Report on a Study to Crowdsource Farmgate Prices for Maize and Soybeans in Malawi

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Abstract
This report summarizes the findings from an innovative study to collect the prices that farmers received for maize and soybeans during the 2020 main marketing season in Malawi. Between April and July, whenever they sold maize or soybeans, farmers were asked to report the prices they received by calling or texting a toll-free number managed by Farm Radio Trust. Reported prices were then compared to the minimum farmgate prices set by the Ministry of Agriculture and Food Security. Our findings show that 75 percent of maize farmers and 90 percent of soybean farmers sold their crops below the official minimum farmgate prices. On average, prices received by these farmers were approximately three-quarters of official minimum farmgate prices.

1. Introduction
Since the early 2000s, Malawi’s Ministry of Agriculture and Food Security (MoAFS) has announced minimum farmgate prices for around 21 crops at the beginning of each agricultural season. These minimum farmgate prices are notionally based on small farmers’ typical costs of production and aim to protect farmers against extremely low prices. However, despite many anecdotal stories of traders offering farmers such low prices, consistent and accurate data on farmgate prices of agricultural commodities is scarce in Malawi: so, there is little hard evidence on whether minimum farmgate prices are enforced.

Crowdsourcing farmgate prices can augment the data on farmgate prices collected by MoAFS’ Agricultural Markets Information System (AMIS) at relatively low cost.\(^1\) Crowdsourcing is an innovative phone-based approach to collecting data on the price farmers receive. It relies on farmers reporting to a free phone call center the price and other attributes of their recent crop sales. To encourage

\(^1\) About 90 percent of the farmgate price data collected by the Ministry of Agriculture and Food Security Agricultural Market Information System (AMIS) has gaps with missing prices.
smallholder farmers to report their recent crop sales, an inducement is offered in the form of a chance to win a coupon for farm inputs in a weekly raffle. This facilitates the collection of robust, although self-reported, prices, which may be used to inform policy makers about the efficiency of agricultural markets and the effectiveness of price policies. Together with data on retail prices, such data can support the analysis of farm-retail margins and the competitiveness of alternative marketing arrangements. It can also help in examining the effects of the global COVID-19 pandemic, which has disrupted the global and national agri-food systems, with significant impacts on global food security, nutrition, and poverty (Arndt et al. 2020; Devereux, Béné, Hoddinott 2020; Laborde et al. 2020). In the longer term, better price information and more competitive farmgate prices are likely to stimulate increased production of many crops.

Most agricultural price monitoring in Malawi focuses on retail prices and, until now, only MoAFS through AMIS collects data on farmgate prices across the country. However, AMIS only collects farmgate prices over some time periods in selected years, which results in substantial data gaps. The only other source of farmgate prices is FAOSTAT (FAO 2020), a statistic web portal, managed by the Food and Agriculture Organization of the United Nations (FAO). Even though consistent farmgate price data is scarce in Malawi, available data from FAOSTAT show that the farmgate prices of maize and soybeans have fluctuated markedly over the years. Figure 1 presents farmgate price trends for maize and soybeans between 2013 and 2017.

Figure 1. Monthly average farmgate prices of maize and soybeans (2013–2017)

To close these data gaps, IFPRI crowdsourced the prices farmers receive for maize and soybeans during the 2020 main marketing season through the Farm Radio Trust (FRT) platform. Both crops play an important role in Malawi’s agriculture as a source of farm income and for their contribution to farm household food and nutrition security (Ochieng et al. 2020). The study drew on lessons from a pilot crowdsourcing study covering pigeon peas and chickpea prices in 13 districts in southern Malawi conducted between August and October 2019. The pilot study found that crowdsourcing is a cost-effective method to source farmgate prices in a timely manner and that most farmers sold their pigeon peas and chickpeas below the minimum farmgate prices.

The rest of the report is organized as follows. The next section describes the methodology employed in the study in terms of sampling procedure, data and analytical approaches. Section 3 presents and discusses the study findings while section 4 concludes with some policy implications.

