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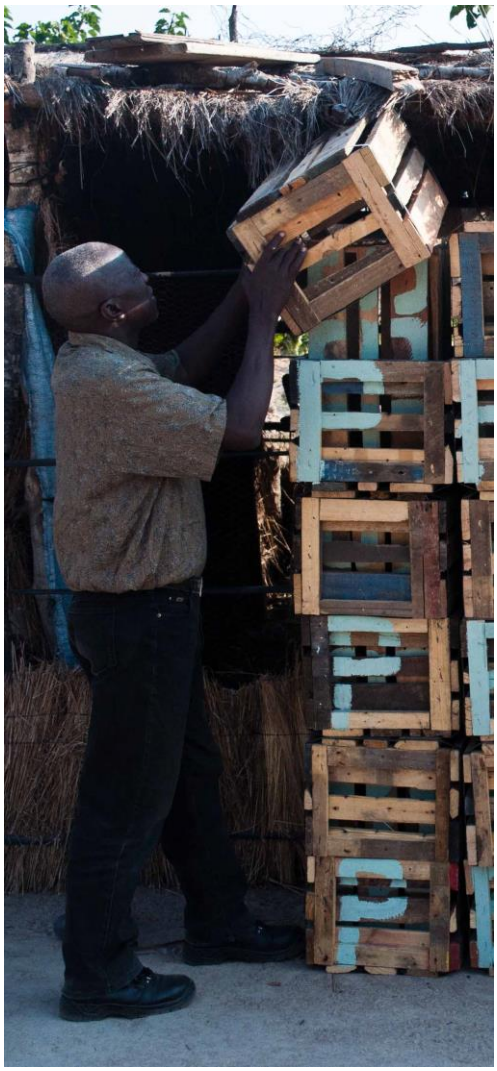
REFINE 3 Output Marketing Report

Prepared for iDE Zambia by IDinsight

24 December 2015



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Introduction

iDE Zambia's Farm Business Advisor (FBA) Programme seeks to improve rural livelihoods in Zambia by developing a corps of entrepreneurs that connect geographically isolated farmers with inputs, credit, services, and market access. In 2014 iDE and IDinsight began a partnership, labeled the REFINE initiative, to improve the FBA model through nimble operational research exercises.

In early 2015, IDinsight conducted a situational assessment of iDE Zambia's FBA program to identify strengths, challenges, and areas of opportunity. One finding was that the output marketing pillar of the FBA program had untapped potential to be a viable source of additional FBA income. Additionally, iDE staff identified unreliable market access as a key challenging hampering the productivity and livelihood of FBA catchment farmers.

iDE and IDinsight developed an intervention to enable FBAs to earn an income by conducting activities that assist horticulture farmers to access improved markets and reduce the transaction costs of selling vegetables on the open market. This intervention was piloted with five Lusaka-based FBAs over a three-month period from July – October 2015. During this time, IDinsight carried out a process evaluation to monitor the pilot's uptake and gain a deeper understanding of the dynamics of Lusaka horticultural markets.

This report is divided into two sections. The first section summarizes the dynamics of local horticultural markets and common farmer challenges, and the second section details the design, findings, and recommendations stemming from the pilot exercise.

Dynamics of Informal Vegetable Markets

Most vegetables grown in Zambia are bought and sold in the informal, open market. Despite modest inroads made by Melissa, Spar and other supermarkets, 95-97% of Lusaka households purchase their produce from traditional sources (wholesale markets, retail vegetable stands, etc.).[1] Formal markets (grocers, supermarkets, etc.) are still nascent and inaccessible to most smallholder vegetable producers. While many producers express interest in selling within formal contract markets, many are unable to meet the supply, quality, and accreditation demands of these formal buyers.

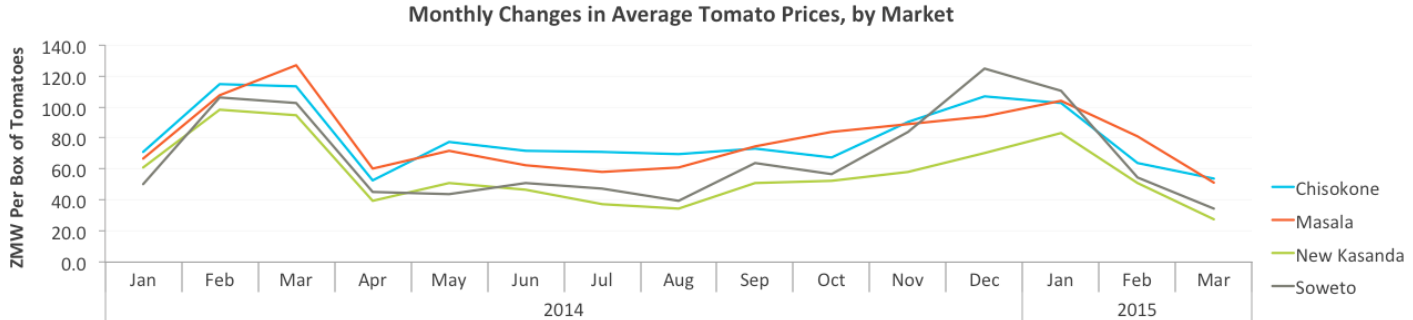
This pilot project focused on the informal market sector due to its wide prevalence and scope. Within the Lusaka catchment area, open markets can be divided into three broad categories: local markets, Soweto Market, and peripheral markets. While each of these market types share certain cross-cutting commonalities, each has their own unique characteristics that play to the advantage and detriment of smallholder sellers. Finally, while each of these markets are theoretically "open" in nature, farmers must navigate a complex web of market actors and hidden costs in order to sell their produce at a fair price.

