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QUALITY-DIFFERENTIATED PRICING AMONG AGRICULTURAL TRADERS IN UGANDA

APRIL 30, 2017

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FEED THE FUTURE UGANDA MARKET SYSTEMS MONITORING ACTIVITY

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Implemented by Feed the Future Uganda Market System Monitoring Activity (MSM), headquartered at the Massachusetts Institute of Technology (MIT) and The George Washington University (GWU).

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ABBREVIATIONS

4A	Acceptable, available, accessible, and affordable
AgInputs	Agricultural Inputs Activity
BRC Map	Behaviors-relationships-conditions map
CPM	Commodity Production and Marketing Activity
EEA	Enabling Environment for Agriculture Activity
FAQ	Fairly Average Quality
FTF-VC	Feed the Future Value Chain project of USAID/Uganda
GAP	Good agricultural practices
HESN	Higher Education Solutions Network
IFPRI	International Food Policy Research Institute
MSM	Market System Monitoring activity
QDP	Quality differentiated pricing
RAN	Makerere Resilient Africa Network Lab
SCR Map	Supply chain role map
USAID	United States Agency for International Development
VA	Village agent
VC	Value chain
WFP	World Food Programme
YLA	Youth Leadership for Agriculture Activity

EXECUTIVE SUMMARY

Background

The USAID Uganda Feed the Future Value Chain (FTF-VC) project uses a market facilitation approach to strengthen the value chains that serve smallholder farmers in Uganda. One of the goals is to improve profitability for farmers and other value chain actors by enabling improved quality and prices throughout the value chain. In a system where actors value quality and are willing to pay more for better products, farmers have the incentive to engage in practices to improve crop quality. To achieve a market for quality products, actors throughout the supply chain should offer and have access to quality-differentiated pricing (QDP). This study addresses a gap in understanding the factors that affect an actor's ability to access and incentives to extend QDP.

Goal and Approach

This case-based, exploratory research aimed **to understand the factors that enable or inhibit quality-differentiated pricing of agricultural commodities in Uganda** from the trader perspective. We interviewed six traders from Uganda's western and central regions who dealt in different commodities (beans, maize, coffee, or a combination). Traders had mixed experiences providing/accessing quality-differentiated pricing. We used qualitative analysis methods to identify themes within and across trader cases.

Key Takeaways:

- **QDP strengthens agricultural market systems by creating incentives to improve crop quality, leading to increased revenue.**
- **Interventions to improve crop quality and formalize price setting are likely to help institutionalize QDP.**
- **QDP should be further investigated in Uganda to understand its extent and drivers.**
- **Market facilitation projects should encourage reinforcing behaviors that propagate QDP throughout the value chain.**

Findings

The traders interviewed sold almost exclusively to export markets. Collectively, they identified ten challenges they face to improving quality and raising prices; most common were 'limited access to finance' and 'constrained crop volumes'. Traders did not clearly describe quality-differentiated pricing, but did have shared views of quality and pricing through which we were able to learn about QDP.

Quality

- Traders perceive that crop quality is improving.
- Traders attribute improved crop quality to the dissemination of knowledge about and the application of good agricultural and post-harvest handling practices.
- Traders understand quality to include the following attributes: moisture content, presence of foreign matter, spoilage, presence of roughage, grain size and shape, and color.

Prices

- Traders report that they are buying and selling at higher prices than in the past.
- Quality is only one aspect of pricing, and not always the most important aspect:
  - When buying, traders set prices based on exporter prices, record keeping, and crop quality.
  - When selling, traders fetch higher prices by negotiating, comparing offers, selling seeds and premium varieties, waiting for market prices to rise, and building a reputation for quality.

Quality-Differentiated Pricing

- QDP exists in the supply chain, but is not always formal.
- There were two approaches for implementing quality-differentiated pricing:
  - Price based on quality grade – actors use distinct pricing brackets for different grades determined by common perceptions of specific quality characteristics.
  - Price based on adjusted weight – certain quality attributes (e.g. moisture content, presence of foreign matter) affect the weight of a given quantity purchased; many buyers perform secondary processing

that results in weight reduction. Therefore, they may "reduce the kilograms" purchased in a transaction to account for reduced revenue potential.

- Conditions that enable QDP include: access to good quality inputs, seeds, and varieties; use of good agricultural, processing, and storage practices; disseminating knowledge of these practices; provision of spray and pruning services; access to markets; and access to finance.
- QDP requires a set of coordinated and interacting changes by multiple actors. In order for QDP to propagate, each seller must provide quality goods and each buyer must offer better prices for quality. Throughout the supply chain, sellers must have the skills, knowledge, and equipment to improve quality, while buyers must have the finances and a market to offer higher prices. To institutionalize QDP, the final buyer (the exporter, in this case) and other buyers in the chain must offer higher prices for better quality, and sellers must be aware of these better prices. In addition, the initial seller (the farmer) must provide better quality goods and other sellers in the chain must maintain that quality.
- Increasing the number of relationships among actors enables them to coordinate efforts for improving the quality of goods and institutionalizing QDP.

Overall, the results indicate that **quality-differentiated pricing can be propagated across the value chain through synergistic relationships.** When some actors offer QDP, they create incentives for other actors to improve the quality of their goods; actors who provide high-quality goods, in turn, create an incentive for buyers to offer QDP. This reinforcing loop, in which an action produces a result that enables more of the same action, is a foundational structure within systems thinking. Additionally, findings suggest that **QDP exists but is implemented informally and not yet well-established**. Quality is slowly improving through efforts to disseminate knowledge about quality improvement techniques and prices are slowly rising through improving quality and better market knowledge and relationships.

Recommendations

- Strengthen QDP through future interventions. Our results suggest that QDP is critical to improving livelihoods, but that it is implemented informally and therefore remains underdeveloped. Future interventions should aim to strengthen the reinforcing loop of actions described in this study.
- Explore QDP from the perspective of other actors. This study observed QDP solely through the lens of six traders. Studying the experiences of other traders (e.g. those who have not worked with USAID/Uganda FTF activities) and other actors (e.g. farmers, collectors, exporters, producer organizations) may lead to a revised understanding of the concepts identified here. In particular, further research should investigate whether farmers see the same changes, whether actors uninvolved in FTF-VC activities have similar perspectives, and how exporters and their business partners – some of which may be more significant actors in the market – approach quality improvement.
- Study QDP in domestic markets. Since traders primarily discussed export markets, the existence and drivers of QDP in domestic markets is unclear. Further study on the nature of QDP should be initiated through engagement with significant actors in domestic food commodity markets.
- Study correlation between knowledge of a grading system and incentive for improved quality. Evidence suggests that traders who use a formal grading system are more discerning of crop quality than those who use imprecise methods to measure and rate quality. However, this hypothesis could not be explored further with the existing interview data.

1. INTRODUCTION

The Market System Monitoring activity's (MSM) goals are to develop new approaches that assess the impact of market facilitation activities in the USAID/Uganda Feed the Future Value Chain (FTF- VC) project and to assess systemic change in markets in cooperation with the relevant partners. This effort should complement monitoring and evaluation efforts of individual activities with methods to assess how the combination of activities in the project portfolio is enabling systemic change in markets. This report describes the findings of an in-depth study of one part of the market system: quality-differentiated pricing in the agricultural outputs value chain.

1.1. Background: MSM's approach

To address the difficulty of monitoring outcomes for a portfolio of market facilitation activities, the team conducts analysis on two levels: the entire market system and subsets of components in the market system (subsystems). At the market system level, we aim to identify, understand, and analyze the relationships among the system components. Based on this understanding, we can identify key parts of the system that may be measured to assess systemic changes. At the market subsystem level, we aim to analyze key dynamics, actors, supply chains, and other interacting components to refine the indicators identified at the market system level. To do so, we will develop subsystem models, using methodologies appropriate to the unique characteristics of each subsystem and aligned with the purpose of the analysis.

Our approach is to iterate between these two levels with methodological development, data acquisition, and analysis at each level (depicted in Figure 1). For example, we would begin at the market system level of analysis by developing a conceptual map of the market system and use it to identify potential systemic change indicators. Next, we would select some of these potential indicators for further study at the subsystem level of analysis. We would identify a subsystem for which indicator(s) have been proposed, and begin to study it more deeply. To do so, we would identify data that exist or can be collected, model the subsystem, and analyze the data and models in order to formalize methodologies for measuring change in the subsystem. In this manner, we would refine the proposed indicators and develop a method for measuring them. Finally, the insights from this deeper study would be captured at the market system level of analysis, by updating the market system maps and the systemic change indicators. Further analysis at the market system level would enable identification of additional indicators and selection of additional subsystems. This iterative approach invites collaboration, learning and adaption across activities.

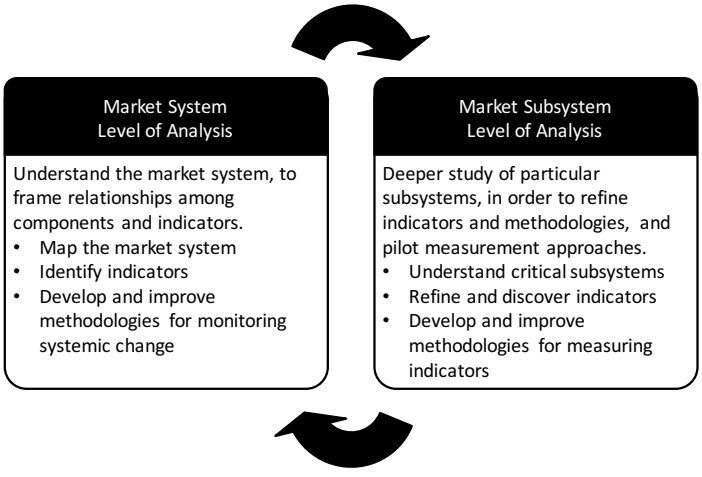

Figure 1: Levels of analysis

1.2. Goals of this report

One way small-holder farmers can improve their livelihoods is through practices that increase profits. In a system where downstream actors value quality and are willing to pay more for better products, farmers have incentive to engage in practices to improve crop quality. In order to achieve a market for quality product, it is important that actors throughout the VC offer and have access to quality-differentiated pricing (QDP). In some cases, QDP does

exist, but we do not fully understand what enables or blocks access to and willingness to extend quality-differentiated pricing. **By exploring experiences of traders, this subsystem study aims to elucidate changes in the market system that enable or inhibit value chain (VC) actor access to quality-differentiated prices**. Findings from this study will be used to improve understanding of the causal relationships in Uganda's agricultural market system and to inform USAID/Uganda's FTF-VC activities.