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2 See Section 2 for further details. As far as the authors are aware, the crowdsourcing of farmer prices is set to applied in other countries.

3 It should be noted that the nominal producer prices reported by FAOSTAT are higher than AMIS prices for the same periods. In many instances, they were even higher than the average retail prices of the two crops collected by MoAFS.
2. Methodology

We employed a phone-based approach to crowdsource maize and soybean prices from farmers countrywide. To raise farmers’ awareness of this exercise, radio jingles (adverts) were aired four times a day at prime times by three major radio stations in Malawi (Malawi Broadcasting Corporation, Zodiak and Radio Livingstonia) asking farmers to report on their recent sales of maize and soybeans to a toll-free line. See Appendix 1 for the script of these radio jingles.

Data for this study were collected in two phases. The first phase involved crowdsourcing of the prices maize and soybean farmers received. To encourage farmers’ participation, callers were entered into a weekly draw and stood a chance of winning a coupon worth MWK 25,000 (approximately US$34). The winners could redeem the coupons at any store of a major agro-dealer (Agora/Farmers World) for agricultural inputs. This promotion and weekly draws lasted for four months (April–July 2020), with an additional grand draw during the last week of July, in which the winners received MWK 80,000 worth of coupons for agricultural inputs.

In addition to the sales prices, farmers who called the toll-free number were asked to provide information on their gender; volumes sold; type of buyer, location of sales; distances to and name of their nearest market. Farmers were also asked if and how the COVID-19 pandemic affected their maize and soybean marketing. See Appendix 2 for the checklist of questions that FRT call center operators asked farmers who called the free phone number.

In the second phase during August and September, a follow-up phone survey was conducted with those farmers who reported sales during the first phase of the study to better understand the marketing environment of the two commodities. Farmers were asked about their age; the size of their household and farm; area of the two crops cultivated; quantities harvested, sold and retained as seed; bargaining processes; quality assessment by both parties to the transactions; price expectations, awareness and usefulness of the minimum farmgate prices; and intra-household decision making on sales and use of sales proceeds. See Appendix 3 for the questionnaire used in the follow-up phone survey. Descriptive statistics, such as frequencies, percentages are presented in the following section.

Table 1 presents a summary of farmers calling-in during the four months of the harvest season and those who responded to a follow-up phone survey. A total of 2,313 farmers (1,048 for maize and 1,265 for soybeans) reported their sales by phone during April–July.4 A follow-up phone survey was conducted during August and September to better understand the marketing environment of the two commodities as detailed in the following discussion. In total, 850 of the maize farmers and 1,080 of the soybean farmers who reported prices between April and July were interviewed during the follow-up phone survey.

Table 1. Summary of surveyed maize and soybean farmers

| Category               | Initial callers | Follow-up phone survey |
|------------------------|-----------------|------------------------|
| Maize farmers          | 1,031           | 850                    |
| Soybean farmers        | 1,243           | 1,080                  |
| Total (excluding duplicate entries) | 2,274           | 1,930                  |
| Total (with duplicate entries) | 2,313           | 1,995                  |

Source: Crowdsourced data (April–August 2020).

4 A small number of farmers reported the same transaction multiple times, presumably to increase their chances of winning a coupon. These duplicate entries for both the initial calls and follow-up survey are excluded from our subsequent analysis.
Figure 2 shows the distribution of farmers by district. Most of the farmers were from the main maize and soybean producing districts in central Malawi, although prices were reported from farmers in 27 of Malawi’s 28 districts.\footnote{There were no callers from Likoma district, which comprises several remote islands in Lake Malawi. Likoma is not a major maize and soybean producing district.}

**Figure 2. Number of farmers reporting by district**

![Number of farmers reporting by district](image)

Source: Crowdsourced data (April – July 2020).

