Understanding Agricultural Value Chains that Supply Nairobi

A summary of 3 studies carried out in 2019 - 2022

May 2022
Background

FSD Kenya partnered with Virtual City to better understand the value chains of fresh produce in Nairobi. The purpose of the assignment is to understand the operations of the packhouses by answering questions about finances, market information, constraints, barriers, and opportunities.

The study sought to answer 3 hypothesis

- Financing constraints are an important obstacle to the efficiency of agricultural value chains affecting all players in the chain
- Financing constraints are primarily caused by informational asymmetric, which in turn limit trust amongst players and opportunities to expand markets beyond existing trade networks
- Informational and financing constraints could be addressed through the digitization of value chain data and the establishment of data platforms

The study was carried out in 3 phases between 2019 and 2022
### Approach – 3 phases of data collection

<table>
<thead>
<tr>
<th>Phase</th>
<th>Purpose</th>
<th>Key insight specific to digitization</th>
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</table>
| Phase 1, 2019-2020  | **Exploratory** – Understanding the traditional agricultural value chains that serve Nairobi -  
- 382 hotels, restaurants, institutions, and groceries in northern Nairobi were visited to get contacts of their suppliers.  
- 60 Supplier interviews were completed  
- 30-day data collection from 4 packhouses | Restricted to those serving northern - Nairobi Ngara, Pangani, Mathare, Eastleigh, Umoja, Zimmerman, Pipeline, Ruaraka, Kasarani, Githurai and Donholm neighbourhoods. |
| Phase 2, Nov 2020   | **Deep-Dive** - Understanding the traditional agricultural value chains that serve Nairobi  
- Focusing on the 4 packhouses  
A 10-day data collection exercise September - October 2020 capturing qualitative and quantitative data | |
| Phase 3 March 2022  | **Exploratory** - Understanding emerging value chains that focus on farmer-to-user brokers  
- 23 in depths with aggregators, processors and a farmer | To qualify for the interview (no restricted to coverage)  
1. Buy directly from farmers.  
2. Approximately 60% or more of their total weekly purchases are directly from farmers (most challenging)  
3. 70% of their sales are to institutions, hotels, retailers, households, processors  (If Export in the top 3, exclude)  
4. Do either of the following - Clean, Sort, Repackage the produce |
Understanding Purchasing from brokers
Dealing with brokers has its challenges, yet buying directly from farmers is logistically difficult.

Brokers are not exclusive to a certain buyers. They tended to have long-term relationships with the packhouses built on trust.
<table>
<thead>
<tr>
<th>Issue (ordered by weight of mention)</th>
<th>Comment Based on tracking 37 lots</th>
<th>Current mitigations measures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Price fluctuations</strong></td>
<td>16/37 of the lots (43%) had a buying price below/above expectations. Owing mainly to supply</td>
<td>Mainly use savings to top up Use informal credit e.g. borrow Mpesa float Average top up amount Ksh. 20,000.</td>
</tr>
<tr>
<td><strong>Increase in aggregation days</strong></td>
<td>9/37 of the lots (19%) were late by a few hours to 5 days.</td>
<td>Next order placed immediately the prior lot is received, traveling to the farm to hasten the process</td>
</tr>
<tr>
<td><strong>Quantity below expectations</strong></td>
<td>8/37 (22%) of the lots were below quantities expected. Owing mainly to quality issues</td>
<td>Prioritize regular clients Having to buy from “random brokers” to meet shortfall</td>
</tr>
<tr>
<td><strong>Quality issues</strong></td>
<td>4/37 of the lots (11%) were below expected quality in terms of either size, color, state of ripening/maturity</td>
<td>Random farm visits, repackaging and mixing with the better-quality produce, sell at a discount</td>
</tr>
<tr>
<td><strong>Transport</strong></td>
<td>Road related issues significantly increase costs</td>
<td>On average accounts for 20% of the total expenses. Ranging from 17% - 30%,</td>
</tr>
<tr>
<td><strong>Inflationary behavior</strong></td>
<td>Brokers concentrate in accessible areas, it creates an imaginary increase in demand, prices.</td>
<td>Directly facilitate broker, e.g.. through a motor-bike fuel stipend to reach far-off localities</td>
</tr>
<tr>
<td><strong>Poor relations with farmers</strong></td>
<td>Dealing directly with farmers with no brokers is unattainable</td>
<td>Make payments directly to the farmers</td>
</tr>
<tr>
<td><strong>Poor customer service</strong></td>
<td>Unreachable, misuse transport funds</td>
<td>Seek to pay transporter directly though not always practical.</td>
</tr>
</tbody>
</table>
The key problems along the agricultural value chain were not regarding efficiency

