest in Uganda
- (2) WFP pays a premium for maize
- (3) WFP pays at a delay
- (4) WFP only buys high quality, clean, dry maize

Although a quality standard in principle does not always translate to one in practice, in this case it would appear that the bulk of maize delivered is verified fairly rigorously; most approved suppliers, for example, use one of very few high quality processing centers to clean and dry the grain. The introduction of such a standard has the potential to have various effects. Two primary possibilities have been identified in the literature. One is that it could lead to a 'race to the top,' and general improvement in quality standards in Uganda. The other is that it could lead

to a separating equilibrium, in which two separate prices emerge, one for high-quality maize destined for WFP and the other for low-quality maize destined for the local market.

Tables 9 and 10 show how traders experience quality in the market, which is to say which of them test for quality, perceive that it costs more, and actually undertake quality-improvement by drying after they purchase. Table 9 looks at these questions by trader type and scale, and Table 10 by trader location. Testing for quality is generally a prevalent practice, as one would suspect given what was described above. As a general trend, however, the closer one is to the farmer the less likely traders are to consider that quality costs more. In Dokolo, a small aggregation town between Soroti and Lira, many responded that quality does not fetch a higher price. Many traders when pressed on the issue would say that in buying from farmers there was no difference between high and low quality, but at other points in the chain, ie selling to big city wholesalers, there was a difference. A couple of large traders in Kampala started by saying that they didn't care which quality maize they bought, and then refined the statement by saying that it did indeed matter, but that they had clients for both; they could sell just about any maize to the local millers, but reserved the highest quality for the large companies. Much of this evidence points to the emergence of a separating equilibrium.

Summary and key policy implications

It emerges from this evidence from Uganda that we need to be careful about the assumptions made regarding the impacts on markets of local and regional procurement. The claims made about risks and benefits can have real implications that are important and must be considered in weighing the costs and benefits of different food assistance modality options. Where it is difficult or even nearly impossible to provide direct answers to the questions at hand, such as when one cannot directly measure the outcomes of interest, one should not just throw up ones hands and hope for the best. One can instead think critically about the avenues through which these impacts are likely to occur, knowing that they can be numerous and complicated. One can explore these avenues and ask questions about the relevant processes. One can then review the evidence that is available on actual and suspected impacts, and think through how it applies to the context in question, in order to reach reasonable conclusions about the actual nature of the risks in that setting.

The experience of Uganda demonstrates that many of these benefits and risks are perhaps more complicated than they seem. Price impacts are not just a function of quantities, but trader perceptions of the outside buyer and their tendency and capacity to speculate on prices. Agricultural benefits, especially for the poorest, do not come easily, and there are great challenges ahead if we aspire to engage LRP as a tool for agricultural development. Access to credit, throughout the supply chain, colors and constrains participation in markets; LRP can help resolve credit access problems, but in so doing may excessively benefit some and put others at a disadvantage. Finally, more than just price and quantity are embedded in a contract. Everything from time delays on payment, and especially quality standards, can transmit information not only to the contract holder but to the market at large. This can yield unanticipated impacts, some involving risks and others perhaps development and progress.

However, the range of impacts addressed here is by no means exhaustive. The producers' side is also quite important, in understanding the possible impacts on cropping and production decisions. There may even be environmental considerations as farmers aspire to meet certain quality standards, such as by employing improved seeds and fertilizers, without proper understanding of how to employ them. Finally it is important to understand how consumer price changes impact food buyers, and the dynamics of food sales and purchases in the country in question.

It is important to keep in mind in examining these aspects of LRP—particularly in concerning oneself with its potential risks—that food is being procured to assist food insecure populations. This is a very important, and often life-saving, goal. With any method of procurement or distribution of food aid, there will be trade-offs; there is always some degree of risk of inflicting harm. In many cases this risk may be well worth it in the interest of providing food to those in need, and the risks of other alternatives for providing that food may in fact be worse. There may also be other significant benefits, and important considerations, for recipients. The key is to understand the processes at hand so that we can optimally engage the tools we have to solve problems in development and humanitarian policy, without engendering others.