### 3. Study findings

This section presents the findings from both the initial calls from farmers and the follow-up phone surveys. We begin by presenting farmers’ profile (gender, age, farming experience and land holding) and the summary statistics of buyers of maize and soybean, crop transactions (volumes, prices, buyers, rounds of negotiation and relationship with buyers), and market characteristics (distance to markets, location of sales).

Table 2 presents the profile of maize and soybean farmers who reported crop sales during the crowdsourcing activity. Most of the farmers were men across both crop types (90 percent).

**Table 2. Gender of maize and soybean farmers responding (percentage)**

| Gender | Maize (N=850) | Soybeans (N=1,080) |
|--------|--------------|--------------------|
| Male   | 90           | 90                 |
| Female | 10           | 10                 |

Source: Crowdsourced data (April – July 2020).

Table 3 presents additional summary statistics of participating farmers. Both maize and soybean farmers were similar in terms of demographic profiles. On average, farmers were 36 years of age with about twelve years of experience in farming. The farmers were largely small-scale by orientation, owning an average of four acres of land and allocating two acres to maize and one to soybean production. The average quantity harvested was 2,167 kg (about 43 bags) for maize and 961 kg (19 bags) for soybeans. About 46 percent of harvested maize was sold while 7 percent retained for seed. In contrast, the commercialization rate for soybean was higher with 70 percent of the harvest...
sold and 7 percent retained for seed. The distance from farm to nearest main road (a proxy of access to transport) was 7 kilometers (km).

**Table 3. Summary statistics of maize and soybean farmers**

| Variable                        | Maize (N=850) | Mean | Std. Dev. | Soybeans (N=1,080) | Mean | Std. Dev. |
|---------------------------------|--------------|------|-----------|--------------------|------|-----------|
| Age of farmer (years)           |              | 36   | 11        | 36                 | 11   |           |
| Farming experience (years)      |              | 13   | 9         | 12                 | 9    |           |
| Farm size (acres)               |              | 4    | 3         | 4                  | 4    |           |
| Area under crop (acres)         |              | 2    | 2         | 1                  | 1    |           |
| Quantity harvested (kg)         |              | 2,167| 4,195     | 961                | 4,736|           |
| Quantity sold (kg)              |              | 1,000| 3,445     | 680                | 1,818|           |
| Quantity retained as seed (kg)  |              | 158  | 579       | 65                 | 136  |           |
| Distance to nearest main road (km) |          | 7    | 11        | 7                  | 12   |           |

**Note:** Kg = kilogram; km = kilometer.

**Source:** Crowdsourced data (April–July 2020).

Figure 3 presents a summary of buyers of maize and soybeans and the location of sale of the two crops. About 79 percent of maize and 89 percent of soybean farmers sold to assemblers or retailers. The second most common buyer was the Agricultural and Market Development Corporation⁶ (ADMARC) (19 percent of maize and 5 percent of soybean farmers). A few sales were made to other buyers such as consumers, farmers’ cooperatives and food and animal feed processors. In terms of location of sales, farmgate and market were the most common points of sale. Most of the maize sales were made at a nearby market or trading center (41 percent) closely followed by the farmgate (39 percent). However, most soybean sales were made at the farmgate (52 percent) followed by market or trading center. Sales to ADMARC and large traders were often made at their depots, which are spread across Malawi.

**Figure 3. Buyers of maize and soybeans and location of sales**

![Bar chart showing the percentage of farmers selling to various buyers and the location of sales for maize and soybeans.](image)