But rather maintaining stable and reliable trade relationships that reduced risk and uncertainty.

Two widespread uncertainties that need to be addressed

- **Uncertainty in prices** - addressed by maintaining a wide network of brokers, working closely with 1-2 brokers with fixed intervals of large purchases, maintaining a wide network of other traders, conferring on price, and accessing fast and easy credit/cash mainly through informal channels.

- **Uncertainty in quality**– addressed by farm visits, maintaining a wide network of brokers, developing close ties with one or few dedicated brokers, providing specific instructions to graders who can still find good quality amidst a poor crop, identifying different customer segments who require different quality, discounting poor quality produce and mixing the lower quality with the higher quality or using optics/displays to hide poor quality

Strong social connections are key in addressing these uncertainties. Packhouses associate closely with other traders to share information on brokers, trucks, offer each other loans, sell for the other packhouse when unavailable, form chamas, etc.
Packhouses/aggregators are not homogeneous

<table>
<thead>
<tr>
<th>Traditionalistic Aggregator</th>
<th>Price fighter Aggregators</th>
<th>Supply chasers Aggregators</th>
<th>Range Aggregators</th>
<th>Tech Aggregators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialize in 1-2 items</td>
<td>Specialize in one fast moving produce like tomatoes</td>
<td>Specialize in one produce Deal in commodities for which establishing all year supply is challenging</td>
<td>Handles multiple items</td>
<td>Use platform</td>
</tr>
<tr>
<td>Minimal investment in space</td>
<td>No capital investments</td>
<td>Purse other businesses/produce when main produce is off-season</td>
<td>Some capital investment</td>
<td></td>
</tr>
<tr>
<td>Sole Proprietors, 1-3 casual employees</td>
<td>Sole Proprietor, 1 casual employee</td>
<td>Some capital investment space</td>
<td>Sole proprietor or has1-2 employees</td>
<td></td>
</tr>
<tr>
<td>May or may not have vehicles</td>
<td>No vehicles</td>
<td>No, or single or multiple vehicles</td>
<td>No vehicles</td>
<td></td>
</tr>
<tr>
<td>Aggregate at farm level mainly through a broker</td>
<td>Purchase from farms or brokers’ market</td>
<td>Purchase from brokers - huge effort insourcing</td>
<td>Purchase from other aggregators</td>
<td></td>
</tr>
<tr>
<td>Maintain long term relationships with brokers mobile money</td>
<td>Maintain some relationships with brokers</td>
<td>Use cash, mobile money and bank transfer</td>
<td>Operate in cash, mobile money, bank transfer,</td>
<td></td>
</tr>
<tr>
<td>Transact through personal bank account (if need be)</td>
<td>Operate in Cash</td>
<td>Offers credit</td>
<td>Offer credit</td>
<td></td>
</tr>
<tr>
<td>Irregular clients who purchase on quality and price, minimal pre-orders</td>
<td>Transact through personal accounts (if need be)</td>
<td>Regular clients with pre-orders e.g., fruit processors</td>
<td>Regular clients with pre-orders</td>
<td></td>
</tr>
<tr>
<td>Break bulk</td>
<td>Irregular clients, quality and price driven, no pre-orders</td>
<td>Value addition includes, sorting, cleaning, repackaging or branding</td>
<td>Higher margins</td>
<td></td>
</tr>
<tr>
<td>Value addition restricted to sorting, grading</td>
<td>moderate margins,</td>
<td>Break bulk</td>
<td>Break bulk</td>
<td></td>
</tr>
<tr>
<td>No delivery to customers</td>
<td>Break bulk</td>
<td>Value addition restricted to sorting and some grading</td>
<td>Value addition includes</td>
<td></td>
</tr>
<tr>
<td>Fewer, high value transactions</td>
<td>Value addition restricted to sorting and some grading</td>
<td>Does not deliver to customers</td>
<td>sorting, cleaning, repackaging or branding</td>
<td></td>
</tr>
<tr>
<td>Skepticism towards automation</td>
<td>Customer</td>
<td>Multiple small value transaction</td>
<td>Delivers to customers</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Multiple, medium value transactions</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Might have own automated system or are receptive</td>
<td></td>
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</table>
Selecting well-suited packhouses in the value-chain is a critical step in the early stages of digitization; they are the catalyst