This study is exploratory in nature, designed to generate hypotheses and ideas for measuring systemic change. It is intended to identify system components and dynamics not previously understood. The overarching goal is to understand the nature of agricultural commodity quality and pricing in Uganda and identify indicators for measuring change in the market system.

The following research questions frame the scope of the study:

1. Quality: According to traders, has crop quality improved? How and why? Where are steps taken—and by whom—to improve crop quality?
2. Prices: Do traders buy and sell crops at higher prices than in the past? Is this change due to improved quality? What are the mechanisms by which prices change? How do traders make decisions in buying and selling?
3. Quality-Differentiated Pricing: What is the nature of quality-differentiated pricing that traders observe in the outputs subsector? What factors have enabled QDP to become an institution?
4. Challenges: What challenges must traders overcome to achieve better quality, prices, and quality-differentiated prices? How easily are these challenges overcome? How frequently are they insurmountable?

These questions were approached from the perspective of the trader. Through the USAID/Uganda Commodity Production and Marketing Activity (CPM), we are able to connect with and access data on traders from various parts of Uganda who have had varied experiences with quality and pricing in CPM's model, discussed briefly in Section 3.

The study does not aim to confirm existing hypotheses and is not solely focused on CPM interventions. It is not meant to evaluate success of market facilitation activities nor develop recommendations for traders.

2. OUTPUTS VALUE CHAIN

MSM developed two maps as part of the effort to analyze the whole supply chains for maize, corn and beans[1]. The first map is the Supply Chain Role (SCR) map. The second map, the Behaviors-relationships-conditions (BRC) map, is described more in section 7.2. The SCR is useful as an introduction as it sets a common terminology and scope of the value chain analysis. Since there are as many interpretations of a market system as there are people analyzing it, using the SCR as a reference ensures that knowledge is easily transferable and exchangeable.

The SCR map (Figure 2) brings clarity around the roles of actors in the value chain; this study focuses on the outputs side of the map. The terminology that MSM is using differs from that of other FTF-VC activities in a few ways. MSM considers any person or group of people that buy agricultural goods directly from farmers as playing the role of a collector. Other FTF-VC activities refer to collectors who buy outputs from farmers as village agents (VAs). Moving further down the value chain, a trader is a company or person that buys agricultural goods from collectors, but not farmers.

In a value chain as complex as this, there are numerous business models in which actors participate. As an example, village agents can also offer privatized, mobile extension services and provide financing or other services to farmers. These additional roles taken on by the VA are represented by the various "service providers" on the SCR map. If a VA also sells agricultural inputs to farmers, a role also undertaken by stockists and agrodealers, they assume the role of a "dealer" on the SCR map. This results in the ability to describe an actor, not just with a name

[1] https://humanitarian.mit.edu/msm-uganda-resources

that could entail various roles and business models, but by exactly the roles that they fill. For example, a VA could act as a "collector-dealer".

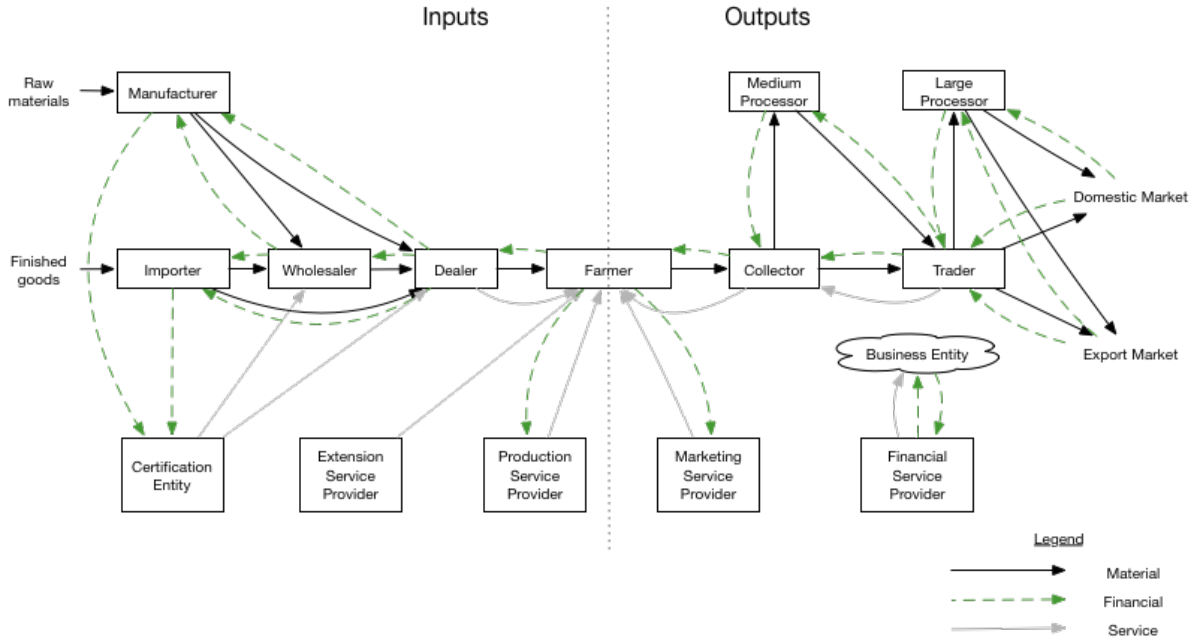

Figure 2: Supply Chain Role Map 1

3. FTF-VC INTERVENTION: COMMODITY PRODUCTION AND MARKETING (CPM) ACTIVITY

In Uganda, 85 percent of the people earn their income through farming. Farms are mostly smallholder farmers producing small amounts of produce. The FTF-VC activities all work to reduce poverty by increasing the quantity and quality of smallholder crops. One effort focused on youth in agriculture and the enabling environment for agriculture. Another focuses on strengthening the agricultural inputs subsystem. This study primarily worked with the Feed the Future Uganda Commodity Production and Marketing Activity (CPM) to gather data and explore quality-differentiated pricing in the outputs subsystem.

CPM is a five-year program (2013-2018) also using a market facilitation approach. They are working across FTF-VC target districts with middle value chain actors, such as traders, processors, and cooperatives, to increase incomes through the production of higher quality commodities in larger quantities. CPM focuses on boosting crop productivity, encouraging support services for farmers, strengthening relationships between buyers and sellers, and creating ties between traders and exporters. Their goal is to improve domestic production in such a way that they export market grows and increases farmer income.

4. RESEARCH DESIGN AND DATA COLLECTION

With little study of QDP in the Uganda market, the team took an inductive approach to generate new theory based on qualitative analysis using a multiple case study approach. We explored the experiences of several traders who were selected to represent variety in location, size, level of success in providing and accessing quality-differentiated pricing, commodity, and organizational structure. We then answered the research questions using qualitative analysis methods to interpret information from the traders and compare both within and across cases.

Research support was provided by the Feed the Future Uganda Commodity Production and Marketing Activity (CPM). CPM selected six traders that met the selection criteria regarding geography and success with quality-differentiated pricing. Table 1 summarizes notable demographics of each trader. P1 and P2 were the pilot cases

while C1-C4 were interviewed with an updated interview guide. While several traders worked with more than one commodity, the interviews tended to focus on only one. Secondary commodities are noted in parentheses.

Trader	Region	Organization	Commodity	Annual Production	Storage Capacity
P1	Central	Multiple collectors, sells domestically	Bean Seed	300-500 MT	566 MT
P2	Central	Multiple collectors	Coffee	730 MT	100 MT
C1	Central	Multiple collectors	Maize (some Coffee)	500-1000 MT maize	100 MT
C2	Central	Multiple collectors	Maize (some Beans)	700-1000 MT maize & beans	250 MT
C3	Western	Cooperative; farmers sell directly	Coffee	280 MT	unknown
C4	Western	Multiple collectors and distributors	Maize	7,200 MT	10,300 MT

Table 1: Overview of traders interviewed

An interview guide was developed to conduct semi-structured interviews with the traders. Two interviews were used as pilot studies. The interview guide was revised after reviewing transcripts and initial learnings from the pilots, and four additional interviews were held using the revised version. The pilot questions and revised interview guide can be found in Appendix A: Pilot Interview Guide and Appendix B: Revised Interview Guide respectively. The updated interview guide broke the discussion into four parts:

- Background: general information about what crops traders deal in, the numbers of farmers and village agents they work with, and who they sell to.
- Buying: learn about how traders have improved the quality of crops they are able to buy; how they set their prices and purchase crops; and how they interact with village agents and farmers.
- Selling: learn how traders access markets and provide high-quality products to achieve good market prices; learn about the challenges they face in accessing markets and good prices.
- Business practices: learn about how changes in business practices have affected quality and prices; learn about traders' goals for the future and barriers to progress.

All six interviews were included in the analysis with nomenclature to distinguish between pilot (P) interviews and case study (C) interviews: P1, P2 for interviews using the pilot guide; C1 to C4 for interviews using the updated guide.

Interviews were facilitated by CPM staff who accompanied the MSM team. The CPM staff, with knowledge of the local markets and language, helped clarify questions and answers as necessary during interviews.

In total, five MSM team members were involved in the interview process. Interviews were captured with an audio recorder and later transcribed. Field notes and short summaries were also recorded electronically. Data collection methods received approval from university Institutional Review Boards to ensure appropriate handling of human subjects information.