Cross-Cutting Theme 1: Price Volatility

Lusaka's informal markets are notable for having a high degree of price volatility. The price of a box of tomatoes can vary by as much as 50 ZMW depending on the time week or even the tim of day. Smaller markets can quickly become saturated if too many farmers bring produce at one time for sale. While there are some clear broad trends – prices are lower at the end of the rain season when farmers can bring rain-fed crops, and higher during dry months when only farmers with irrigation access can produce vegetables (see Figure 1) – much of this variation is difficult to forecast.

[1] Hichaambwa, Munguzwe. "Structure of Lusaka Fresh Produce Market in Zambia." *AgWater Solutions Project*. Bill and Melinda Gates Foundation, 1 Sept. 2012. http://awm-solutions.iwmi.org/data/sites/3/documents/pdf/country_docs/zambia/zambia-fresh-markets.pdf

Figure 1: Fluctuations in Average Tomato Prices Across Markets[2]



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
	2014												2015		
Chisokone	70.9	114.8	113.6	52.7	77.3	71.5	70.8	69.3	72.9	67.8	90.4	107.1	102.3	64.0	54.1
Masala	66.4	107.3	127.2	60.4	71.7	62.6	58.4	61.3	74.6	83.9	89.0	94.1	104.0	80.9	51.3
New Kasanda	61.1	98.1	94.6	39.4	51.0	46.6	37.1	34.4	50.7	52.3	58.4	70.5	83.0	51.0	27.6
Soweto	50.2	106.0	102.3	45.6	43.5	51.1	47.3	39.5	63.6	57.0	84.0	125.0	110.5	54.5	34.3

On any given day prices will not only differ from those of the previous day but will also differ between markets. These price discrepancies are driven, in part, by the fact that farmers are ill-equipped to respond to high prices or arbitrage opportunities between markets. Based on packaging material constraints, or pre-existing agreements with specific market actors, some farmers are locked into selling within one specific market. Furthermore, many farmers do not own their own vehicle, and either must aggregate with neighbors or rely on independent transport agents.

Cross-Cutting Theme 2: Transport

Transporting produce to distant markets is a widespread challenge faced by smallholder producers. Farmers will arrange for transport either by:

1. Hiring a **locally-based** transporter[3]
2. Hiring a **Lusaka-based** transporter, arranged via a market agent
3. **Hitch-hiking** from the roadside

[2] Collected using data from iDE's LimaLinks program from Jan 2014 – March 2015. Of the four markets shown only one, Soweto, is geographically located with Lusaka.

[3] Local transporter are typically the preferred option since drivers are members of the community and willing to arrange pick-ups directly from the farm

Figure 2: FBA Transporter

In the Lusaka area, transporters charge farmers on a per-box rate (e.g. 8 ZMW per box of tomatoes, or 7 ZMW per sack of greens) that is fixed based on market distance. These distance-based prices are largely agreed upon for a given area and are difficult for a farmer to negotiate.[4] This system of per-box pricing simplifies the process of aggregating crops (transporter can easily divide costs between many farmers) but are notably expensive and represent the largest transaction cost incurred by farmers (see Appendix 3).