Notably

- They procure from a wholesaler, larger packhouse as opposed to informal, fragmented value chains which involve farmers or brokers
- They predominately deal with regular clients, preferably with a pre-order system (telephone handwritten lists, etc.)
- Have multiple employees
- Minimal retail sales
- Value preposition of quality and predictability of supply
- Increased traceability through digitizing might present a value preposition for niche segments

The range aggregators could be early adopters of digitization

More likely to deal with clients willing to pay more for the conveniences of delivery, cleaning, less hassle

More likely to sell and maintain relationships directly with hotels, institutions, and supermarkets.

More likely to have pre-order clients.

Less likely to supply groceries or mama-mbogas given the price competitiveness

Digitization’s benefits of accountability and transparency were not strong value prepositions for sole entrepreneur, one-man packhouses.
Packhouses have ambitions; digitization should present a preposition in line with these ambitions

Geographical expansion “In the next 3 years I wish to open 2 more branches.

Delegation “Getting trusted people to employ is a challenge. Am not good at keeping records how will I control them, not sure if there's a solution”

Fixed asset acquisition - “soon I need to buy more trucks”

Increase floor space “I would also wish to get a bigger warehouse/storage facility.”

Product diversification “I would like to start another side business of general food-stuff purchase”

Capital for expansion (not operating capital) “am servicing a motor vehicle loan but I also need to acquire a bigger premises accessible my clients.”

Vertical integration - “I want to own farms to grow the crop”

Transition - “I want to hand over the business to my son”
Aggregation
Farmer to user
Consistently purchasing from farmers is challenging

- Aggregation costs are significant, **high volumes are needed for profitability**. Smaller aggregators who claim to buy directly from farmers possible rely heavily on the open markets. Larger aggregators may have collection points to minimize aggregation costs. Costs to aggregate include – transport, harvesters, sorters, packers, loaders, and aggregator’s time.

  “I order between 13 to 20 tons at ago given that sourcing takes time and also the distance, you wouldn’t go for instance in Malindi and come back with 2 tons, it won’t make any sense because of the transport cost”… (Aggregator)

- Aggregation from farmers focuses on a particular product (1 or 2) across various regions in the country and outside the country, as opposed to multiple products

- **Neighboring counties** (Kiambu, Murunga) dominate in the direct farmer–user value chains for highly perishable produce; it lowers aggregation and storage cost. The increase in fuel prices further pushes aggregators to neighboring counties. “costs of transportation is a challenge, and we are now forced to focus on farmers that are on the outskirts of Nairobi (aggregator)

**Farmer-to-table and organic value prepositions are credence-based prepositions.** The buyers can only know that it is not authentic when the buyer is caught.
Aggregators deal with farmers and brokers using different models