5. ANALYSIS METHODS

We primarily used coding and pattern matching in our case-based qualitative analyses. First, interview recordings were transcribed and the data were reviewed. Important themes were identified via a deep reading of one transcript (C2). These themes were compared to the research questions and used to construct preliminary codes. Codes are like 'tags' used to annotate and draw connections among different parts of transcripts. Coding allowed the researcher to systematically compare and contrast trader experiences. Atlas.ti was used to code the various documents and aid in analysis. The preliminary codes are listed here:

1.1 Quality perception
1.2 Quality change
1.3 Action taken to improve quality
1.4 Driver of quality change
2.1 Price perception
2.2 Price change
2.3 Action taken to improve price
2.4 Driver of price change
3.1 Price based on quality
3.2 Driver of 'QDP'
4.1 Buy
4.2 Sell
4.3 Decision-making on buy/sell
4.4 Decision making on investment
4.5 Transaction process
5.1 Goals
5.2 Challenges
5.3 Requests
5.4 Sustainability
5.5 Intervention
6.1 Relationship
6.2 Relationship change

Once a list of codes was developed, the interview transcripts were reviewed and annotated in Atlas.ti, which allowed coded text segments to be sorted and collected thematically. Subsequently, patterns were identified throughout the transcripts. Notes on main themes were recorded on worksheets and in a Microsoft Excel spreadsheet. The data tables that appear throughout this report were constructed based on careful analysis and review of transcript quotes. Each data point was cross referenced to a transcript and considered in context for relevance.

The next section attempts to show both the diversity and consensus of responses. Variation sheds light on the multitude of ways traders perceive quality-differentiated prices, while similarities indicate which experiences may be more universal.

6. RESULTS

Results are organized by the research questions stated in Section 1.2. Findings reflect the experiences of six traders who have been working with the Commodity Production and Marketing Activity (CPM). Findings are not meant to be representative of the typical Ugandan trader—or even of traders working with CPM. **This research aims to develop theories regarding enablers of quality, pricing, and quality differentiated pricing (QDP) based on a variety of trader experiences.**

6.1. Changes in Quality

Quality is multi-dimensional. While quality standards are not always employed, many traders consider similar crop attributes when evaluating quality. Table 2 briefly describes a number of quality attributes that traders frequently mentioned.

Quality Attribute	Description
Moisture content	The percentage of water in a product; generally, drier products are considered higher quality
Foreign matter	Rocks and other inedible objects reduce the quality of goods and must be removed.
Spoilage	Molds and bacteria can cause crops to spoil. In maize, aflatoxins are harmful metabolites present in spoiled crops; in coffee, Ochratoxin-A is a similar byproduct.
Roughage	Coffee and maize have hulls--roughage--around the seed and grain, respectively, that are removed during post-harvest processing. Crops with hulls intact are considered lower quality.
Size and shape	Small and/or deformed crops may be indicative of poor agricultural practices or poor growing conditions. Traders use screens of different mesh size to sort crops by size.
Color	In the case of coffee, the color of the hull indicates maturity. When coffee berries are red (cherries) they are ready for harvest.

Table 2: Common quality attributes noted by traders

Traders perceive that crop quality is improving.

The four case study traders were asked whether their crop quality has been improving; this question was not explicit in the pilot interviews. Each of the four traders who were asked [C1, C2, C3, C4] said their crop quality was improving. All six traders expressed positive perceptions of their crop quality, captured in Table 3.

Trader Perception of Crop Quality	C1 (M/C)	C2 (M/B)	C3 (C)	C4 (M)	P1 (B)	P2 (C)
They are happy with the current quality of the crops they buy	×	×	×			
Crop quality has been improving	×	×	×	×		
They are selective about the quality of crops they buy		×		×		×
They reference a grading/classification system in buying and selling				×	×	×

Table 3: Traders' perceptions of crop quality

Upon being asked, C1, C2, and C3 said that they were happy with their crop quality. While C4, P1, and P2 were not explicitly asked the same question, they did imply that they buy and sell what they consider to be good quality products. These three traders were also more precise in defining a system for classification or grading. C4 identified five grades of maize, and P1 noted three different grades of beans. In the case of coffee, P2 distinguished between *kiboko* and *Fairly Average Quality (FAQ)*, the former of which is dry, unprocessed coffee cherries and the latter is hulled. All three said that different grades or classes fetch different prices.

Traders attribute improved crop quality to using good agricultural practices (GAP) and good post-harvest handling (PHH) practices.

Table 4 lists agricultural practices that traders are encouraging farmers to use. Traders also mentioned processing and preservation practices that are important for improving or maintaining quality, listed in Table 5.

All traders acknowledge the value of having high quality inputs, and three [C1, C2, C4] related the benefits of using good quality inputs to the benefits of using good quality seeds, discussing them in similar ways. As a seed dealer, P1 had a different view on the use of good seeds, emphasizing their importance in more depth. C3 and P2 work in coffee, a woody perennial crop for which the quality of the seed used is less important than the practices used to germinate and care for the plants. By extension, since coffee is a tree, it is not unexpected that C3 was the only trader who acknowledged the value of pruning and identified it as most important for improving crop quality.

Good Agricultural Practices	C1 (M/C)	C2 (M/B)	C3 (C)	C4 (M)	P1 (B)	P2 (C)
Use good inputs	×	×	×	×	×	×
Use good seeds	×	×		×	×	
Harvesting ripe products	×	×			×	×
Pruning			×			
Spraying		×	×	×		

Table 4: Good Agricultural Practices (GAP) that traders attribute to improved quality

P1 deals in beans, both 'grain' and 'seed.' P1 acknowledged the importance of producing good quality seed for buyers and also discussed how different varieties have different value. Similarly, P1 explained that certain varieties were more valuable since they have higher yields. Here, quality and volume were not conflated, but P1 did imply that quality and yield are dependent on overlapping sets of factors.

It should be noted that Table 4 considers *spraying* separately from the *use of good inputs*—despite potential redundancy—for three reasons. First, spraying was a specific application of inputs singled out by half of the traders interviewed. Second, the activity of spraying is distinct from using good quality spray; one could spray using good quality or poor quality chemicals. Third, spraying can be done by multiple actors and requires special equipment, as opposed to fertilizer or other agrochemicals that are mixed into the soil and primarily used by farmers. Village Agents sometimes offer spraying services, or spray equipment is purchased communally.

Table 5 similarly compares the processing and preservation practices that traders use and promote to improve quality. Good processing and preservation practices are distinct from good agricultural practices: agricultural practices are explicitly employed by farmers to produce crops, while post-harvest processing and preservation practices can be used by any actor in the value chain to improve quality.

Processing and Preservation Practices	C1 (M/C)	C2 (M/B)	C3 (C)	C4 (M)	P1 (B)	P2 (C)
Sorting (size, shape, foreign material)			×	×	×	×
Hulling	×		×	×		×
Drying	×	×	×	×		×
Fumigation				×	×	
Post-harvest storage	×	×		×	×	×

Table 5: Processing and preservation practices that traders attribute to improved quality

Sorting and drying do not require (but can be expedited with) machinery and can easily be accomplished by any actor. Both drying and sorting contribute to the perceived quality: dry products are less perishable; contaminants should not be consumed. Drying and sorting apply to all three commodities. On the other hand, fumigation is not usually used to process coffee and hulling is less intensive for beans. Fumigation was only mentioned by one maize trader and one bean trader and not across the board.

The most frequently mentioned post-harvest practices were drying and the use of adequate post-harvest storage facilities, which prevent spoilage from molds and insects. In particular, emphasis was placed on the use of tarps for drying to prevent contamination and achieve lower moisture content.

For maize, different levels of hulling help determine different quality grades. In Uganda, according to C4, less roughage is considered higher quality. Hulling is particularly important for coffee quality. There are two methods of hulling, dry and wet. Typically, Arabica coffee is hulled wet—before the beans are dried—while Robusta is hulled by mechanically shaking off the shells after drying.

Traders attribute improved crop quality to training and knowledge dissemination.

Table 6 shows four of the modes by which traders access and disseminate knowledge about improving the good practices mentioned above.

Modes of Knowledge Transfer	C1 (M/C)	C2 (M/B)	C3 (C)	C4 (M)	P1 (B)	P2 (C)
Trainings from CPM or other organizations	×	×	×	×	×	×
VAs train farmers	×	×	×	×	×	×
Demonstrations	×	×	×		×	
Communication technology		×			×	

Table 6: Modes of knowledge transfer identified by traders

Training, not unexpectedly, was identified by all traders as a key mode of knowledge transfer. Several traders requested more trainings, asking if we could provide resources for further learning on ways to improve crop quality and yield. More interesting are the nuances surrounding the ways traders explained knowledge transfer between their village agents and farmers. For C3, for example, village agents primarily act as extension and service providers. They sell pruning and spraying services to farmers and help them know when the right times are to harvest. Unlike C4, whose village agents additionally buy crops from farmers to sell to C4 and also have outlet stores for selling posho (milled corn) and inputs, C3's village agents are not involved in transactions with farmers. Village agents play many roles, many of which include aspects of knowledge transfer touched on in these interviews. Among them:

- Extension providers – teach farmers good agricultural practices; advise on planting and harvest timing; advise on treating crop illnesses
- Service providers – spraying and pruning services were primarily identified
- Collectors – either collect and transport or buy and sell crops from farmers to traders
- Dealers – sell agro-inputs; alternatively, may act as a liaison between farmers and dealers

Four of the traders mentioned demonstrations as valuable ways of transferring knowledge. Across the four traders, we heard about different ways to conduct demonstrations. Some talked about the value of demos for sharing ideas and learning techniques among farmers, while others focused on the persuasive nature of seeing improvements in crops. Some traders discussed "field days" where farmers come together to practice techniques, share ideas, and show their wares. Other times, farmers work with village agents to set up 'demo plots' where techniques are tested. After a season, farmers can see the difference that improved agricultural practices have on yield and crop quality.

Telecommunications technology has provided an important platform for sharing information among exporters, traders, collectors, and farmers. C2 and P1 were the only two traders who discussed the use of cell phones and the internet, but CPM has been promoting and subsidizing smart phones to help all actors better access extension services and data on current prices. Phones help strengthen relationships among farmers and village agents, village agents and traders, traders and exporters. Improved communication allows actors to make better-informed production and business decisions.

6.2. Changes in Pricing

Traders report that they buy and sell at higher prices than in the past.