Market Category 1: Local Markets

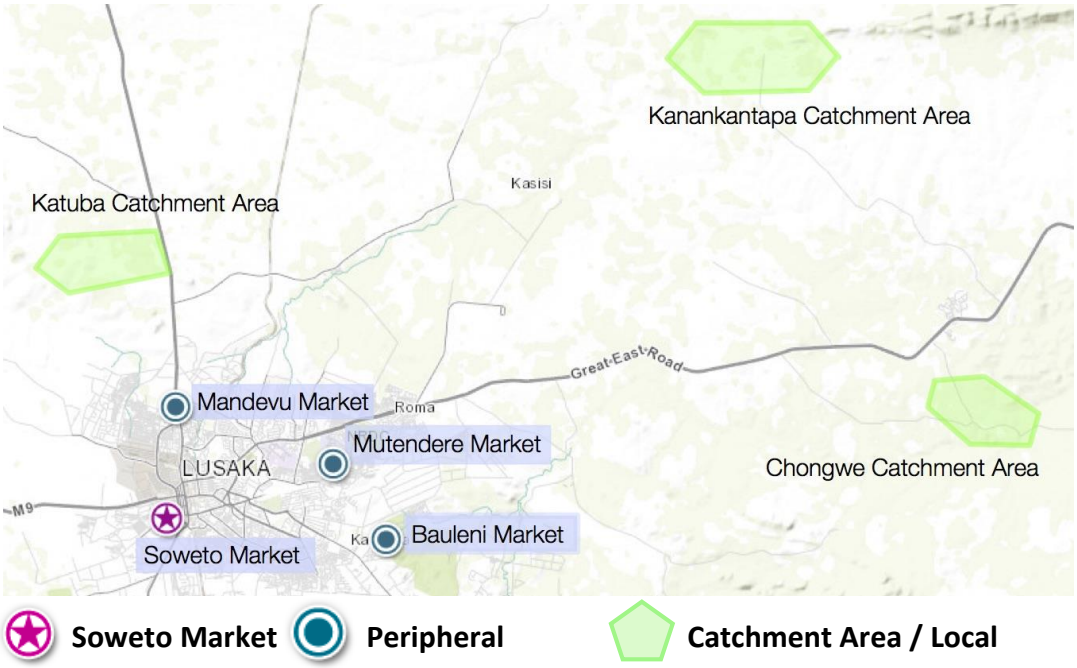
The term local "local market" is a loose categorization of markets located within, or very close to, farmer catchment areas. These markets supply food to the local community and are small in nature. Local markets are the easiest for farmers to sell within: they are nearby, require little or no transportation to reach,[5] and are devoid of brokers or intermediaries.

However, local markets are constrained by their small size. These markets have very limited buying power, and prices can quickly plummet if too many suppliers try to sell simultaneously. For this reason, smallholder farmers with even a modest production of vegetables typically look to the larger, more distant markets to earn a viable income.

[4] Local transporters, when interviewed, were unwilling to deviate from accepted prices – even for repeat customers that could provide steady business. One reason transporters cited for this rigidity was the risk of vehicle break-downs, and that other transporters would be unwilling to assist them if they were perceived to be undercutting the market.

[5] In many local markets retailers will purchase and pick up produce directly from the farm.

Figure 3: Location of Lusaka Markets and Farmer Catchment Areas (Non-exhaustive)



Market Category 2: Soweto Market

Located near downtown Lusaka, Soweto Market is the largest market available to farmers in the Lusaka region. (See Figure 3) Thousands of tomatoes, onions, and other vegetables are sold within Soweto on a daily basis that supply the majority of Lusaka's restaurants, grocers, and street-side vendors.

Despite its moniker of being an "open market," farmers selling within Soweto market must navigate a complicated web of actors and hidden fees. First-time sellers in the market quickly learn that market levies need to be paid[6], brokers need to be hired, and that the market is anything but "open" in nature.

Figure 4: Sellers in Soweto Market



[6] The Soweto market council collects levies from every farmer selling within Soweto market. Farmers generally perceive this to be an unfair tax, with no noticeable services or infrastructure provided in return for it.

Market Agents

In most areas of the market, farmers are prohibited from selling on their own and must hire brokers, or "market agents," to sell on their behalf. These market agents provide a number of services. First, market agents guarantee the safety of farmer goods. Farmers that operate without a market agent will quickly find themselves harassed or risk robbery by thieves and cadres.[7] This threat of vandalism and theft effectively guarantees the role of the market agent and closes the market off to independent sellers.[8]

Besides guaranteeing security, market agents act as a broker on behalf of the farmer. Markets agents will stand with the produce during peak market hours[9] and handle all sales operations. For this service, market agents are paid a commission, which is typically 10% of the sale price.[10] (E.g. Market agents will collect 8 ZMW for each box of tomatoes sold at 80 ZMW.)

In addition to collecting this agreed upon commission, some market agents will secure additional income by secretly skimming additional margins from each transaction. This practice, colloquially referred to as "kabende",[11] involves understating the sale price to farmers. Under this scheme a market agent might sell a box of tomatoes for 100 ZMW, but tell the farmer that it was sold at 80 ZMW. In doing so the market agent will collect a 10% commission of 8 ZMW, while also pocketing a 20 ZMW margin unbeknownst to the farmer. Many farmers believe this practice to be commonplace and it represents a substantial (if ultimately unknown) predatory transaction cost.[12]

The final service a market agent provides is to arrange transportation and packaging materials for farmers that cannot supply their own. For these farmers, the market agent will typically arrange for a truck to be sent with empty boxes and sacks to their farm for transport to Soweto. This service makes it easier for many farmers to access markets, but it also reduces their market choice and flexibility.

[7] Groups of underemployed young men that occasionally provide offloading services

[8] These cadres are widely understood to be under the employment / influence of market agents. By leveraging cadres as a method of enforcement market agents effectively run a small-scale protection racket to maintain their position.