<table>
<thead>
<tr>
<th>Trader</th>
<th>Finder</th>
<th>Employed</th>
<th>Farmer rep</th>
<th>Contractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buys and sells</td>
<td>Identifies farms, links to aggregator who discusses prices with farmer, pays farmer directly, brokers organize for harvesting, sorting, etc. paid a commission by the aggregator</td>
<td>Employed by the aggregator</td>
<td>Identifies farms, broker negotiates selling price, aggregator pays farmer directly, broker gets a commission from farmer</td>
<td>Contracts farmers for short tenure crops e.g., cabbage, may pay a deposit agree on quantity and buying price, May support with agronomist knowhow</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Broker</th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Brokers dealing with Mangoes in the coastal region have created a big gap between us and the farmers and so we totally depend on them (aggregator)</td>
<td>“broker is paid per avocado plucked; he comes with labors to do the plucking, if a piece is 10shs, the farmer gets 5 shillings, broker gets 2shs (aggregator)</td>
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Brokers are part of the ecosystem The problem with Safaricom is trying to remove them but it’s next to impossible since they play a big role in the market. And farmers rely on the middle-men, since they don’t have access to the market, unless we create Sacco’s for farmers to take their produce, ..... What I think would work is like a farmers’ market where they showcase their produce at a fair price. (aggregator)
Aggregators have more enduring relationships with larger farmers and larger buyers than small farmers.

- **Informal contracts with farmers are not enforceable** (verbal contracts), farmers sell to the **highest bidder**, may offer less produce than agreed, and have difficulties accepting **rejected produce**. (Twiga offered farmers what aggregators called “cheap deals” which were not enforceable)
  
  “some get tired on the way, and they give you substandard and when you don’t take them, they feel bad.” (aggregator)

- **Large farmers** provide volumes, **minimize the number of transactions** (cost of multiple transactions), and create opportunities to **build long term relationships**

- Larger farmers can take on some of the **on-farm aggregation logistics**, plus are more likely to give **short term credit** (1-2 days) to regular aggregators
  
  “… I don’t even need to travel to the farm, I would send a track to pick and still get the best and also with such farmers they would give you a grace period of 1-2 days to sell and pay..” (aggregator)

- Aggregators may give **short-term credit** (2-3 days) to informal large buyers, e.g., wholesalers/retailers. (For example, one aggregator allows credit to those that have proof of getting tenders to supply institutions/formal organizations. They sign an agreement with which is counter-signed by a witness.

Inability to purchase on credit was not **outrightly discussed as an urgent issue**

“I like that it that why because whenever you are done with sales in the evening you don’t owe anyone...” (Retailer)
Niche/premium buyers & large enterprises offer a better price, but fulfilling these orders is a challenge.

- **Quality is static, yet external factors (e.g., weather) are erratic** “we have a pen as a mark of the height of the potato needed,... it hasn’t rained... getting those potatoes is a challenge... (aggregator) **Quality supersedes all relationships.**

- **The cost of QC on the aggregator** can be substantive “We buy the entire farm and agreed on X, at sorting I sometimes pay the sorters a premium for grade A sacks.” (aggregator)

- **Payment terms start from 30days.** “I had a contract two years ago to supply a supermarket which only paid once they sold....I said no, I better sell to someone who takes 10 kgs and he pays me there and then” (aggregator).

- **Debt collection costs**

- **Daily deliveries can be challenging.** These clients do not wish to incur holding costs. “...an LPO of 30 tons for 30 days you deliver weekly, raise an invoice but the next week you need to deliver again....” (aggregator)

- **Fixed buying price over the LPO period** *(an advantage & disadvantage)* subsequent price changes are a bureaucratic
  - Difficult to monitor payment terms/lack of transparency *(power imbalance)* - for example, to be paid once stock has been sold, how is it monitored?
  - Dealing with returns gaining balance after selling the stock that then is returned as reject is difficult (aggregator).
  - Tedious application process “ I hear they advertise on papers, who has time to read papers.”
  - Corporate communication - e.g formal emails and letters as opposed to WhatsApp, SMS, calls
  - Navigating the competitive space (described as unfair) “…also get the cartels ..(aggregator)
Serving medium-sized enterprises is more attainable. It allows aggregators to build sustainable relationships

Aggregators serving niche/premium buyers & large enterprises must include middle- lower-level buyers, or households to survive “at farm level you take everything medium-small potatoes to go to other outlets or households... then the best go to this chain...” (aggregator)

• Quality is not static, and they do not seek the most premium produce

• Payment terms are negotiable depending on the relationship (aggregators preferred credit terms of 7 days or less )

• May explore other financing models, e.g., provide cash to aggregators to source, which results in lower margins for the latter.