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Figures and Tables

Figure 1: Stock and Flow Diagram of Uganda maize supply chain

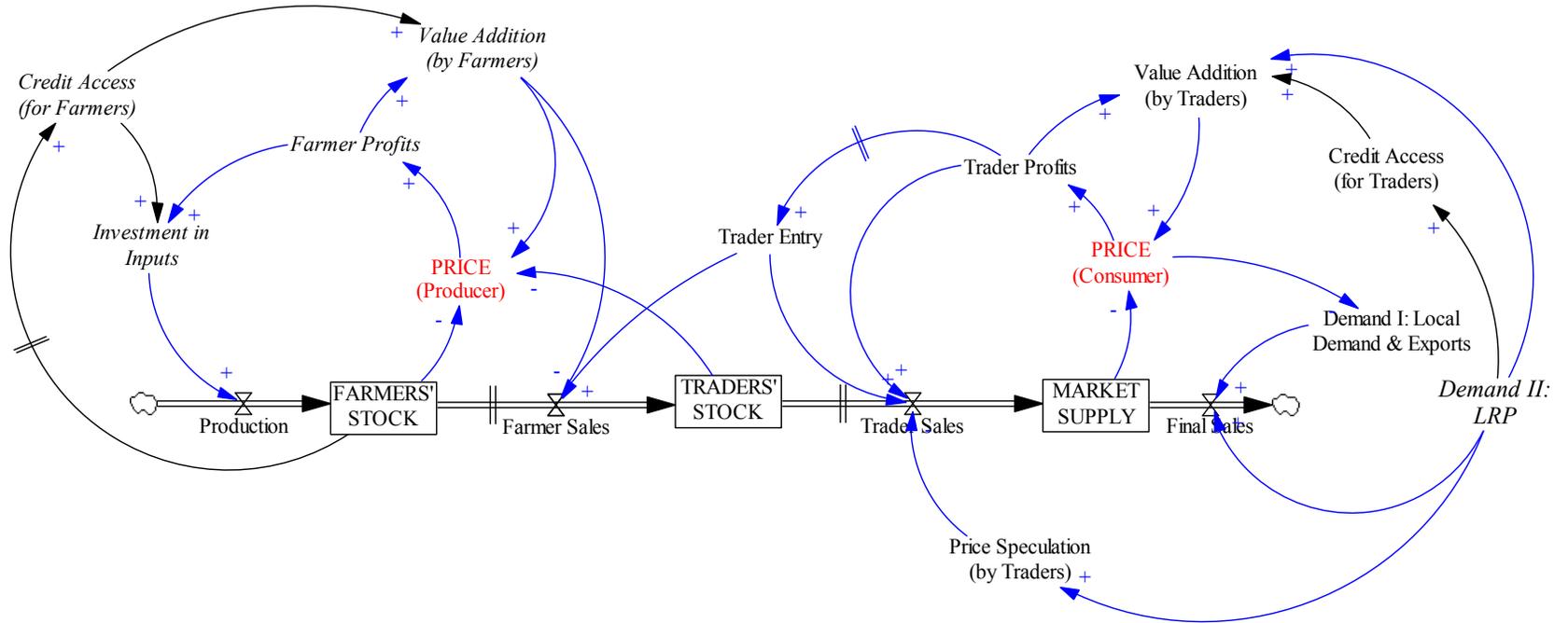
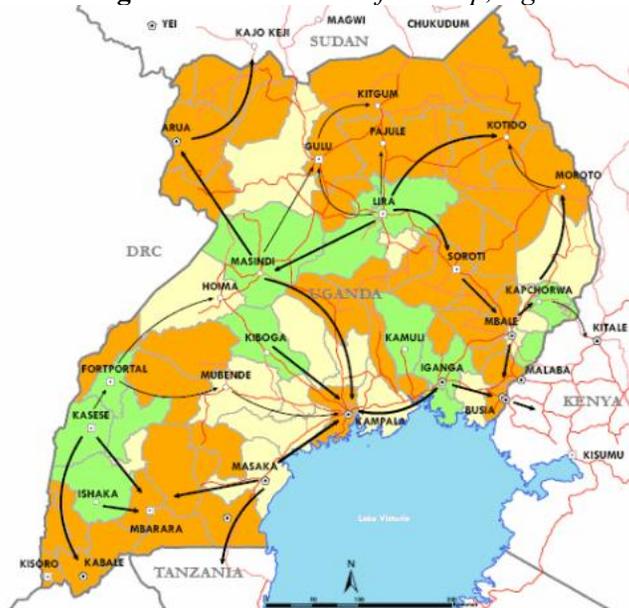


Figure 2: Maize market flow map, Uganda



Source: fews.net

Figure 3: Linking MIFIRA and the Trader Survey: Examples

MIFIRA Questions

Analytics

Indicators

1c. How much additional food can traders supply at or near current costs?