**Source:** Crowdsourced data (April–July 2020).

⁶ ADMARC is a parastatal corporation with an extensive depot network, which mandated to market most agricultural commodities in Malawi.
Table 4 shows the characteristics of maize and soybean transactions reported in the April–July period in terms of volumes traded. The upper part of the table presents the summaries for maize (Panel A) while the lower part presents the summaries for soybeans (Panel B). Interestingly, larger volumes of the two crops were sold to food and animal feed processors, large traders, and farmers cooperatives even though these categories of buyers were the least common. The largest average sales of maize and soybeans were 1.4 MT and 1.2 MT respectively to processors, and 4.4 MT and 0.9 MT to large traders, respectively. However, some individual transactions were as large as 10 MT for maize and 5 MT for soybeans (column 6). In contrast, some sales of just 10 or 20 kg were reported (column 5) for both crops. The modal volume of maize and soybeans sold was 500 kg (about ten 50 kg bags). Figure A1 in Appendix 4 presents the distribution of volumes sold by farmers, while Figure A2 shows plots of the variation of ask-offer prices over time in two major maize and soybean producing districts in central Malawi.

Table 4. Quantities of maize and soybeans sold by buyer type (in kg)

| Variable                  | Frequency | Mean  | Std. Dev. | Minimum | Maximum |
|---------------------------|-----------|-------|-----------|---------|---------|
| **Panel A: Maize**        |           |       |           |         |         |
| Assembler/retailer        | 667       | 751   | 1,251     | 10      | 10,000  |
| ADMARC                    | 159       | 612   | 616       | 20      | 3,000   |
| Processor                 | 13        | 1,381 | 2,626     | 150     | 10,000  |
| Consumer                  | 8         | 584   | 643       | 120     | 2,000   |
| Large trader              | 3         | 4,383 | 5,069     | 150     | 10,000  |
| **Panel B: Soybeans**     |           |       |           |         |         |
| Assembler/retailer        | 960       | 469   | 552       | 10      | 5,000   |
| ADMARC                    | 53        | 556   | 798       | 20      | 4,100   |
| Processor                 | 35        | 1,188 | 1,606     | 25      | 5,000   |
| Consumer                  | 5         | 215   | 86        | 75      | 300     |
| Large trader              | 23        | 906   | 1,241     | 20      | 5,000   |
| Farmers’ cooperative      | 4         | 763   | 304       | 500     | 1,050   |

Source: Crowdsourced data (April–July 2020).

Table 5 presents a summary of maize and soybean prices and transaction characteristics such as the reported average price/kg of the two crops, farmers’ ask and buyers’ offer prices, rounds of price negotiations, number of previous transactions with the buyer and number of buyers who visited the farm in the last seven days.
## Table 5. Maize and soybean prices and transaction characteristics

| Variable                                      | Mean | Std. Dev. | Minimum | Maximum |
|------------------------------------------------|------|-----------|---------|---------|
| **Panel A: Maize (N=850)**                    |      |           |         |         |
| Price (MWK/per kg)                            | 152  | 36        | 50      | 280     |
| Ask price (MWK/per kg)                        | 211  | 41        | 100     | 400     |
| Offer price (MWK/per kg)                      | 151  | 37        | 60      | 350     |
| Negotiation rounds                            | 1    | 1         | 0       | 9       |
| Frequency of previous trade                   | 2    | 2         | 0       | 10      |
| Number of buyers on farm                      | 3    | 4         | 0       | 52      |
| Farmers’ bargaining power (alpha)             | 0.02 | 0.12      | 0       | 1       |
| **Panel B: Soybeans (N=1,080)**               |      |           |         |         |
| Price (MWK/per kg)                            | 231  | 45        | 80      | 400     |
| Ask price (MWK/per kg)                        | 306  | 46        | 140     | 550     |
| Offer price (MWK/per kg)                      | 228  | 44        | 80      | 350     |
| Negotiation rounds                            | 2    | 1         | 0       | 7       |
| Frequency of previous trade                   | 2    | 2         | 0       | 10      |
| Number of buyers on farm                      | 3    | 4         | 0       | 50      |
| Farmers’ bargaining power (alpha)             | 0.04 | 0.16      | 0       | 1       |