Three traders [C1, C2, C3] directly indicated that prices have changed, that they fetch better prices for their crops than in the past. Table 7 is included for visual continuity. It should be noted that only these three traders were explicitly asked whether their prices have changed over time; the question was articulated when the interview guide was modified between the pilot and case interviews, and the question was overlooked in the C4 interview, which was pressed for time.

Price Perception	C1 (M/C)	C2 (M/B)	C3 (C)	C4 (M)	P1 (B)	P2 (C)
Prices have improved because of quality change	x	x	x			

Table 7: Trader perception of prices at which they buy and sell crops

All three traders said that they have indeed seen price changes, and they attributed those changes to improvements in crop quality.

- C1 briefly mentioned that prices have changed in recent years and that quality and quantity have also changed.
- C2 talked about changes in quality over the past three years, explaining that the price they sold maize increased from 250-500 to over 800 UGX/kg. In a different part of the interview, C2 explained that the change in quality allowed them to access more markets—new exporters began buying their crops and were willing to pay more for them.
- C3 echoed that "the general increase in quality has led to an increase in price." Interestingly, C3 implied that he perceived this change happening at a national level.

While the evidence suggests that prices have changed for these traders, it is not sufficient to conclude that changes in quality are the singular cause of price changes. While traders did not identify other reasons that 'prices have changed,' they did comment on the criteria that *they use* to set prices and on actions they take to fetch higher prices, both of which are described further below.

When buying, traders set prices based on exporter prices, record keeping, and quality.

Distinct from whether or not traders buy and sell at higher prices, Table 8 shows the three main factors that traders claim they consider when setting prices.

Factors Traders Consider When Setting Prices	C1 (M/C)	C2 (M/B)	C3 (C)	C4 (M)	P1 (B)	P2 (C)
Exporter Prices	x	x	x	x		x
Business Records	x	x		x	x	
Quality	x	x	x	x		x

Table 8: Factors traders consider when setting prices

Export prices drive the market. It was clear from interviews that these traders work primarily with exporters and rely on competition among exporters to fetch good prices. Few traders discussed domestic markets, which may indicate that domestic markets are not as stable or reliable as export markets. Two traders also said that they would like to become exporters themselves, seeing that as a path forward for earning higher incomes.

Most traders kept records of goods purchased and sold and used those records to make business decisions. C1 astutely stated that they use records to track the quantities of goods they buy and sell and the profits of their transactions because, "If the business does not bring a profit…it is not a business." C2 decides what to pay farmers by deducting their transportation costs and profit from the revenue they project based on export prices. Some traders, like C4, indicated that they learned the importance of improved record keeping through CPM. It is worth noting that P2 did not discuss record keeping during the interview, but neither claimed nor denied whether they do.

C3 mentioned record keeping and using records to make business decisions, but did not directly tie this to setting prices. Rather, C3 is a cooperative that uses records to see when they have surplus income that they can invest in machinery and other physical capital to improve services for members.

Finally, all traders except for P1 indicated that they set prices based on quality. The mechanisms of this process are described in more detail in Section 6.3 on Quality-Differentiated Pricing. P1, as a dealer of bean seed, discussed the relationship between quality and yield in the context of improved varieties and multiplication of seed.

When selling, traders fetch higher prices by negotiating, comparing offers, selling seeds and premium varieties, waiting for market prices to rise, and building a reputation for quality.

Before discussing the specific actions that traders identified for fetching higher prices, it is important to mention that some traders did not clearly distinguish between price and revenue. That is, when asked what they do to

fetch higher prices, some answers were framed as what traders do to make more money. While increased crop prices lead to traders generating higher revenue, many actions to increase revenue do not necessarily include fetching higher prices for the same goods. While the distinction was not always clear, the results here aim to reflect actions taken to obtain higher prices per goods sold, rather than overall revenue. Table 9 summarizes these categories of actions traders take.

Actions Taken to Fetch Higher Prices	C1 (M/C)	C2 (M/B)	C3 (C)	C4 (M)	P1 (B)	P2 (C)
Negotiating	x	x	x			
Selling to highest offer (access to markets)	x	x		x	x	
Store crops when prices are low, sell when high	x					x
Exporting directly		x	x	x	x	
Selling seed and premium varieties	x		x		x	
Advertising		x		x	x	

Table 9: Action traders take to fetch higher prices

Most of the traders either negotiate with exporters, select where to sell based on prices advertised, or both. In selling to the highest offer, traders emphasized the importance of having access to a number of exporters. When they are connected to more exporters, they have more options and can see who is offering the highest price. Most traders either call ahead to see what prices are offered on a given day or they access the prices over the internet. Once they know the prices offered at each location, they can use those prices to negotiate higher prices at a preferred exporter. Traders may prefer one exporter over another because of proximity. Length or reliability of relationship can also motivate traders to prefer one exporter over another for reasons other than price offered.

Negotiating and selecting the market to sell to, collectively mentioned by five of the traders, are essential mechanisms for determining the value of goods. These two methods for fetching higher prices can be thought of as types of auctions where exporters bid on the goods traders are auctioning. In each transaction where negotiating takes place or traders choose one exporter over another, the parties are mutually agreeing on the value of the goods.

Market price fluctuations (described in Section 6.3 as a challenge traders face) increase the importance of having adequate storage facilities that prevent crops from spoiling. When market prices are low, traders prefer to store their crops until prices rise again. Without appropriate post-harvest storage facilities, crops are susceptible to mold and insect damage. If traders store crops until the main harvest has passed—that is, until those who lack storage facilities have sold their produce—they can fetch higher prices when prices rise again in the off season. Additionally, P2 explained that weather can have an effect on prices: when there is rain, coffee, for example, does not dry as well. If P2 has silos to keep coffee dry, they can sell at a higher price after the rain. Therefore, storage facilities can help traders fetch higher prices when they strategize based on reasonably predictable market price fluctuations.

When traders have access directly to export markets, they say they are able to fetch higher prices than selling domestically. Only C4 mentioned that they sell to domestic markets, and even then, they were selling and aiming to sell to specialty buyers (e.g., schools, refugee camps). The four traders who identified exporting directly as a way to increase prices indicated that, while becoming an exporter requires physical and financial capital, they dream of exporting directly to reach new markets that offer higher prices.

In terms of the value of goods, only P1 directly discussed the value of certain varieties in detail, but the importance of variety was backed up through discussions with CPM members and was mentioned by C1 and C3. For producers who grow seed stock, P1 said, certain varieties fetch higher prices. Similarly, some varieties have higher yields or are genetically engineered to grow under difficult conditions. Better seeds are associated with larger yields, larger yields bring in more income overall. Thus, for some, high yield is considered a 'good' quality attribute.

As discussed in the previous section, use of good business practices came up several times in the discussions on price setting. All traders except P2 mentioned keeping records of quantities bought and sold and using that information to make business decisions. In terms of fetching higher prices, P1 also advertises and has a team that works on marketing strategy. C2 and C4 alluded to the importance of reputation, explaining that buyers know their company name and know that their products are high quality. Reputation and advertising help build trust among buyers and sellers, creating positive feedback that facilitates quality differentiated pricing.

Traders' explanations of their actions taken to improve prices indicate that the upward trend in pricing identified in the first part of this section is inconsistent and heavily dependent on factors that traders perceive as external. Almost all of these actions (with the exception of selling premium seeds or varieties) depend on exporters being willing to pay more for higher quality or trusting the exporter enough to pay a higher price. It is interesting that traders did *not* say "I improved my quality in order to fetch higher prices" but *did* correlate the improvement in quality with increased prices. Causality was implied, though not explicit.

6.3. Quality-Differentiated Pricing

It is difficult to determine the catalyst for QDP, and thus challenging to identify where to initiate interventions. Buyers are only willing to pay more when better quality goods are available, but sellers only have the incentive to produce better quality goods when they know the extra effort will be rewarded. This type of dynamic is a "reinforcing loop" in which an action produces a result that enables more of the same action, and on and on. This results in something of a paradox: better quality goods must be available for a buyer to pay more for them, but better quality goods will only be produced *if* a buyer is willing to pay more for them. Initiating this reinforcing loop requires both changes to happen together.

Two approaches for quality-differentiated pricing are prices based on quality grade and prices based on adjusted weight.

In one way or another, all traders agreed that higher quality crops fetch higher prices than lower quality crops. However, as implied by Table 10 price setting is complicated, multifaceted, and done in different ways, even when based on quality.

Evidence of Quality-Differentiated Pricing	C1 (M/C)	C2 (M/B)	C3 (C)	C4 (M)	P1 (B)	P2 (C)
Higher quality fetches a higher price	x	x	x	x		x
"We do not buy bad quality"		x		x		
Reduced kilograms for lower quality	x		x			
Price by grade or level of processing				x	x	x

Table 10: Evidence that traders offer and obtain quality-differentiated pricing

Among these traders, there are two distinct approaches to QDP:

1) Price based on quality grade – actors use distinct pricing brackets for different grades determined by common perceptions of specific quality characteristics.
2) Price based on adjusted weight – certain quality attributes (e.g. moisture content, presence of foreign matter) affect the weight of a given quantity purchased; many buyers perform secondary processing that results in weight reduction. Therefore, they may "reduce the kilograms" purchased in a transaction to account for reduced revenue potential.

Grading is clearly employed by C4 and P1 and to some extent by P2. C4 listed five grades of posho (corn flour) and explained that they differ based on the level of processing. P1 explained that there are three grades of beans. Both traders also said that different grades fetch different prices. P2 was less clear about a grading system, but noted that hulled coffee (known as FAQ, Fairly Average Quality) is bought and sold at a higher price than un-hulled coffee (kiboko). Again, quality is added through processing and higher prices are paid for higher levels of processing.