[9] Sales activity typically begins around 5 A.M. and peaks in volume around 9 A.M. After 9 A.M. sales taper off but still continue throughout the afternoon.

[10] 10 percent is the average commission market agents collect for providing packaging material, security, and brokering services. This commission rate is negotiated individually and will be higher if the market agent provides additional services (providing seeds, inputs, and other in-kind loans).

[11] "Kabende" is a Bemba word for mortar. By constantly misrepresenting prices, market agents continually "beat" farmers as if with a mortar.

[12] One potential solution to this problem would be for farmers to query the buyers, rather than the market agents, to verify sales prices. By separating farmers from the buyers of their produce, market agents are able to create, and exploit, an asymmetry of information. While outside the scope of this research exercise, future iDE projects should explore methods of bridging this information gap to reduce kabende practices.

Table 1: Summary of Market Agent Role

Market Agent Pros	Market Agent Cons
• Provides security • Sells on behalf of farmer • Helps coordinate logistics of delivering produce to market • Provides farmers with packaging material • Can provide soft or in-kind loans to farmers with long-standing relationships	• Perceived by farmers to be connected to cadres – preventing independent sellers from entering market • Farmers pay market agents commission on each sale • Can embezzle farmer earnings via "Kabende margins"

Market Category 3: Peripheral Markets

In recent years smaller, peripheral markets have begun to develop within Lusaka. These medium-sized markets (see Figure 3) are located near urban compounds and other densely populated areas. While still limited in size, these markets have grown as a way for both farmers and vegetable retailers to circumvent Soweto market.

These peripheral markets offer a number of advantages to smallholder farmers. The first is the reduced power of market agents. While still present, market agents in the peripheral market typically sell for a flat rate (1-2 ZMW per box/sack) and farmers have the flexibility to sell on their own if they choose – making these markets more "open" and safe for new entrants. The second advantage is that the lack of market agent dominance, coupled with cheaper transport costs (many of these markets are closer to farmer catchment areas that Soweto), reduce farmer operating expenses. Even if the prices are equal between Mutendere (a peripheral market) and Soweto, a farmer selling in Mutendere will often take home more net profit.

Figure 5: Sellers in Mandevu Market

These markets, however, are still limited in their size and buying power. While more resistant to supply shocks than local markets, they are still susceptible to saturation and price volatility. Furthermore, farmers selling within these markets must provide their own transport and packaging material as these services are absent.

Table 2: Summary of Market Categories

Local Markets	Soweto Market	Peripheral Markets
+ Easy to Access + Low Operating Costs - Volatile prices - Limited purchasing power; markets can quickly become saturated	+ Largest market in Lusaka + High buying power + Access to packaging material and transport - Higher operating costs - Predatory market agents & high incidence of harassment	+ Fewer market agents; farmers can sell directly on their own + Reduced operating costs - Moderate buying power and risk of market saturation - Transport and packaging materials required but not provided

Cross-Cutting Theme: Packaging Material & Market Selection

Despite a variety of market options, farmers are often limited in which market they can sell because they lack their own packaging materials – specifically boxes. While vegetable sacks are cheap (~1 ZMW) and easy to acquire, boxes are more expensive (~10-12 ZMW) and are more difficult to transport and store when empty. Due to high maintenance and cost, most farmers choose to not invest in their own supply of boxes, and instead rely on borrowing boxes from neighbors or market agents.

Figure 6: Box Manufacturers in Soweto

This system of relying on market agents to supply boxes leads to a more efficient use of individual boxes, but severely limits farmer independence and market selection. The largest supply of boxes is manufactured and stored at Soweto market. For this reason, most farmers are also forced to sell in Soweto market because it is the only place they can source packaging material.

Summary of Farmer Challenges

Within this array of different market options, actors, and dynamics there are a number of challenges facing smallholder producers. These challenges include:

- **Price Volatility** – Market prices vary constantly by month, day, and time-of-day. Due to limited demand, markets quickly become saturated when there is unmatched supply.
- **High Operating Costs** – Transport, market levies, and market agent commissions represent high (and often predatory) costs to farmers.
- **Inability to select markets** - Lacking their own packaging material, many farmers are constrained to sell in select markets.

Intervention Design

Design & Activities

To address the challenges of price volatility, high operating costs, and market selection, iDE designed a pilot exercise whereby five FBAs in the Lusaka region (specifically Chongwe and Katuba – see Figure 3) were provided a supply of 50-100 boxes.[13] These boxes were provided to FBAs with the intention that they be rented to farmers in their catchment areas – either at a flat rate (~1-2 ZMW per box) or in conjunction with a market agent at one of the large markets.[14] By supporting FBAs in setting up this rental business, iDE hoped to:

- Support FBAs in generating additional revenue
- Assist farmers in accessing improved wholesale markets
- Provide farmers greater flexibility in selecting markets by increasing the supply of boxes not tied to any particular market

In addition to providing these FBAs with boxes, IDinsight designed a number of trainings related to harvest tracking, crop aggregation, transaction recording, and transport negotiation. (See Appendix 1.)