2b. Will agency purchases drive up food prices excessively in source markets?

Capacity Constraints

Storage Capacity

Credit Access

Transport Cost and Distance

Profit Margins

Factors affecting prices and profitability

Markups and Costs

Hypotheticals (supply response, desired quantities sold...)

1d. Do local traders behave competitively?

Mark-ups and Margins

Purchasing and Selling Prices

Barriers to Entry

Trader Characteristics (age, years trading, ethnicity, gender...)

Credit Access

Factors affecting supplier choice

Market Share

Volumes purchased and sold

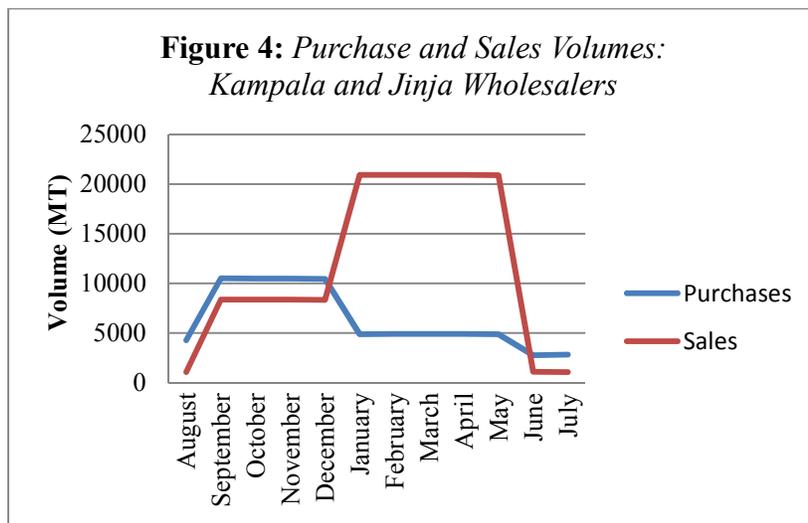


Figure 5: Smallholder Maize Supply Chain

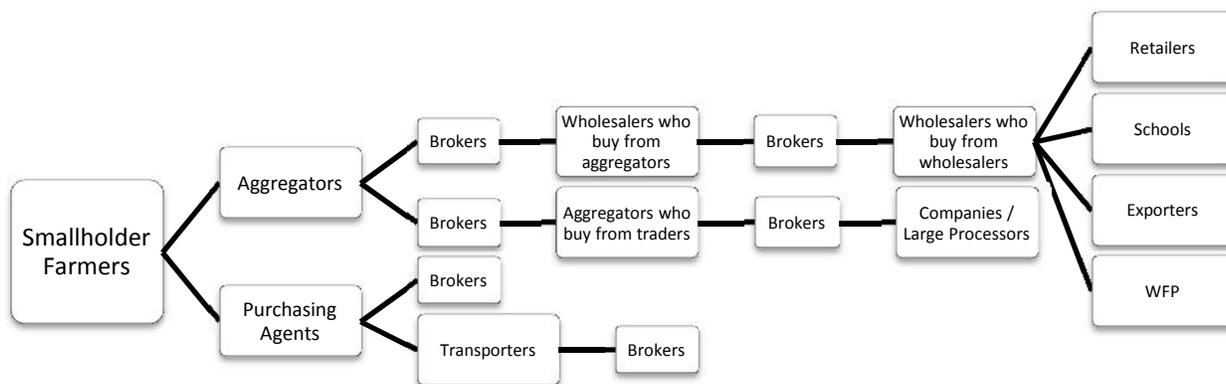


Table 1: Sample Overview

| District | Trader Type | | | Total | Percent |
|-----------|-------------|---------|-------------|-------|---------|
| | Aggregators | Brokers | Wholesalers | | |
| Dokolo | 5 | 0 | 1 | 6 | 5% |
| Iganga | 4 | 0 | 6 | 10 | 8% |
| Jinja | 4 | 8 | 12 | 24 | 20% |
| Kampala | 1 | 13 | 12 | 26 | 22% |
| Kapchurwa | 0 | 0 | 2 | 2 | 2% |
| Lira | 5 | 0 | 10 | 15 | 13% |
| Mbale | 0 | 7 | 18 | 25 | 21% |
| Soroti | 4 | 2 | 5 | 11 | 9% |
| Total | | | | 119 | |
| Percent | 19% | 25% | 55% | | 100% |