**Note:** MWK = Malawi Kwacha; Kg = kilogram; Alpha (sales price-offer price/Ask price-offer price).

**Source:** Crowdsourced data (April–July 2020).

For maize (Panel A), the average price was MWK 152/kg with reported prices ranging between MWK 50/kg and MWK 280/kg. The modal (most common) price for maize was MWK 200/kg and for soybeans MWK 250/kg. Figure A1 in Appendix 4 presents the distribution of prices reported to the FRT call center. Strikingly, 75 percent of farmers sold below the official farmgate price of MWK 200/kg during the 2019/2020 marketing season (MoAFS 2020). On average, farmers asked for prices above the official farmgate price (MWK 211/kg) whereas buyers offered prices below the official price (MWK 151/kg). The average transaction involved one round of price negotiation with buyers before a price was agreed. In typical price negotiations, farmers propose a price (ask price) while buyers also propose a price they were willing to offer (offer price) and haggling continues until both parties settle for their reserve prices, which then becomes the final sales price.

On average, most sales were made to buyers who had transacted twice with the farmer on previous occasions. Visits to the farm by prospective buyers were limited to an average of three buyers in the seven days prior to the transaction. This is plausible given the market disruptions caused by the COVID-19 pandemic, which restricted trade in agricultural commodities during the study period (Aggarwal et al. 2020; Baulch, Botha, Pauw 2020; Chadza et al. 2020). We also calculated a simple measure of farmers’ bargaining power, which shows their commitment to the initial ask price (sales price-offer price/ask price-offer price). This measure shows that both maize and soybean farmers...
had weak bargaining power (alpha value tending to zero).\textsuperscript{7} About 95 percent of maize farmers accepted buyers’ initial offer price.

For soybean farmers (Panel B), the average sales price was MWK 231/kg with reported prices ranging between MWK 80/kg and MWK 400/kg. On average, farmers asked for prices above the official price while buyers offered prices below the official price. Again, 90 percent of farmers sold below the official farmgate price of MWK 300/kg during the 2019/2020 marketing season (MoAFS 2020). On average, soybean transactions involved two rounds of price negotiations before a price was agreed. Most sales were to buyers who on average had transacted twice with the farmer before. Visits to the farm by prospective buyers were limited to about three buyers in the seven days prior to the transaction. Soybean farmers also had weak bargaining power (alpha = 0.04) as about 89 percent ended up accepting buyers’ initial offer price.

As farmers’ offer prices will normally be influenced by future price expectations, farmers were asked whether they expected prices to remain the same, fall, or rise during the remainder of the marketing season (Figure 4). About 54 percent of maize and 35 percent of soybean farmers expected future prices to increase while less than 30 percent expected prices to fall. A further 31 percent of maize farmers and 39 percent of soybean farmers expected prices to remain the same during the rest of the season.

\textbf{Figure 4. Price expectations of farmers}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure4.png}
\caption{Price expectations of farmers}
\end{figure}

\textit{Source: Crowdsourced data (April–July 2020).}

Over 60 percent of maize and soybean farmers were aware that official minimum farmgate prices existed for the two crops (Figure 5). However, when asked to state the actual official minimum prices, seven percent of those who were aware of the prices cited incorrect figures. Furthermore, only about 67 percent considered them useful in their price negotiations with traders. This is an important finding as it points to possible widespread lack of awareness and enforcement of the official minimum farmgate prices and helps explain why traders’ offer prices were typically lower than the official prices (see Table 5).

\textsuperscript{7} See Ochieng and Baulch (forthcoming) for an econometric analysis of the determinants of farmer bargaining power and the ask-offer price spread.
Towards the end of the interview, call center operators asked farmers about decision making on crop sales and the use of sales proceeds. From Figure 6, 57 percent of both maize and soybean farmers decided on sales and use of sales proceeds jointly with their spouses while 35 percent mentioned unilateral decisions by household heads. Interestingly, despite extensive women involvement in the production of both crops, only about 7 percent of male farmers mentioned that the decision on the use of crop proceeds was made solely by their spouses.