Key Questions

By providing FBAs with boxes and output marketing trainings, the pilot intended to test:

- Whether FBAs could earn a viable income from this activity
- How long it would take FBAs to recoup the initial box investment
- Whether farmers would realize higher net incomes from using FBA-provided boxes

Monitoring

Throughout the pilot IDInsight visited Chongwe and Katuba catchment areas every 1-2 weeks to track FBA transactions and farmer transactions. IDinsight also conducted qualitative interviews to ascertain market dynamics and gather impressions of pilot activities.

[13] The three FBAs in Chongwe received 100 boxes while the two FBAs in Katuba received 50 boxes due to differences in local production volumes.

[14] Under this scheme FBAs would split the typical 10% commission earned on the sale from the market agent

Findings

FBA Effects

FBAs were able to earn a small, but notable, income from the pilot (see Table 3). FBAs were given discretion to set their own rental prices based on perceived market conditions in their catchment area – with most charging 1 or 2 ZMW per box rental.

Table 3: Individual FBA Earnings

FBA Name	Box Supply	Number of recorded transactions	Number of rented boxes	Total Earnings (14 Jul – 1 Oct)
Roy Shumba	100	18	311	622
Songa Sitali	100	9	260	260
Caphus Mahongo	50	13	111	222
Collins Muchiya	100	6	166	205
Golden Muloongo	50	1	4	8

Among the five pilot FBAs, those that either owned 1) their own means of transport (Mr. Shumba and Mr. Mahongo) or 2) their own agro-shop (Mr. Sitali) were more successful in attracting customers. These individuals were already labeled as clear service providers within their communities and did not have to expend as much effort recruiting farmers. Mr. Muloongo and Mr. Muchiya, in contrast, frequently mentioned the challenge of having to walk long distances to reach their neighbors while also maintaining their own personal farms.

It should be noted that while some FBAs were rather successful, **none were able to recoup the initial cost of the boxes** (1000 ZMW) within the three-month period of the pilot. While some FBAs might have been able to reach this figure given more time,[15] it seems unlikely that most FBAs could repay this initial down payment within such a short timeframe.

At the outset of the pilot, FBAs were given the discretion to either rent boxes to farmers at a fixed rate, or to coordinate with a market agent in splitting a 10% sales commission. Nearly all FBAs opted to rent their boxes, stating that they could earn a higher income, that the logistics were simpler, and that farmers preferred having the flexibility to select their own market. One FBA did

[15] It is important to note that "peak harvest season" was delayed this year due to late spring rains. Peak production seemed to occur in late September – months later than forecasted. Furthermore, due to low-groundwater levels many farmers had to reduce their levels of production. These two effects – seasonality and water scarcity – likely depressed FBA earnings.

attempt to provide box-rental services in conjunction with a market agent (see Appendix 2, Transaction 31), however this required a fair amount of planning and coordination for relatively limited earnings.

Finally, one FBA (Mr. Sitali) stated that the pilot had allowed him to add additional farmers to his catchment area. By renting boxes, farmers began to view him as a "clear provider," and started purchasing other services (specifically inputs) from Mr. Sitali.

Farmer Effects

Among interviewed farmers, most cited improved market selection as the key benefit of the pilot. By renting boxes untied to any specific market, farmers could better react to market prices and could choose to sell in markets with reduced operating costs. Many of these farmers chose to sell in the peripheral markets of Mutendere and Mandevu, which they had previously been unable to access.

Table 4: Market Comparison

Market	Average Selling Price	Number of boxes sold in market	Gross Farmer Earnings (Total)	Operating Costs (Total)	Net Earnings (Total)	Ratio of Operating Costs to Gross Earnings	Per-box Operating Costs	Per-box Net Earnings (Average)
Katuba Local	**30**	2	60	4	56	**6.67%**	**2**	**28**
Chongwe Local	**37**	37	1233	335	898	**27.17%**	**9.05**	**24.27**
Mandevu	**43.5**	50	2361	471	1890	**19.95%**	**9.42**	**37.8**
Mutendere	**48.5**	382	18240	3924	14316	**21.51%**	**10.27**	**37.48**
Soweto	**37.86**	171	6855	1789	5066	**26.10%**	**10.46**	**29.63**

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Soweto	**37.86**	171	6855	1789	5066	**26.10%**	**10.46**	**29.63**

Table 4 summarizes all farmer transactions[16] recorded during the pilot (see Appendix 3) and highlights the differences between market options. Mandevu and Mutendere markets were the best overall market options, having both the highest average selling price and highest per-box net earnings.

One notable outcome was that some farmers that chose to still sell in Soweto market were able to negotiate reduced market agent commissions. Arguing that they were providing their own boxes, these farmers were able to pay commissions of only 5%, as opposed to the typical 10% fee. Due to this reduced commission, the per-box operating cost listed for Soweto in Table 4 is likely a suppressed figure, and would have likely been higher in the absence of FBA-provided boxes. Furthermore, the operating costs for Soweto market do not take into account any "Kabende margins" that would have been unknown to the farmer, further suppressing the figure.