Traders that do not distinguish quality grades typically employ a method known as *reducing the kilograms*. Basically, they publicize a nominal price for 'good' quality and pay for fewer kilograms than the scale measures when the quality is substandard, though the process for ascertaining quality is not standardized and the adjustment may be arbitrary. Traders explained that they use this method to account for mass lost after processing and described three ways that happens. First, one of the hallmarks of poor quality that warrants reducing the kilograms is the presence of foreign objects (e.g. stones). Traders will sort the products again to remove these contaminants, physically reducing the weight of the goods. While C4 does not claim to use the "reducing the kilograms" method, they explained that up to 10% of the weight of poorly-sorted maize may be comprised of stones and other foreign matter. Second, a similar situation occurs when crops are not thoroughly dried. Traders will dry the crops again, and as water is removed, the crops weigh less. So, some traders will reduce the kilograms to account for the extra weight of water. In C3's case, a machine sorts dry coffee from the un-dry and C3 purchases the dry coffee only. The third scenario in which this makes sense is when crops are not hulled—hulling removes weight.

Enablers and barriers to QDP

As seen in Table 11, traders identified a wide variety of challenges. In the interviews, it was difficult to specify and tease out the differences among challenges to improving quality, challenges to fetching higher prices, and challenges to QDP. From the trader perspective, they are all interconnected. Additionally, traders sometimes discussed the challenges farmers, village agents, and exporters face as distinct from their own; sometimes challenges were discussed broadly. Each trader had a unique story to tell on how these challenges were presented. Some are challenges that the trader has overcome. Some were framed as requests. In understanding the challenges and enablers of quality differentiated pricing, it is essential that challenges are approached with the knowledge that they affect people in ways as varied and multitudinous as personalities.

Challenges	C1 (M/C)	C2 (M/B)	C3 (C)	C4 (M)	P1 (B)	P2 (C)
Farmers adopt practices slowly	x	x	x		x	
Telecommunications		x			x	
Communication/transportation [infrastructure]	x	x			x	
Access to markets		x	x	x	x	
Yields/volume of produce	x	x	x	x	x	
Lack of storage facilities	x			x	x	x
Counterfeit inputs	x	x	x			
Finance	x	x	x	x	x	
Climate change/weather			x		x	x
Price fluctuations	x		x	x	x	

Table 11: Challenges that value chain actors face as identified by traders

Farmer adoption of good agricultural and processing practices was an issue identified by most of the traders. When asked why this was the case, traders gave different answers. C3 explained that it is 'human nature' to resist change. He says that farmers feel they do not have time to employ new practices, that they are inconvenient, and that they are satisfied with their current harvests. As explained in Section 6.1, demonstrations have been effective in encouraging farmers to adopt more quickly. Yet, despite demonstrations, trainings, and testaments, traders can expect that adoption will remain an obstacle to be overcome with each farmer.

Communication and transportation, combined here, include difficulties that traders face in receiving and distributing price information among farmers, and challenges that village agents face in traveling to farmers to teach and guide them. Poor roads and lack of vehicles were mentioned by C1, C2, and P1. Village agents, they say, have difficulty keeping in touch with farmers and monitoring their progress. Village agents help farmers know when the right time to harvest is, for example, and mostly travel by foot or bicycle. As C2 says, even if they all had

motorcycles, it would make a big difference. Many traders, village agents, and farmers also rely on cellular telecommunications, which as C2 and P2 point out, is sometimes out of service.

The importance of **access to export markets, lack of storage facilities**, and price fluctuations are discussed previously in the context of actions traders take to fetch higher prices. C2 and C3 particularly emphasized that limited access to export markets is one of the greatest challenges they face and a main limitation to growth. While price fluctuations were frequently identified as a difficulty, P1 made a call for government intervention and price fixing.

Almost all the traders, at one point or another, commented that their businesses are limited by the current **yields and volumes** of crops they trade. This sentiment was sometimes framed as a request for further trainings that would help them increase yields. Sometimes, as in the case of C2 and C4, it was a lament that volume is preventing them from becoming exporters themselves. Either way, it was clear that quantity is a significant obstacle in the minds of the traders, though this is tangentially related to the use of quality differentiated pricing.

Several traders mentioned that **counterfeit inputs** are still a problem that their farmers face. Distinct from the emphasis on using quality inputs that farmers cited as a good agricultural practice improving quality, the presence of counterfeit inputs was also identified as a challenge to be overcome. With the introduction of the Agricultural Inputs Activity's e-verification system, some of the issues with counterfeit inputs are being addressed.

Access to finance is a challenge that comes in many flavors. Traders may take out commercial loans or make use of payment plans when purchasing processing equipment, silos, or trucks, for example (mentioned by C2 and C4). C3 discussed how other traders take out loans to pay farmers advances, enabling them to purchase inputs. C3 explained that this is a risky move since harvests are not always as expected and farmers could sell to other traders instead. Looking at finance from a different angle, C4 discussed how their village agents are better able to access loans since they are affiliated with C4 and are considered part of an association. Village agents and cooperatives are sometimes able to purchase equipment like sprayers via cost sharing (C3). Farmers have opportunities to purchase tractors through similar payment plan programs (C4). Consistent access to financial services would allow both farmers and traders to engage in practices that improve crop quality.

Finally, traders commented on the impacts of **climate change and weather**. Weather, more simply, impacts day to day operations. It is more difficult to dry crops thoroughly when it rains, for example. However, climate change is affecting seasonal patterns and harvest times. Crops must be sown at particular times; if too early or too late, harvests are sub-optimal. The timing is becoming unpredictable as a result of climate change.

Traders identified various QDP enabling conditions that are established or developing:

- access to good inputs, seeds, and varieties
- use of good agricultural practices
- use of good processing and storage practices
- promulgation of knowledge through trainings and demonstrations
- provision of services (spraying, pruning)
- improved communication and transportation infrastructure
- access to numerous markets (competition)
- negotiation for, advertising for, and reliably providing quality to achieve higher prices
- use of transaction records to make business decisions
- ownership of assets for processing and storage
- access to finance to grow a business and take risks

Though this list may not be comprehensive, fortifying these institutions will help create the environment conducive to provision of QDP. CPM's interventions have been addressing many of these issues, and our results suggest they have met with some success, though its extent remains to be determined. From our data, it is hard to see the

perspectives of village agents, farmers, and exporters, but we can extrapolate the findings to predict their points of view.

7. DISCUSSION

One key finding is that quality-differentiated pricing (QDP) can be propagated in the value chain through synergistic relationships. When some actors offer QDP, they create incentives for other actors to improve the quality of their goods; actors who provide high-quality goods, in turn, create an incentive for buyers to offer QDP. This reinforcing loop, in which an action produces a result that enables more of the same action, is a foundational structure within systems thinking. A second key finding is that QDP exists but is implemented informally and not yet well-established. Quality is slowly improving through efforts to disseminate knowledge about quality improvement techniques and prices are slowly rising through improving quality and better market knowledge and relationships.

7.1. The Nature of QDP

The relationship between quality and price—and quantity—is complex. Traders emphasized the importance of quality at just about every point of production; however, they also implied that quality, quantity, and price are three dimensions of goods sold that are distinct, yet interdependent. For example, price is a function of both quality and quantity. One reason buyers are willing to pay more for better quality is because several quality attributes are dependent on the removal of physical substances (water, stones, husks), and so **buyers are paying for *more quantity* when they pay more for higher quality**.

Quality and quantity are inherently related, and sometimes conflated, by actors in the commodity distribution supply chain. For example, traders frequently linked the use of quality inputs to increased yields. When traders have more goods to sell, they make more money. Similarly, the use of good quality inputs protects crops from insect damage and produces large grains, both traits of quality that can help traders fetch higher prices. It becomes easy to make fallacious assumptions that the use of good quality inputs leads to higher incomes only because use of good inputs leads to *higher yields*, and thus, higher incomes; it is similarly true that the use of good inputs leads to *better quality* crops, which fetch higher prices when QDP is offered. The use of good inputs leads to both higher yields *and* better quality crops, *both* of which are dimensions that fetch better prices.

A similar story can be told with respect to pruning, sowing and harvesting seeds at appropriate times, and other good agricultural practices. These actions enable large harvests (quantity) while improving quality characteristics of crops (size, shape, color). While traders loosely acknowledged that quantity and quality are both dependent on use of good practices, and that prices are set based on both dimensions, they did not differentiate or explain price setting in this more nuanced way. It is unclear, for example, the extent to which price varies with quantity – whether this occurs solely in the context of "reducing the kilograms", or whether some traders also offer higher prices for bulk quantities of crops.

7.2. QDP in the Behaviors-Relationships-Conditions (BRC) Framework

The reinforcing loop for quality differentiated pricing can be depicted in the style of the Market Systems Monitoring (MSM) Activity's Behaviors-Relationships-Conditions (BRC) map. The BRC map depicts key concepts in market systems, including behavior changes by actors, relationship changes among actors, and enabling conditions.

The framework behind the BRC map is depicted in Figure 3. It is based on a "theory of change" for the facilitative market interventions carried out by Feed the Future Activities. These interventions enable the existence of conditions within the market system that further enable behavior changes by and relationships among market actors. When behavior and relationship changes occur together at some scale, system level results are affected, generating project impact. The BRC map framework connects key concepts to each other by showing which behaviors, relationships, and conditions enable other behaviors, relationships, and conditions, without claiming causality. In other words, an arrow from A to B indicates that A enables B, even if A may not cause B. Some

arrows are bi-directional; the enabling can occur in either direction. Feedback arrows in Figure 3 demonstrate that system level results can enable relationship and behavior changes, as well as changes to conditions. The feedback arrows also demonstrate that relationships and behavior changes can enable conditions.

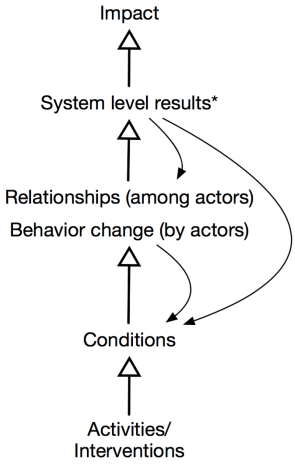

Figure 3: BRC map framework

Figure 4: demonstrates how this framework is translated into a BRC map. Magenta circles represent relationships, blue squares represent behavior changes, items in black letters with no outline are enabling conditions, and green ovals represent interventions by activities. The arrows indicate which map element enables another. In this case, an intervention enables two conditions, each of which enables a behavior change. A relationship between actors enables a behavior change of one actor to affect the behavior of the other.