Table 2: Volumes and Prices: National vs. WFP

| YEAR | Produced* | WFP Procurement** | | WFP Price | | Wholesale Price*** | |
|------|-----------|-------------------|-----------|-----------|-------|--------------------|-------|
| | | MT | % of Prod | Mean | SD | Mean | SD |
| 2010 | 1282092 | 100383 | 7.8% | 204 | 28.6 | | |
| 2009 | 1271916 | 98761 | 7.8% | 375 | 26.46 | 642 | 118.9 |
| 2008 | 1265588 | 85521 | 6.8% | 275 | 90.7 | 439 | 95.5 |
| 2007 | 1261803 | 165905 | 13.1% | 199 | 7.86 | 305 | 90.3 |
| 2006 | 1258029 | 123052 | 9.8% | 202 | 26.8 | 302 | 63.8 |
| 2005 | 1237000 | 103923 | 8.4% | 180 | 23.87 | 253 | 93.1 |
| 2004 | 1080000 | * | * | 203 | 14.96 | | |
| 2003 | 1300000 | * | * | 176 | 11.8 | | |
| 2002 | 1217000 | * | * | 160 | 33.47 | | |
| 2001 | 1174000 | * | * | 124 | 33.07 | 257 | 98.5 |

* Source: UBOS, MAAIF, available on line at: <http://www.countrystat.org/uga/cont/pxwebquery/ma/226cpd010/en>

** Source: WFP Uganda (procured with concentrated effort on the parts of J.Upton and A. Xavier)

*** Source: WFP Price Collection in Uganda

Table 3: Access to Credit: Trader Characteristics

| | By Average Volume Sold Annually (MT) | | | | |
|---|--------------------------------------|------------------|----------------------|----------------------|---------------------|
| | Lowest (X<25) | Low (25≤X<90) | Medium (90≤X<500) | High (500≤X<1000) | Highest (1000≤X) |
| Accessed Credit (percent) | 50 | 41 | 64 | 64 | 82 |
| ...from "business fellows" | 0 | 0 | 0 | 0 | 6 |
| ...from groups / MFIs | 8 | 18 | 14 | 12 | 6 |
| ...from BANKS | 29 | 24 | 25 | 33 | 35 |
| Ease of receiving credit > 2,000,000 Ush* | 1.87 | 2.24 | 2.21 | 1.83 | 1.59 |
| Ease of receiving credit > 400,000 Ush* | 1.71 | 1.91 | 1.82 | 1.63 | 2 |
| Ease of receiving credit < 400,000 Ush* | 1.23 | 1.27 | 1.3 | 1.11 | 1.17 |
| Number of Observations | 24 | 17 | 26 | 31 | 17 |

* Rated on a scale of 1 to 4, 1 easiest and 4 most difficult

Table 4: Reported Desirable Sales Increase

| | (Percent additional relative to average daily volume in past 30 days) | | | | | |
|------------------------|---|--------------------------------------|----------------|----------------|------------------|--------------------------|
| | All Traders | By Average Volume Sold Annually (MT) | | | | |
| | | Lowest 0≤X<11 | Low 11≤X<25 | Med 25≤X<90 | High 90≤X<500 | Very High 500≤X<10000 |
| Percent More | 1488% | 263% | 178% | 379% | 50% | 10000% |
| Number of Observations | 92 | 18 | 10 | 21 | 27 | 12 |

Volume Ranges: Lowest <11; Low <25; Med <90; High <500; Serious <10000

Table 5: Labor Expansion: Trader Characteristics

| | By Average Volume Sold Annually (MT) | | | | |
|--|--------------------------------------|------------------|----------------------|---------------------|---------------------|
| | Lowest (X<25) | Low (25≤X<90) | Medium (90≤X<500) | High (500≤X1000) | Serious (1000≤X) |
| Avg. Years Trading | 9.6 | 11.8 | 13.7 | 13.6 | 11.5 |
| Women (percent) | 21 | 12 | 14 | 6 | 18 |
| Muganda or Musoga (percent) | 38 | 50 | 45 | 59 | 67 |
| Majority Ethnic Group (percent) | 50 | 76 | 32 | 51 | 41 |
| Accessed Credit (percent) | 50 | 41 | 64 | 64 | 82 |
| Trust = primary choice of supplier (percent) | 17 | 47 | 39 | 58 | 41 |
| Number of Observations | 24 | 17 | 26 | 31 | 17 |