Interviews with catchment area farmers indicated an overall positive attitude towards the box rental component the pilot program. Farmers appreciated the ability to independently select markets and the simplicity of renting boxes at a flat rate. Many stated a clear preference for selling in Mandevu and Mutendere markets due to higher prices, reduced operating costs,[17] and a lower incidence of harassment by cadres and market agents. Most interviewed farmers, however, preferred to handle market logistics themselves and almost none sought FBA assistance for crop aggregation or transport negotiation.

[16] All listed transactions refer to tomato sales

[17] These farmers stated that they *perceived* these peripheral markets to have reduced operating costs. Given the likely suppressed operating cost figure measured for Soweto market, it is difficult to fully validate this claim with certainty.

Recommendations

Given the success of the pilot program in generating FBA income and improving farmer market selection, IDinsight recommends that iDE **scale the pilot program to other FBA catchment areas.** While limited in size, the pilot was an overall success in boosting FBA income and also showed indications of benefiting catchment area farmers. With regards to any larger-scale implementation of this initiative, IDinsight specifically recommends:

- **Scaling the program in areas that meet the following conditions**:
  - Areas with multiple, decentralized market options
  - Areas where most farmers do not own their own packaging material
  - Areas with high operating costs that FBAs could play a role in mitigating
- **Facilitating FBAs to obtain an initial supply of boxes.** Loans could be risky as FBAs may not be able to repay a micro-finance loan within an acceptable time-period.
- **Facilitating FBAs to obtain other kinds of packaging materials.** Enabling FBAs to supply sacks and nets, in addition to boxes, could further consolidate their role as a source of services for farmers.
- **Prioritizing FBAs that own their own vehicles or agro-shops.** These FBAs are better positioned to incorporate output-marketing services within already existing business practices. FBAs that own vehicles are better positioned to provide useful services to farmers in their community. In addition to being able to deliver rented boxes to farmers, these FBAs can also act as transporters, source inputs and equipment from town centers, and access a wider catchment area of farmers.
- **Continuing to explore methods of reducing transport and other operating costs.** The pilot was successful in reducing market agent commissions primarily by improving market selection. It was not successful, however, in reducing transportation costs, which still represent a significant expense.
- **Supporting the growth of peripheral markets within Lusaka.** iDE should sensitize other FBAs and farmers about the benefits of these markets. Furthermore, these markets should be included in any future price-tracking (i.e. LimaLinks) or market-focused initiatives.

Appendix 1: FBA Training Materials

Crop Aggregation Tool

Note: *The worksheet below was distributed to FBAs to keep track of anticipated harvest dates & values for each of the farmers in their catchment area.*

FBA Name: _____

Crop: [Tomato, Rape, Cabbage, Impwa, Other: _____]

Crop Unit: [Boxes, kgs, sacks, Other: _____]

*The chart below can be used to help track the production of farmers that you work with. For the farmers in each row, write down an **estimate** of how many boxes / kgs / sacks of vegetable crop they will harvest. Each column can then be summed to give an estimate of how much produce can be sold each week.*

	Harvest Estimate					
Farmer Name	**Week 1**	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**
Date						
Total *Add up numbers in each column*						

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Transport Negotiation Tool

Note: *The worksheet below was distributed to FBAs to assist in calculating transportation costs and negotiating for fair transport prices. The second page includes fuel consumption for common vehicles and transport distances from FBA catchment areas.*

This tool can be used to help negotiate with transporters. You should first calculate what the **fuel costs** are for the transporter to get from your area to the market. Then you can calculate the transporter's profit based on the **cost-per-box** he/she charges you. From this you can calculate the transporter's profit.

Fuel Costs for Transporter

Distance to market (km)		*Fuel consumption for vehicle (kilometers per liter)*		*Cost of fuel (kwacha per liter)*		***Fuel costs for transporter***
	÷		X		=	

Cash paid to transporter

Cost per box		*Number of boxes*		***Cash paid to transporter***
	X		=	

Transporter Profit

Cash paid to transporter		*Fuel costs for transporter*		
	−		=	

Distance to Common Lusaka-Based Markets

Location	Destination	Market	Distance Round Trip (Km)		Travel time One Way (hr/min)
			One Way	*Round Trip*	
Chongwe (District Hospital)	Lusaka	Soweto	48	96	50 mins
		Mutendere	37	74	32 mins
		Bauleni	40	80	41 mins
		Mandevu	45	90	47 mins
	Kabwe	New Kasanda	180	360	2 hr 31 mins
Katuba (Roadside of Great North)	Lusaka	Soweto	36	72	46 mins
		Mutendere	41	82	50 mins
		Bauleni	47	94	1 hr 2 mins
		Mandevu	30	60	1 hr 22 mins
	Kabwe	New Kasanda	104	208	1 hr 17 mins