As a wrap up question, farmers were asked about the use of crop sales proceeds and the summary is presented in Table 6. More than half of the farmers used the income from maize and soybean sales to pay for farm labor (ganyu) and other farm inputs such as seeds, fertilizers and other crop chemicals (56 percent and 54 percent of maize and soybean farmers respectively). Other major uses of sales proceeds included payments of household expenses, food and school fees and related expenses as cited by at least 10 percent of the farmers. This finding is plausible given that Ochieng et al. (2019) found that farmers make ‘distress sales’ at the peak of the main harvest marketing or lean seasons to meet pressing cash needs. In Malawi, school fee payments coincide with the peaks of the lean seasons and thus lead to distress sales (Dillon 2017).
Table 6. Use of sales proceeds (in %)

| Uses of sales proceeds                | Maize (N=850) | Soybeans (N=1,080) |
|---------------------------------------|---------------|--------------------|
| Pay for farm labor/inputs             | 56            | 54                 |
| Pay for household expenses            | 14            | 12                 |
| Purchase food                         | 11            | 13                 |
| Pay school fees and related expenses  | 10            | 11                 |
| House construction/improvement        | 4             | 3                  |
| Purchase livestock                    | 1             | 2                  |
| Pay medical expenses                  | 2             | 2                  |
| Purchase assets                       | 1             | 1                  |
| Repay loans                           | 1             | 1                  |
| Start a business                      | 1             | 1                  |
| Save the proceeds                     | 1             | 0                  |

**Source:** Follow-up phone interviews with farmers (August–September 2020).

4. Conclusion

This study used an innovative call center-based method to crowdsource the prices that Malawian maize and soybeans farmers received during the 2020 marketing season. Through phone calls with farmers who responded to radio jingles, we established that most maize and soybeans were sold either on farm (39 percent for maize and 52 percent for soybean) or at nearby markets (41 percent for both crops), and were mainly sold to assemblers and retailers. A small number of farmers sold directly to consumers. Most sellers (90 percent) were male and two-thirds (64 percent) came from the central region of Malawi, which contains country’s principal maize and soybean producing districts. However, sales prices were reported from all districts in Malawi except Likoma.

About 75 percent of maize farmers and 90 percent of soybean farmers sold their crops below the official minimum farmgate prices of MWK 200/kg for maize and MWK 300/kg for soybeans. On average, prices received by these farmers were approximately three-quarters of official minimum farmgate prices. While about two-thirds of farmers were aware of official minimum farmgate prices, many of them could not state these prices accurately. Furthermore, about one-third of those who were aware of minimum farmgate prices did not find them useful when negotiating prices with buyers. Overall, farmers had weak bargaining power vis-à-vis buyers.

These findings point to a widespread lack of awareness and enforcement of minimum farmgate prices, and therefore their limited usefulness in raising prices farmers receive for their crops. Previous studies show that, while costly and informal, agricultural markets in Malawi are broadly efficient (Sitko and Jayne 2014). Therefore, rather than calling for stricter enforcement of minimum prices, we suggest encouraging greater competition at all levels of the market chain. This can be a more effective way to ensure that farmers receive better prices.

The results of this study are in line with findings from an earlier crowdsourcing study for pigeon peas and chickpeas in southern Malawi between August and October 2019 (Ochieng 2019). Both studies confirm that official minimum farmgate prices are weakly enforced and are therefore ineffective in guaranteeing minimum prices to farmers.
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REFERENCES

Aggarwal, S., D. Jeong, N. Kumar, S.D. Park, R. Robinson, and A. Spearot. 2020. The Impact of COVID-19 Market Disruptions on Food Insecure Households in Rural Liberia and Malawi. Mimeo. Indian School of Business, University of California Santa Cruz, and World Bank.