Medium enterprise from the perspective of an aggregator

Kilimajaro Jamia Restaurants
3 branches, 2 in CBD, 1 in Eastleigh
**Access to credit for aggregators does not necessarily translate to better prices for farmers.**

Better prices to farmers tickle down when

- **Premium buyers pay a higher price for higher quality** (at sorting farmer gets a better price for quality A)*

- **Certification process** (Global GAP certification) that indicates a better quality

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Direct farmer to aggregators sales may not always eliminate the exploitation of the former, especially for those dealing with highly perishable produce.

A tomato aggregator deals exclusively with farmers who deliver to a Githurai warehouse. He moves 220 boxes of tomatoes per day mainly from Kirinyaga- across a 7 months season, the farmers organize transport. He has 5 regular farmers who supply, and sorting is done on the farm through casuals.

Farmers may be paid less than the asking price owing to quality “I bought it at 4,000K but I have not been able to get my money back because people are saying that it is too soft and is easily destroyed, I will have to pay at is 2,000K because the value has gone down, you can only sell it to those going to use immediately….will pay the farmer less.

He communicates with farmers on the market and buying price and gets a maximum of 2-days credit from the farmers. He supplies groceries in Mwiki. Mathare, Githurai.

He belongs to a tomato aggregator Chama Nyanya Shitu made up of 52 members. He can access a loan of 50K from the chama and for every truck that delivered tomatoes, he gives Ksh.300 to the chama. “It helps regulate the relationship between buyers and farmers.”

Should the chama be made aware that an aggregator has not paid a farmer, chama makes the payment and considers it a loan.

*aggregator urgently needed 100K during week 2 of the follow-up interviews This was facilitated through a discount offer from a shylock; his buying prices did not change
Reaction to a digitization concept
Based on the digitization concept that they were exposed to

**Strengths**
- **Efficient management of multiple outlets** - I had three branches but it was a challenge to get trustworthy employees so I had to close one branch and operate two only, this may have helped (aggregator)
- Debt management/collection
- Good for tracking deliveries
- Permanency of records
- Works well for partnership – sharing of info “partnership because the records can be shared easily
- Level of details especially capturing expenses, tracking deliveries against payments

**Opportunity**
- Update on availability from the farm *By the fact that it will help with us communicating with the Farmer and knowing what they have, it will reduce our pressure of confirming if the stock is available and at what volume (aggregator)*
- Early farm booking, system (if able to see size)
- Track movement from farm to processor
- Ideal for those starting with no system in place
- A brokers, aggregators platform.
- Allow offline access/use
- Incorporate farmer tutorials (basic info heavy text farmers will not use it)
- Include farm prices
- Automated reminders to debtors

**Weaknesses**
- **Skills & day to day management**
  - Requires a dedicated employee e (additional costs) / cumbersome data-entry *Wouldn’t the routine be the same, keying in details at the end of the day?*
  - For formal businesses that give receipts, etc.
  - A stiff learning curve, fear of technology
  - Capturing one-off farmers purchase/constantly changing farmer lists
  - Capturing irregular buyers, retail buyers – capturing their transactions
  - Too many personal details, utility, ID, etc.
  - Differentiating brokers and farmers
  - Managing numerous transactions
  - Integration with other accounting systems
  - Use of basic phones

**Data security & costs**
- Data security issues (*sharing with other buyers, KRA, etc.*
- Costs- internet, user charges, employee

**Visibility of transactions** was not strongly mentioned as the most urgent need. A PoS that offers record-keeping was a not strong selling point; it lack differentiation from other solutions in the market.
End