Average Fuel Consumption of Common Transport Vehicles

- Van – 10 Kilometers per liter
- Canter – 5 Kilometers per liter
- Fuso – 3.3 Kilometers per liter

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Transaction Logbook

Note: *The table below was distributed to FBAs to keep a log of all output-marketing transactions made with catchment area farmers.*

FBA Transactions						***Farmer Transactions***					
Date	**Farmer Name**	**Market boxes used in**	**# of boxes rented**	**Fee charged per box**	**Total FBA Earnings**	**Total number of boxes or sacks farmer sold in market**	**Price sold in market**	**Transport costs to farmer**	**Market agent commission paid by farmer *per box/sack***	**Market levy paid by farmer**	**Other costs to farmer**

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Appendix 2: FBA Transactions

Transaction ID	FBA Name	Transaction Date	Farmer Name	Crop type	Number of boxes rented to farmer by FBA	Per-box fee charged	FBA Earnings
1	Mahongo	9-Jul-15	Mashec Kabindama	Tomato	12	2	24
2	Sitali	10-Jul-15	Alfred Chipoya	Tomato	76	1	76
3	Sitali	10-Jul-15	Ignatius Chipoya	Tomato	40	1	40
4	Sitali	10-Jul-15	Martin Kabaleka	Tomato	28	1	28
5	Shumba	14-Jul-15	Gumbo	Tomato	20	2	40
6	Sitali	16-Jul-15	Ignatius Chipoya	Tomato	45	1	45
7	Sitali	16-Jul-15	Ignatius Chipoya	Tomato	33	1	33
8	Mahongo	24-Jul-15	Trust Mahongo	Tomato	6	2	12
9	Shumba	29-Jul-15	Mabwe	Tomato	33	2	66
10	Shumba	29-Jul-15	Mbuzi	Tomato	8	2	16
11	Mahongo	29-Jul-15	Mashec Kabindama	Tomato	5	2	10
12	Mahongo	30-Jul-15	Freijas Kacha	Tomato	2	2	4
13	Mahongo	3-Aug-15	Harison Cheenga	Tomato	12	2	24
14	Mahongo	3-Aug-15	Maagna Sibonda	Tomato	6	2	12
15	Muchiya	4-Aug-15	Green	Tomato	15	2	30
16	Muchiya	5-Aug-15	Thomas Mbewe	Tomato	11	0	0
17	Mahongo	10-Aug-15	Mashec Kabindama	Tomato	5	2	10
18	Mahongo	10-Aug-15	Trust Mahongo	Tomato	5	2	10
19	Sitali	13-Aug-15	Ignatius Chipoya	Tomato	8	1	8
20	Shumba	14-Aug-15	Malambo	Tomato	12	2	24
21	Sitali	14-Aug-15	Austin Mtuze	Tomato	3	1	3
22	Mahongo	16-Aug-15	Trust Mahongo	Tomato	4	2	8

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Transaction ID	FBA Name	Transaction Date	Farmer Name	Crop type	Number of boxes rented to farmer by FBA	Per-box fee charged	FBA Earnings
23	Shumba	17-Aug-15	Mabwe	Tomato	20	2	40
24	Mahongo	18-Aug-15	Harison Cheenga	Tomato	25	2	50
25	Mahongo	24-Aug-15	Kacha Fregias	Tomato	13	2	26
26	Shumba	25-Aug-15	Malambo	Tomato	20	2	40
27	Shumba	25-Aug-15	Mbuzi	Tomato	8	2	16
28	Mahongo	26-Aug-15	Lawrence Banda	Tomato	6	2	12
29	Mahongo	31-Aug-15	Kacha Fregias	Tomato	10	2	20
30	Shumba	1-Sep-15	Malambo	Tomato	10	2	20
31	Muchiya	2-Sep-15	Fabiano Kayumba	Tomato	40	1.125	45
32	Shumba	11-Sep-15	Mr. Sibanda	Tomato	12	2	24
33	Shumba	11-Sep-15	Mr. Malambo	Tomato	17	2	34
34	Muchiya	15-Sep-15	Mr. Green	Tomato	40	1	40
35	Shumba	17-Sep-15	Mr. Malambo	Tomato	10	2	20
36	Shumba	18-Sep-15	Mr. Sibanda	Tomato	15	2	30
37	Muchiya	18-Sep-15	Chanduba	Tomato	15	2	30
38	Sitali	18-Sep-15	Mwitwa	Tomato	16	1	16
39	Shumba	18-Sep-15	Malambo	Tomato	10	2	20
40	Shumba	18-Sep-15	Sibanda	Tomato	23	2	46
41	Shumba	20-Sep-15	Gumbo	Tomato	30	2	60
42	Sitali	21-Sep-15	Philemon Chitambala	Tomato	11	1	11
43	Muchiya	28-Sep-15	Makayamba	Tomato	45	1.33	60
44	Shumba	1-Oct-15	Malambo	Tomato	13	2	26
45	Shumba	1-Oct-15	Gumbo E	Tomato	27	2	54
46	Shumba	1-Oct-15	Sibanda	Tomato	23	2	46
47	Muloongo	1-Oct-15	N/A	Tomato	4	2	8