* Rated on a scale of 1 to 4, easiest to most difficult

Table 6: Labor Costs: Wholesalers

| | By Volume Purchased Annually (MT) | | | | |
|-------------------------------|-----------------------------------|----------------|-----------------|---------------------|-------|
| | Lowest 0≤X<11 | Low 11≤X<90 | Med 90≤X<500 | High 500≤X<10000 | ALL |
| Pays Labor for Supply Trip | 27% | 0% | 17% | 36% | 20% |
| Pays Labor Monthly | 53% | 1% | 50% | 66% | 56% |
| Labor Percent of Trip Cost | 13.0% | 0.0% | 3.0% | 1.5% | 4.0% |
| Labor Percent of Monthly Cost | 13% | 15% | 16.0% | 15.0% | 15.0% |
| Number of Observations | 15 | 15 | 18 | 18 | 66 |

Table 7: Labor Costs: Aggregators

| | By Volume Purchased Annually (MT) | | | | |
|-------------------------------|-----------------------------------|----------------|-----------------|---------------------|-----|
| | Lowest 0≤X<11 | Low 11≤X<25 | Med 90≤X<500 | High 500≤X<10000 | ALL |
| Pays Labor for Supply Trip | 11% | 0% | 22% | 50% | 17% |
| Pays Labor Monthly | 22% | 33% | 67% | 50% | 43% |
| Labor Percent of Trip Cost | 2% | 0% | 0% | 11% | 1% |
| Labor Percent of Monthly Cost | 4% | 1% | 30% | 5% | 15% |
| Number of Observations | 9 | 3 | 9 | 2 | 23 |

Table 8: Labor Costs: Brokers

| | By Volume Sold Annually (MT) | | | | |
|-------------------------------|------------------------------|----------------|-----------------|---------------------|-----|
| | Lowest 0≤X<11 | Low 11≤X<90 | Med 90≤X<500 | High 500≤X<10000 | ALL |
| Pays Labor for Supply Trip | 0% | 0% | 5% | 25% | 10% |
| Pays Labor Monthly | 0% | 0% | 0% | 2% | 3% |
| Labor Percent of Trip Cost | 0% | 0% | 5% | 4% | 4% |
| Labor Percent of Monthly Cost | 0% | 0% | 0% | 5% | 2% |
| Number of Observations | 3 | 2 | 18 | 8 | 31 |

Table 9: Traders' Experience with Quality

| | By Trader Type, and Volume Sold Annually | | | | | | | | | | | |
|---------------------------------|--|-----|------|-----|-------------|-----|------|-----|---------|-----|------|-----|
| | Aggregators | | | | Wholesalers | | | | Brokers | | | |
| | Low | Med | High | ALL | Low | Med | High | ALL | Low | Med | High | ALL |
| Tests for Quality (percent) | 90 | 100 | 100 | 95 | 95 | 97 | 100 | 96 | 100 | 100 | 90 | 97 |
| Reports that quality costs more | 80 | 63 | 100 | 77 | 85 | 88 | 100 | 89 | 100 | 88 | 90 | 90 |
| Dries after purchase (percent) | 41 | 50 | 66 | 50 | 44 | 25 | 50 | 38 | 0 | 44 | 20 | 34 |
| Number of Observations | 11 | 8 | 3 | 22 | 27 | 30 | 6 | 63 | 2 | 16 | 10 | 28 |

Volume Ranges: Low <25; Med <500; High <10000

Table 10: Traders' Experience with Quality

| | By District | | | | | | |
|---------------------------------|-------------|-------|--------|-------|--------|--------|------|
| | Kampala | Jinja | Iganga | Mbale | Soroti | Dokolo | Lira |
| Tests for Quality | 93 | 95 | 100 | 100 | 100 | 83 | 100 |
| Reports that quality costs more | 93 | 95 | 78 | 91 | 82 | 50 | 86 |
| Dries after purchase | 15 | 54 | 33 | 29 | 45 | 67 | 57 |
| Number of Observations | 27 | 22 | 9 | 24 | 11 | 6 | 14 |