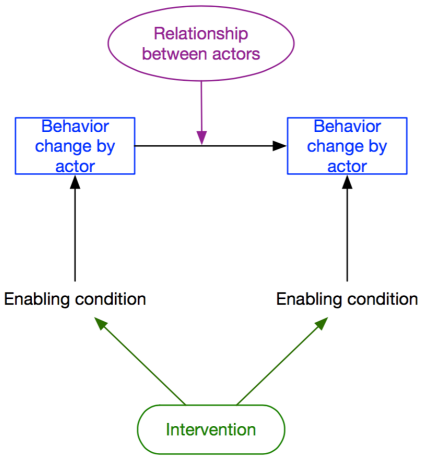

Figure 4: Translating BRC framework into a map

In Figure 5, the behaviors, relationships, and conditions involved in the QDP "reinforcing loop" are represented using the BRC system mapping approach. In general, QDP is offered by a *Buyer* (an Exporter, Trader, or Collector) and quality goods are provided by *Sellers* (Traders, Collectors, and Farmers, respectively). This *Buyer-Seller* relationship is used in Figure 5 as a placeholder to represent the other dyad relationships (Exporter-Trader, Trader-Collector, and Collector-Farmer). Figure 5 portrays the QDP loop in generic *Buyer-Seller* terminology, where the behavior changes and enabling conditions relating to *Buyers* are surrounded by green background, and those relating to *Sellers* are surrounded by orange. As described above, this is a positive feedback cycle – the arrows from behaviors to conditions form a continuous loop. Once initiated, the cycle is self-reinforcing.

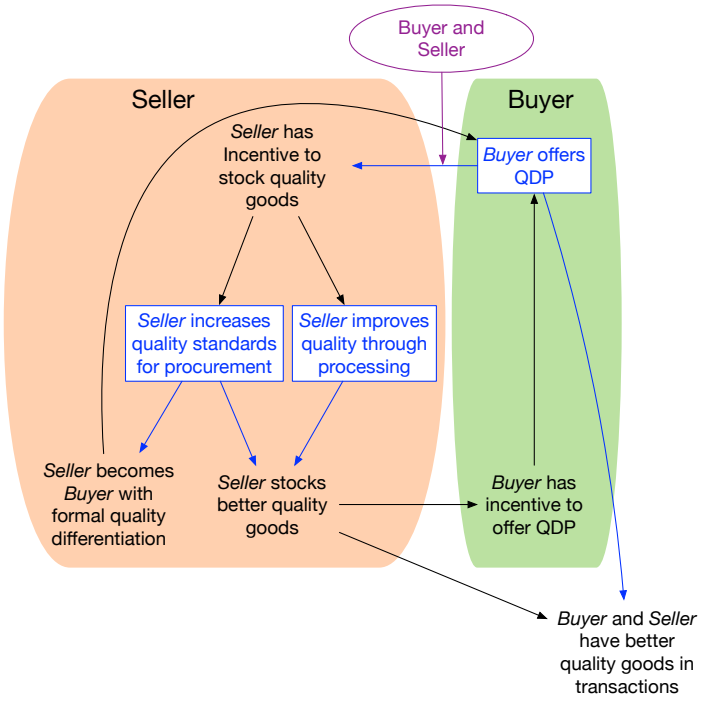

Figure 5: QDP loop depicted with Buyer and Seller placeholders

When interpreting the QDP loop, a logical place to begin is with the behavior change "*Buyer* offers QDP." When a *Buyer* offers QDP, they create an incentive (a condition) for a *Seller* to stock quality goods. This condition enables two behavior changes a *Seller* can make to improve the quality of goods they stock. First, they can increase their quality standards for what they purchase: they can purchase better quality goods. Second, a *Seller* can process goods to improve quality. For example, milling, hulling, and drying are three ways middle value chain actors can increase the quality of the goods they sell; farmers can use good agricultural practices and buy quality inputs to produce better quality crops. As a result of procuring higher quality goods and processing goods to improve quality, *Sellers* have better quality goods in stock. "*Sellers* stocking quality goods" is a behavior that can take place regardless of whether or not *Buyers* offer QDP, but one way to enable this behavior is through making QDP available.

When *Sellers* have better quality goods in stock, *Buyers* have incentive to offer QDP, and the cycle continues. The incentives for *Buyers* and *Sellers* to respectively offer QDP and stock quality goods are the factors that drive the reinforcing loop and are enabled by each actor taking the initiative to stock quality goods and offer QDP respectively.

There is another nuance here: a single actor typically plays the role of both the Seller and Buyer. A trader, for example, is a Buyer with respect to collectors and a Seller with respect to exporters. We have attempted to capture this complexity with the behavior "Seller becomes Buyer with formal quality differentiation."

To fully map the pathways that enable QDP in the market system, the BRC map must also include the processes that determine the quality and quantity of produce. In Figure 6, quality, quantity, and price settling are represented in the BRC map as three parallel subsystems that all enable increased profit for the *Seller*.

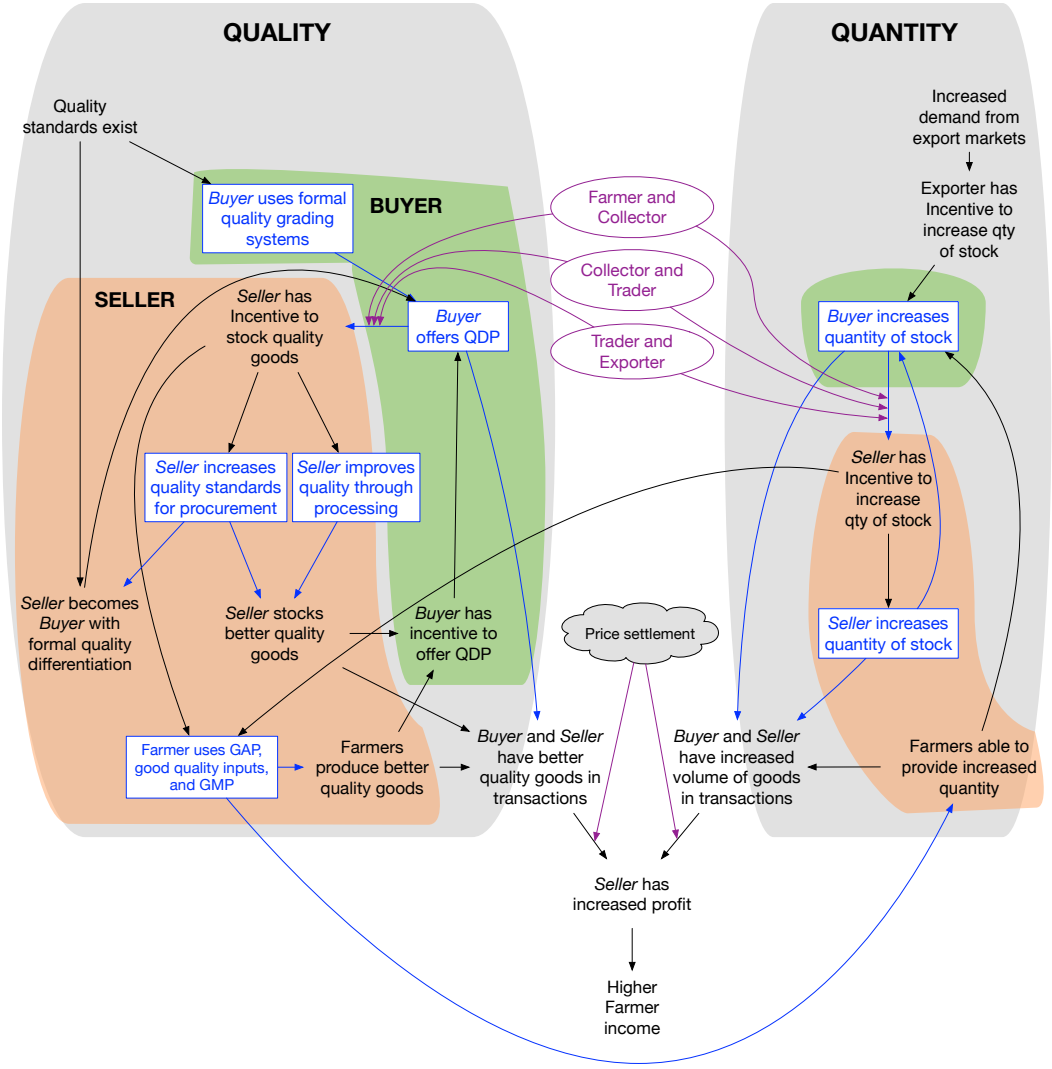

Figure 6: Quantity and Quality in the outputs subsystem

Depicting quality, quantity, and price setting separately, it becomes clear that there are behavior changes that affect quality and quantity independently, but that increased quantity and increased quality both lead to higher profits. Price settling is complex, and while prices are impacted by both quantity and quality, data from this study shows that negotiations, reputation, and competition are relevant. The prices for quality differentiated products are also influenced by prevailing international market prices, particularly when there are exporters in the value chain. Discerning the economic and psychological drivers behind price settling is outside the scope of this study, but presents opportunities for future work.

In Figure 6, the dyad relationships (Exporter-Trader, Trader-Collector, and Collector-Farmer) are summarized with the token *Buyer-Seller* terminology except where Exporters and Farmers act differently from the other middle value chain actors. Figure 7 further expands the BRC map to show how the *Buyer-Seller* dyads cascade, how each

tier relies on QDP being offered by sellers of the higher tier, and higher quality goods being provided by actors in the lower tier.