Appendix 3: Farmer Transactions

Note: *The transactions below are each linked (via the Transaction ID column) to an FBA Box Rental transaction in Appendix 2. For certain FBA transactions it was not possible to track farmer market outcomes.*

Trans-action ID	Farmer Name	Market Name	Crop type	Number of units[18] sold in market	Selling price per unit	Gross Farmer Earnings	Box rental fees	Total transport-ation costs	Market Agent Costs	Market Levy	Other costs	Total operating costs	Net Farmer Earnings
1	Mashec Kabindama	Mandevu	Tomato	12	60	720	24	72	12	0	0	108	612
3	Ignatius Chipoya	Soweto	Tomato	40	75	3000	40	280	150	0	0	470	2530
4	Martin Kabaleka	Mutendere	Tomato	28	55	1540	28	196	0	25	0	249	1291
5	Gumbo	Mutendere	Tomato	42	70	2940	40	336	84	25	0	485	2455
6	Ignatius Chipoya	Mutendere	Tomato	45	65	2925	45	315	0	25	0	385	2540
7	Ignatius Chipoya	Mutendere	Tomato	33	33	1089	33	231	0	25	0	289	800
8	Trust Mahongo	Mandevu	Tomato	6	46	276	12	36	12		0	60	216
9	Mabwe	Mutendere	Tomato	33	30	990	66	264	0	25	0	355	635
10	Mbuzi	Mutendere	Tomato	8	30	240	16	64	0	25	0	105	135
12	Freijas Kacha	Chibombo Local	Tomato	2	30	60	4	0	0		0	4	56
13	Harison Cheenga	Soweto	Tomato	30	30	900	24	180	60	0	0	264	636
14	Maagna Sibonda	Soweto	Tomato	6	30	180	12	36	12	0	0	60	120
15	Green	Chelston, Avondale, Kaunda Square	Tomato	15	75	1125	30	105	0	15	0	150	975
16	Thomas Mbewe	Mutendere & Soweto	Tomato	11	75	825	0	77	10	25	6	124	701

[18] Boxes or sacks

Trans-action ID	Farmer Name	Market Name	Crop type	Number of units sold in market	Selling price per unit	Gross Farmer Earnings	Box rental fees	Total transport-ation costs	Market Agent Costs	Market Levy	Other costs	Total operating costs	Net Farmer Earnings
17	Mashec Kabindama	Soweto	Tomato	15	25	375	10	90	15	0	0	115	260
18	Trust Mahongo	Mandevu	Tomato	5	25	125	10	30	5	0	0	45	80
19	Ignatius Chipoya	Chongwe	Tomato	8	45	360	8	70	0	10	0	88	272
20	Malambo	Chelstone	Tomato	12	45	540	24	96	0	25	0	145	395
21	Austin Mtuze	Chongwe	Tomato	3	45	135	3	21	0	10	0	34	101
22	Trust Mahongo	Mandevu	Tomato	4	30	120	8	24	4	0	0	36	84
23	Mabwe	Mutendere	Tomato	20	35	700	40	160	0	25	0	225	475
24	Harison Cheenga	Soweto	Tomato	30	30	900	50	180	60	0	0	290	610
25	Kacha Fregias	Mandevu	Tomato	13	40	520	26	78	26	0	0	130	390
26	Malambo	Mutendere	Tomato	20	37	740	40	0	0	50	70	160	580
27	Mbuzi	Mutendere	Tomato	8	37	296	16	72	0	12	0	100	196
28	Lawrence Banda	Mandevu	Tomato	10	60	600	12	60	20	0	0	92	508
29	Kacha Fregias	Soweto	Tomato	10	50	500	20	60	20	0	0	100	400
31	Fabiano Kayumba	Soweto	Tomato	40	25	1000	45	320	125	0	0	490	510
34	Mr. Green	Mutendere	Tomato	40	27	1080	40	320	20	30	0	410	670
37	Chanduba	Chongwe	Tomato	15	25	375	30	75	10	0	0	115	260
38	Mwitwa	District Government	Tomato	16	75	1200	16	120	0	0	0	136	1064
39	Malambo	Mutendere	Tomato	10	80	800	20	90	0	30	0	140	660
40	Sibanda	Mutendere	Tomato	20	80	1600	46	180	0	30	0	256	1344
41	Gumbo	Mutendere	Tomato	30	80	2400	60	140	0	30	0	230	2170
42	Philemon Chitambala	Chongwe	Tomato	11	33	363	11	77	0	10	0	98	265
43	Makayamba	Mutendere	Tomato	45	20	900	60	450	DK	25	0	535	365