Arndt, C., R. Davies, S. Gabriel, L. Harris, K. Makrelov, S. Robinson, S. Levy, W. Simbanegavi, D. van Seventer, and L. Anderson. 2020. “Covid-19 Lockdowns, Income Distribution, and Food Security: An Analysis for South Africa.” Global Food Security 26: p.100410. https://doi.org/10.1016/j.gfs.2020.100410

Baulch, B., R. Botha, and K. Pauw. 2020. Short-Term Impacts of COVID-19 on the Malawian Economy: Initial Results. MaSSP Report. Lilongwe: Malawi. International Food Policy Research Institute. https://doi.org/10.2499/p15738coll2.133788

Chadza, W., W. Burke, C. Nyondo, M. Khonje, M. Munthali, Z. Nyirenda, M. Muyanga, and T. S. Jayne. 2020 An Early Assessment of the Impact of COVID-19 in Malawi. MwAPATA Institute Working Paper No. 20/05. Lilongwe: Malawi.

Devereux, S., C. Béné, and J. Hoddinott. 2020. “Conceptualising COVID-19’s Impacts on Household Food Security.” Food Security 12: 769–772. https://doi.org/10.1007/s12571-020-01085-0

Dillon, B. 2017. Selling Crops Early to Pay for School: A Large-Scale Natural Experiment in Malawi. https://dx.doi.org/10.2139/ssrn.2848003

FAO (Food and Agriculture Organization of the United Nations). 2020. FAOSTAT database. Accessed September 4, 2020. http://faostat.fao.org.

Laborde, D., W. Martin, J. Swinnen, and R. Vos. 2020. “COVID-19 Risks to Global Food Security.” Science 369 (6503): 500–502. https://doi.org/10.1126/science.abc4765

MoAFS (Ministry of Agriculture and Food Security). 2020. 2019/2020 Minimum Farmgate Prices for Selected Agricultural Commodities, as of 7 April 2020. Food Security Unit, Ministry of Agriculture and Food Security, Lilongwe.

Ochieng, D. O. 2019. Report on a Pilot Study to Crowdsource Farmgate Prices for Legumes in Southern Malawi. Lilongwe, Malawi: International Food Policy Research Institute (IFPRI). https://doi.org/10.2499/p15738coll2.133569

Ochieng, D.O. and B. Baulch. Forthcoming. “Farmer-buyer Bargaining Power and Price Determination: Insights from Crowdsourced Crop Transactions.” Presentation at the annual virtual meeting of RISE, Research Day, Washington, DC.

Ochieng, D. O., R. Botha, and B. Baulch. 2019. Structure, Conduct and Performance of Maize Markets in Malawi. MaSSP Working Paper 29. Lilongwe: Malawi. International Food Policy Research Institute. https://doi.org/10.2499/p15738coll2.133375

———. 2020. Market Information and Access to Structured Markets by Small Farmers and Traders: Evidence from an Action Research Experiment in Central Malawi. MaSSP Working Paper 33. Lilongwe: Malawi. International Food Policy Research Institute. https://doi.org/10.2499/p15738coll2.133649

Sitko, N.J. and Jayne, T.S. 2014. “Exploitative Briefcase Businessmen, Parasites, and Other Myths and Legends: Assembly Traders and the Performance of Maize Markets in Eastern and Southern Africa.” World Development 54: 56–67. https://doi.org/10.1016/j.worlddev.2013.07.008
APPENDIXES