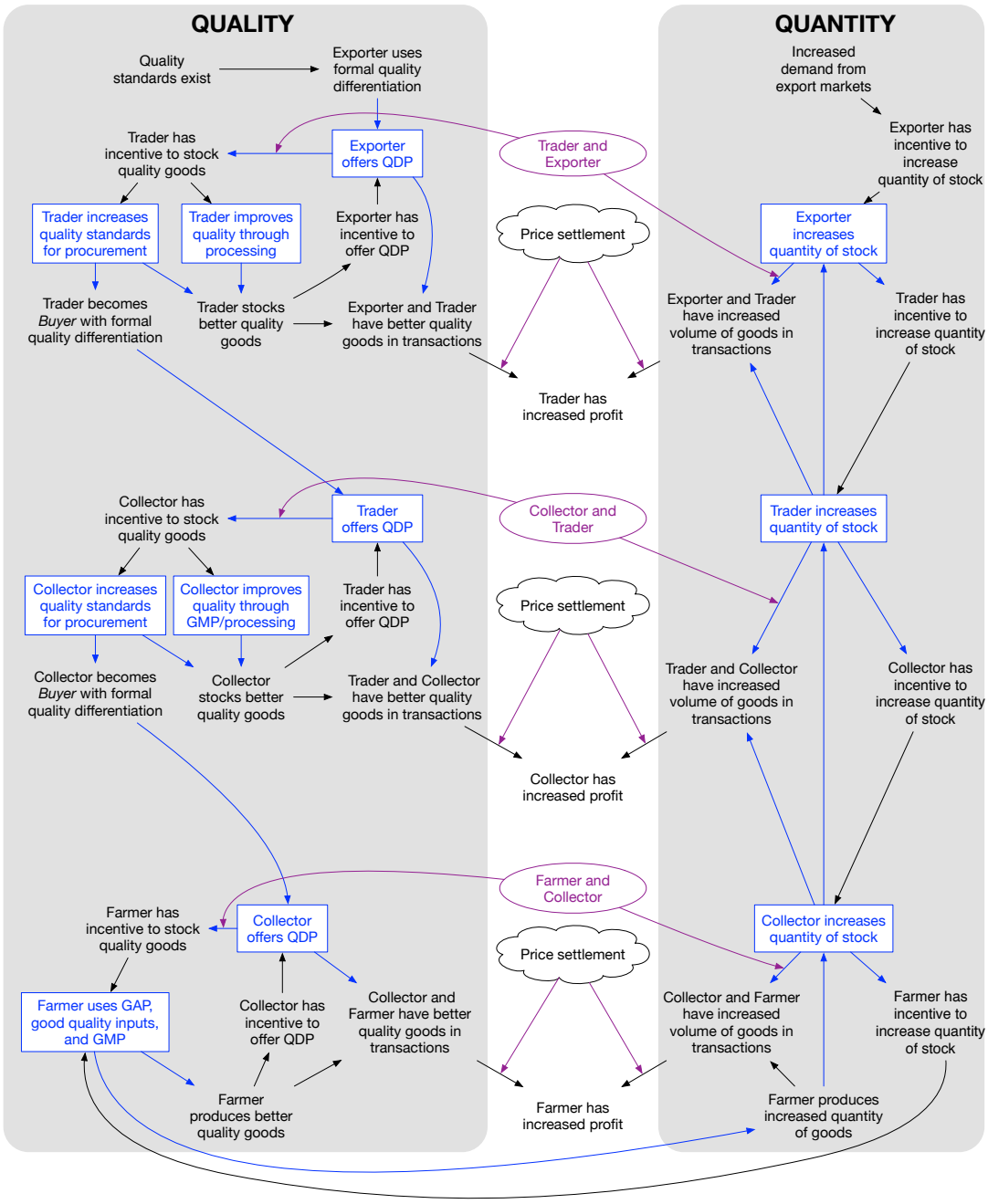

Figure 7: Expanded quality and quantity BRC map for outputs subsystem actors

7.3. QDP exists in the value chain

Our findings indicate that the **reinforcing loop has been initiated but that QDP is largely informal.** The traders that we interviewed observed that the quality of products is improving (see Table 3). Since we spoke only to traders who have been working with CPM and their insights were varied, it is unclear whether these results reflect the broader market system.

To a certain extent, quality-differentiated pricing is available. Quality affects how traders set prices (see Table 8), and most of the traders we interviewed offer better prices for better quality, even though not all use formal grading systems to do so (see Table 10). Furthermore, the traders we interviewed feel that they are accessing

better prices because the quality of the crops they sell has improved (see Table 7). With QDP available, farmers and traders have the incentive to produce, through good agricultural and processing practices, high quality crops.

Despite the clarity brought by the relationships and enabling conditions shown in the BRC map, we return to the question, "What initiates QDP?" Why is a trader (or farmer, or village agent) willing to invest in quality before QDP is offered? Why would a trader (or village agent, or exporter) seek a buyer offering QDP before good quality goods are available? Once enabling conditions are in place, how can actors be coordinated to provide better quality and QDP simultaneously?

7.4. QDP requires a set of coordinated and interacting changes by multiple actors.

One way to initiate QDP is to strengthen relationships among actors in order to promote transactions that optimize income across the value chain, rather than each actor operating solely in self-interest. For example, traders can initiate the positive feedback cycle of change by providing information about quality-differentiated pricing to farmers, and helping farmers improve their products through training on good agricultural and processing practices. Traders will not see this as worthwhile unless they see the bigger picture: that investing in quality production at the beginning of each season will increase everyone's incomes at harvest time. Before this can happen, traders need confidence in that bigger picture and the resources to carry it out. **Throughout the value chain, sellers must have the skills, knowledge, and equipment to improve quality, while buyers must have the finances and market access to offer higher prices.**

Discussion around price-setting revealed a process-oriented approach to QDP where each actor relies on the actions of other actors. For example, traders place a high importance on the prices they get from their buyers. As shown in Section 6.2, traders set prices based on export prices and proactively take ownership of the process through negotiations and competitive selling to get better prices, rather than just sitting and waiting for better prices to appear. Simultaneously, exporters must be willing to pay more, and are sometimes open to negotiations or building relationships with traders they procure goods from. On the other end, village agents and farmers must work with traders to arbitrate fair prices. In order for any actor to receive quality-differentiated prices, ostensibly all actors must be willing to offer and receive QDP; when all actors offer and receive QDP, it becomes a common phenomenon. **Increasing the number of relationships among actors enables better coordination as QDP becomes further institutionalized.**

7.5. Indicators of systemic changes related to QDP

As seen in Section 7.2, behaviors, relationships, and conditions enable QDP in a complex way. In this section, we aim to identify key aspects that should be tracked in order to see whether and how the system is changing, and how those changes relate to QDP. The key dynamics in this system revolve around quality and pricing. Of particular interest is the problem of identifying where to start: a quality-differentiated price is necessary to incentivize improvements in quality, but improvements in quality are necessary before quality-differentiated pricing is relevant. The first set of indicators investigate these dynamics directly.

- **Existence of quality-differentiated pricing for farmers.** Pricing that differs based on the quality of the product (whether formally or informally graded) is a necessary condition for incentivizing the improvement of product quality by farmers. This can be measured with a survey, but needs to take into account all of the methods, both informal and formal, by which traders set a price based on quality (see Table 10). For example, even if a trader does not offer two different prices for two different grades, he or she may take quality into account in setting the price.
- **Existence of quality-differentiated pricing for traders.** Before traders can offer quality-differentiated pricing to farmers, they need incentives for better quality from their customers. This could be measured with a survey of traders or of the major buyers in the marketplace.
- **Use of formal quality grading systems.** As the more formal and transparent of the methods for determining quality, use of a grading system and confirmation of prices associated with grades is a clear indicator of institutionalizing QDP and placing value on quality. This should be measured at both interfaces: farmers-to-traders and traders-to-buyers.

- **Changes in available product quality.** If quality-differentiated pricing is successfully incentivizing farmers to improve quality, the general quality of products available for traders and buyers to purchase should be improving. This could be measured with a survey of traders and buyers, but it would need to be designed carefully.

In addition to the key dynamics identified above, the study revealed several other factors as relevant to enabling the reinforcing loop that drives improvements in quality and pricing. These include:

- **Access to and use of finance.** Finance seems to be a key enabler for farmer, village agent, and trader productivity. Actors who can access—and choose to use—banks and loans can make better-informed business decisions and scale production and profits. An actor receiving a loan or taking advantage of a payment plan is likely to be sufficiently financially confident to engage in risk sharing activities. They can invest in activities that improve quality and, ultimately, reap the benefits of improved quality when QDP is available, contributing to the reinforcing loop described above. Indicator could include prevalence of loans and payment plans used, counts of bank accounts opened and closed by actors, and number of institutions (banks, microfinance agencies) that offer financial assistance.
- **Investment in physical capital.** Similarly, the purchase of equipment (silos, processing machinery, vehicles, etc.) indicates that actors have the financial capacity to invest in improving quality. Good agricultural, processing, and storage practices improve quality. These activities can be facilitated and expedited by equipment (machinery, silos, sprayers, tools). The ability to invest in equipment indicates business growth and surplus. Investments in physical capital that improve quality also show movement toward increased emphasis on the importance of quality. It is possible that this metric could be used to observe changes in perception of the importance of quality at scale.
- **Use of communication technology.** Communication is important for coordination of supply chains. Use of communication technology could be relatively easy to track, if farmers/traders are willing to share their internet and cellular use data (could be self-reported). Increases in ICT use may show strengthening relationships among actors, improved access to information used in making business decisions, and improved access to knowledge on good agricultural practices. While not directly an indicator of QDP, improved communication enables actors to coordinate decisions on quality and pricing.
- **Trader access to markets.** Access to better prices for traders seems to depend on their ability to access markets, including information and negotiation of prices across buyers, ability to export directly, etc. (see Table 8 and Table 9). Better prices for traders are, in turn, necessary for them to offer better (and quality-dependent) prices to farmers. Measuring access to markets is complex because of the variety of ways in which it is manifested, but indicators could be developed based on surveys of price-setting practices, measures of the actual prices paid compared to those available in the market, relationships among traders and buyers, or other similar concepts. A related indicator would measure whether traders are taking actions to increase their access to markets, indicating they are taking ownership of the issue.

8. RECOMMENDATIONS

8.1. Recommendations for future work

The qualitative methods used in this case study were effective for gaining deep insight into the experiences of six traders. From their perspective, market facilitation has led to positive changes. However, these traders are not necessarily representative of Ugandan traders. The limitations of this study dovetail with recommendations for the next steps in pursuing quality-differentiated pricing.

Strengthen QDP through future interventions. Our results suggest that QDP is critical to improving livelihoods, but that it is implemented informally and therefore remains underdeveloped. Future interventions should aim to strengthen the reinforcing loop of actions described above. We propose that the BRC maps and relationship maps may be useful tools for identifying intervention opportunities. The challenges and enablers listed in Section 6.3 may also provide starting points for designing new interventions.

Explore QDP from the perspective of other actors. This study observed QDP solely through the lens of six traders. While looking deeply at the cases of six traders provides insights into the variety of experiences and a general perspective of the relationships among actors and factors that affect quality-differentiate pricing, it is by no means comprehensive. Future studies that look at a larger number of traders may be able to use statistical analyses

to evaluate trends and correlations among factors that enable QDP. The traders interviewed in this study were not representative. All six have been through CPM trainings and are continuously monitored by CPM. All six have had some level of success improving quality and seeing subsequent price increases. Interviewing traders who have not worked with CPM may paint a broader picture of the state of QDP.

While studying the middle value chain actor (traders) gives insight into both upstream and downstream actors' experiences, interviewing exporters and farmers directly will help verify and validate the complex relationship between quality, pricing, and QDP. Additionally, exploring the experiences of producer organizations (like P1 and C3) may provide further insight into the role that groups play in decision making and pricing advocacy. Finally, understanding how the exporters' business partners and major buyers approach QDP could reveal important market-shaping behavior by significant actors in the market.

Study QDP for domestic markets. The traders interviewed in this study (except for C4) all sell explicitly to export markets. It is unclear whether QDP is driven by domestic markets. Further study should be initiated through engagement with significant actors in domestic food commodity markets.

Study correlation between knowledge of a grading system and incentive for improved quality. It is clear from this study that offering QDP creates incentive for other actors to provide better quality. A question that remains is whether the use of a transparent and formal grading systems creates more incentive for providing quality goods than the use of informal approaches like "reduce the kilograms". Does the transparent quantification of quality create more incentive to meet standards? Does knowledge of a grading system increase a buyer's purchasing standards?

8.2. Requests from traders

During interviews, traders expressed their gratitude to USAID Feed the Future for current interventions. They made several requests and suggestions for future facilitation initiatives and government interventions. Specifically, traders would like help with:

- Providing more trainings for farmers on using good agricultural practices to improve quality and quantity of crops, and building relationships with other groups that provide trainings.
- Continuing to learn good business practices.
- Connecting with more farmers, exporters, and external markets to expand business.
- Accessing finance to buy processing and storage equipment.
- Mitigating fluctuations in market prices.
- Accessing certifications for quality seed and crop providers.
- Improving transportation and telecommunication infrastructure

9. CONCLUSION

This subsystem study aimed to explore factors that enable quality-differentiated pricing (QDP) in the agricultural market system. Interviews with six traders of maize, beans, and coffee, revealed that quality and pricing are separate but interrelated aspects of transactions. Overall, these traders perceive that quality is improving through use of good agricultural, processing, and preservation practices, and that quality has improved as knowledge of these practices has spread. These traders also report buying and selling crops at higher prices than in the past. When buying, they set prices based on expected resale value, expected profit, and perceived quality. When selling, they negotiate with and compare prices among buyers, take actions to improve the quality of their goods, wait for market prices to change, and build reputations for having good quality. Quality-differentiated pricing exists in the market, but seems to manifest in two different ways. Some traders use a formal grading system. Others adjust the total price paid based on the expected quantity of high-quality crops in a given amount purchased. Traders also identified several challenges that must be overcome to improve the quality and prices of goods.

At the most fundamental level, QDP is propagated by reinforcing feedback: when some actors offer QDP, they create incentives for other actors to improve the quality of their goods and, in turn, offer QDP. Actors who

provide high-quality goods create an incentive for buyers to offer quality-differentiated prices. Throughout the value chain, sellers must have the skills, knowledge, and equipment to improve quality, while buyers must have the finances and a market to offer higher prices. The institution of QDP may be fortified by increasing the number and strength of relationships between downstream and upstream VC actors so that they can coordinate their activities to improve the quality and price of goods. Opportunities exist for facilitative interventions that promote quality-differentiated pricing throughout the supply chain.

10. CONTACT

The Feed the Future Uganda Market System Monitoring (MSM) activity welcomes feedback. Please contact us at msm.uganda@mit.edu.

APPENDIX A: PILOT INTERVIEW GUIDE

SECTION I: Background / confirm profile

1. What is your business?
2. What crops do you trade? (e.g., maize, beans, coffee)
3. Do you work with agents or farmers? How many? What kinds of volumes do you receive from them?
4. What services do you provide? Cost share equipment?
5. How many exporters do you sell to? What kinds of volumes do you sell (ask in ranges)?

SECTION II: Understanding quality-differentiated pricing

1. Have you been able to purchase high-quality products? How have you accomplished that or what have been the challenges?
2. Have you tried anything to enable better quality, such as providing extension services to farmers / village agents or supporting good agricultural practices? How has that worked?
3. Do you offer a different price for higher-quality goods? Why or why not? Would you like to? Has anything prevented you from doing so?
4. How do you rate quality?
5. Have you been able to sell high-quality product for a better price than low-quality product? How have you accomplished that or what have been the challenges?
6. Have you tried anything to get access to quality-differentiated prices, such as working with different exporters or accessing foreign markets? How have you done so and what have been the challenges?
7. How do you obtain information on market prices (both for purchases and sales)?

SECTION III: Business

1. What are your major successes? (w/ farmers, VAs, exporters)
2. What are your major challenges? (w/ farmers, VAs, exporters)
3. What are the key relationships enabling or blocking you from success? For example, do you have relationships with people you sell to, e.g. exporters? People you buy from, e.g. agents and farmers?
4. How do you manage your business?
    a. What do you do on a weekly basis?
    b. How do you manage your list of customers? Suppliers?
    c. Have you thought about or employed a financial accounting system (bookkeeper)? As way to figure out your profit or use financial records to make business decisions?
    d. Do you employ other people? What do you look for when you hire, e.g. skills?

APPENDIX B: REVISED INTERVIEW GUIDE

Introduction

- Introduce ourselves: names and affiliations. I am professor, they are students.
- Why we are here: learn about your experience with improving the quality of the products you are able to purchase and sell. Part of a research project funded by USAID.
- How this will work: Talk for one hour. First, basic background, then about buying quality products, then about selling, and finally more generally about your business and your goals. I will ask the questions, and they will take notes.
- Consent and recording: We would like to use this as part of our research on change in agricultural markets, and we would like to record the interview. Explain form. Are you willing to participate?
- Do you have any questions for me?

SECTION I: Background

1. What crops do you trade?
2. Do you work with agents and/or farmers?
    a. How many?
    b. What proportion of your purchases are from farmers vs agents?
3. How many different organizations do you sell to?
    a. Are they exporters, processors, a local market, or what else?
4. How long have you been in business?

SECTION II: Buying

Now, I want to ask you about improving the quality of the products you are able to buy.

1. Are you happy with the quality you receive?
    a. How do you rate quality?
    b. Where and when is quality assessed, and by whom?
2. Do you offer a different price for higher-quality products?
    c. How do you implement this differentiated pricing?
        i. Who does this [stage in VC]
    d. How do you set the price?
    e. How do your agents and farmers know what your price is?
    f. When are your agents and farmers paid? How are they paid?
3. [You have good quality now.] 5 years ago, did you have the same quality or was it worse? What have you done in the last several years to ensure better quality is available to you to purchase?
    g. What are the steps you took to encourage better quality?
        i. [Not enough time to do this thoroughly; did not do] Prompt for all activities with farmers, then with agents, then your own [trader] activities
        ii. [Not enough time to do this thoroughly; did not do] If needed, prompt with examples to make sure we cover:
            1. Incentives (financial, including pricing)
            2. Relationships developed
            3. Providing information and training to farmers
            4. Providing goods and services
        iii. What were the challenges, i.e. what was difficult in doing these things?
        iv. Did you try anything that did not work? Why did it not work? Did you figure out a way to make it work?
    h. How fast did quality improve? When did it start to improve? What changed first?
        i. [Did not understand 'relationships'] Did your relationships with other actors change? How? (contracts, informal agreements, incentives, etc.)
    i. How will you expand this approach to more agents/farmers? Have you already expanded beyond your initial group?
        i. What resources would/did it require to expand the approach?
        ii. [Did not understand 'relationships'] What relationships would be required?
        iii. What are the challenges to expanding the approach?

1. What's stopping you from reaching your goal? [answer] What's stopping you from doing that? [answer] ...

Section III: Selling

1. Do you sell more than one quality grade, at different prices?
    a. Where and when is quality assessed, and by whom?
    b. How do you decide where to sell (e.g. how do you know what the prices are)?
    c. When are you paid? How?
2. Do you now get a better price than you did 5 years ago? What have you done to improve the price you get from exporters?
        i. [Don't prompt] Examples: working with different exporters, negotiating with exporters, attending trade fairs, accessing foreign markets
    b. [No one understands relationships] Have you developed any new relationships in the last few years that help with this access to better pricing?
    c. What are the challenges? i.e., what makes it difficult to get good prices for your products?
3. How quickly did these steps lead to better pricing for you?
    a. What changed first? What took time? (e.g. trust developing over time)

SECTION IV: Business and Future Goals

1. How do you manage your business?
    a. How do you do your finances? Do you use financial information to determine your profit, set prices, or make other business decisions?
    b. How do you manage your agents and farmers? Exporters?
    c. [Have not been asking] Do you employ other people? What do you look for when you hire, e.g. skills?
2. [Not well understood] What are the key relationships enabling or blocking you from success?
    a. For example, do you have relationships with people you sell to, e.g. exporters? People you buy from, e.g. agents and farmers?
3. What are your goals for the next few years for the business?
4. What are your major challenges to overcome?
    j. [If we didn't already do this…] What's stopping you from reaching your goal? [answer] What's stopping you from doing that? [answer] ...

Wrap-Up

- If there is time, ask for a tour
- Do you have any questions for us?
- Thank you very much for your time!