Appendix 1. Crowdsourcing radio jingle

| Radio Jingle/Promo | Chichewa |
|-------------------|----------|
| Farmers who grew maize/soya in this growing season, have you already sold your produce? Where did you sell? How much did you sell your produce for? Tell us by calling 8111 on Airtel toll free line. You will automatically join a raffle draw and stand a chance to win a voucher of farm inputs worth MWK25,000 from Agora and Farmers Worlds shops. Every week, 6 lucky callers will stand a chance to win this voucher. This raffle draw runs up to July 31, 2020. Remember to call 8111 on Airtel toll free line to enter the raffle draw. Terms and conditions apply. |
| This message is brought to you by Farm Radio Trust in collaboration with IFPRI. |
| Kodi alimi amene munalia chimanga/chingoma kapena soya, mwagulitsa kale? Mwagulitsa kuti? Nanga mwagulitsa ndalama zingati. Tiuzeni poimba phone mwaulere ndi airtel pa 8111 ndipo mulankhula ndi alangizi. Mukatero, ndiye kuti mwalowa mu mpikisano umene alimi 6 amphumi sabata iloyonse azipasidwa vocha ya K25,000 kwacha yogulira kaundu wa Ulimi m'ma shop a Agora ndi Farmers World. Mpikisanowo ulipo mpaka July 31, 2020. Kumbukirani kuyimba phone pa 8111 pa nambala za airtel mwaulere kuti mulowu mu mpikisanowo. Ndozomeko za mpikisanowo zizatsatidwa. Akupatsanirani utengau ndi a Farm Radio Trust mogwirizana ndi IFPRI |

Appendix 2: Call center checklist

MODULE A: Basic information

Name: 

Gender: 

District: 

Village: 

MODULE B: Crop marketing 

i. Crop sold: Maize_________ Soya_________ 

ii. From which season? 1. This season 2. Previous season 3. Other seasons 

iii. Quantity sold (in kgs) ____________ 

iv. Price per kg ___________ 

v. Initial price suggested by farmer per KG ____________ 

vi. Initial price suggested by buyer per KG ____________ 

vii. Category of buyer 1. Vendor 2. Manufacturer/processor 3. consumer 

viii. Location of transaction ____________ 

ix. Name of nearest market______________ 

x. How long do you walk to nearest market? (Minutes) 

xi. How did you know about the promotion? 

xii. Has COVID-19 affected your maize/soybean sales? 1=yes 2=No 

xiii. How has COVID-19 affected your maize/soybean sales?
Appendix 3: Follow-up questionnaire

MODULE A: Basic information

Age (or year born):

Education level (years of schooling):

Farming experience (years):

Distance from the home to the nearest main road (kilometer):_____

Farm size (acres):

Acreage under this crop in the last season? maize ___ soya ___

Quantity harvested of this crop (in kg) maize ____ soya _____

Quantity sold of this crop (in kg) maize ____ soya _____

Quantity set aside as seed (in kg) maize ____ soya _____

MODULE B: Crop marketing [ONLY ASK ABOUT THE SALES FARMERS REPORTED INITIALLY AND NOT WHAT THEY HAVE SOLD AFTER THAT]

1. For the maize/soya you sold, who proposed a price first? 1. Farmer 2. Buyer
2. What was your last known price of maize/soya before this sale?____
3. How many times did you haggle over price with the buyer?____
4. Did the buyer agree with your assessment of the quality of maize? And of soya? 1. Yes 2. No
5. How do you expect the price to behave this season? 1. Remain stable 2. Increase 3. Reduce
6. Are you aware of minimum farmgate prices for maize/soya? 1=yes 2=No
7. If yes, what is the minimum farmgate price for maize ___soya___?
8. Is the minimum farmgate price useful in setting your sales price? 1=yes 2=No
9. Who makes decision on maize/soya sales?
   i) Household head
   ii) Spouse
   iii) Joint decision between household head and spouse
   iv) Another adult household member
10. What did you spend most of the sales proceeds on? [Tick two most important]
    i) To pay school fees and other related expenses
    ii) To purchase farm inputs
    iii) To purchase farm inputs
    iv) To purchase food
    v) To pay medical expenses
    vi) To pay for household expenses
    vii) Other…
Appendix 4: Supplementary graphs

**Figure A 1.** Distribution of sales volume of maize and soybeans

Source: Crowdsourcing data (April–July 2020).

**Figure A 2.** Ask-offer price spreads and final sales prices in two districts

Source: Crowdsourcing data (April–July 2020).
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