

INCREASING KENYA HOME GROWN SCHOOL MEALS PROGRAMME EFFICIENCY THROUGH MOBILE PHONE TECHNOLOGY

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Context

Implemented by the Ministry of Education, the Home Grown School Meals (HGSM) programme first began in 2009 as part of a broader strategy to transition school feeding to government ownership and implementation. After 30 years of a regular school meals programme, World Food Programme reduced their school feeding case load from 1.2 million to 770,500 beneficiaries in 2009 due to increased commodity and transport costs. In light of the reduced coverage by WFP and prevailing food insecurity the Government of Kenya responded by launching, in July 2009, the HGSM programme which had a beneficiary level of 538,000 children in 1,777 schools in 66 semi-arid districts. This launch demonstrated the government's commitment to school feeding. In 2015, the programme had reached a beneficiary level of 900,000 children in approximately 3,850 schools in 38 semi-arid districts in the country, with a very clear commitment from the government for continued delivery. Currently, the HGSM programme targets primary schools situated in semi-arid lands that experience low enrolment, high drop-out and low completion rates, where pupils experience short-term hunger and subsequent difficulty concentrating on what is taught.

HGSM has the following objectives:

1. To improve school enrolment, attendance, transition, retention and learning capacity.
2. To promote equity by supporting access to quality education and nutrition with special emphasis on girls, orphans and vulnerable children in arid and semi-arid lands, pockets of poverty and other marginalized areas.
3. To strengthen mechanisms for sustainability of SHN (School Health and Nutrition) programmes.
4. To provide a market for local smallholders, through which they can sell their farm produce to spur agricultural growth and foster food security.
5. To promote skills-based health, hygiene and nutrition education that supports the development of knowledge, attitudes, values and life skills for healthy and hygienic behaviours.
6. To strengthen the capacity of stakeholders at all levels to implement SHN programmes.
7. To have a framework to regulate, co-ordinate and ensure standards in implementation of SHN programmes.
8. To enhance a comprehensive, effective, efficient and sustainable monitoring and evaluation

(M&E) system.

Kenya operates a decentralised school feeding programme, empowering communities and schools to meet the nutrition needs of their primary school students through structure demand. Within this system schools take responsibility for the sourcing, procurement, preparation and provision of school meals for students, with head teachers providing management and oversight. Through open tendering smallholders, brokers and traders submit blind bids to schools. By procuring locally in such a manner it is anticipated that school feeding drives agriculture opportunities of smallholders and market systems in general as well as nutritional and educational benefits of primary school children.

The Kenya HGSM programme has been a longstanding leader in implementing locally sourced school meals, with an adopted procurement mechanism that brings market opportunities to communities. However, the degree to which smallholders exploit such opportunities is very much dependent upon their level of market awareness as well as their ability to supply the desired quantities and quality of commodities.

In response to this, mobile phone technology has been piloted as a means by which the school feeding market can better serve smallholders through increased information exchange, collaboration opportunities and healthier market competition. For the Ministry of Education, the custodian of the programme, the Mobile Phone Platform (MPP) stands to generate information that massively enriches the ongoing HGSM monitoring and evaluation processes. Not only does this result in efficient use of public funds, the MPP can act as a barometer indicating the market dynamics at community level, informing relevant ministries and stakeholders of smallholder and Farmer Based Organisation (FBO) behaviour and shortfalls.

The MPP aims to promote objectives 3, 4, 6, 7 & 8.

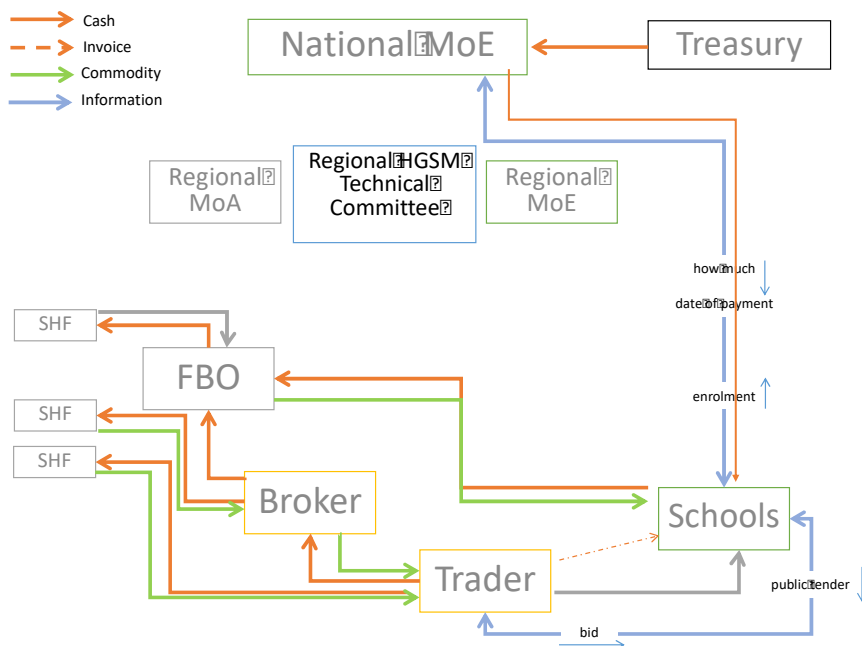
Current procurement model

Procurement of the HGSM programme is undertaken at school level and coordinated by the School Meals Programme Committee (SMPC). Similar to the procurement of education materials, each school is allocated an amount of money from the national treasury, received by the school bank account on a biannual basis. Thereafter, each school engages in a competitive tendering process through public announcements for each of the three terms of the school year.

Suppliers must qualify under the following criteria;

- Hold a trading license and bank account
- Present more than three years of trading experience
- Be able to accommodate the entire school commodity requirements in a single trade

See diagram below;



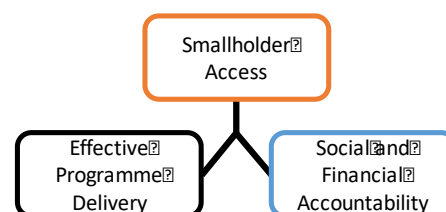
Problem statement

User perceptions of the existing HGSM programme procurement system were gathered through consultation with relevant Ministry respondents, school teachers, FBO leaders, traders and smallholders over a period of 6 months. This approach aimed to map out the issues being faced by users and the tangible benefits the MPP would strive to achieve. A summary of those discussions are given below and arranged by the key sectors of agriculture and education.

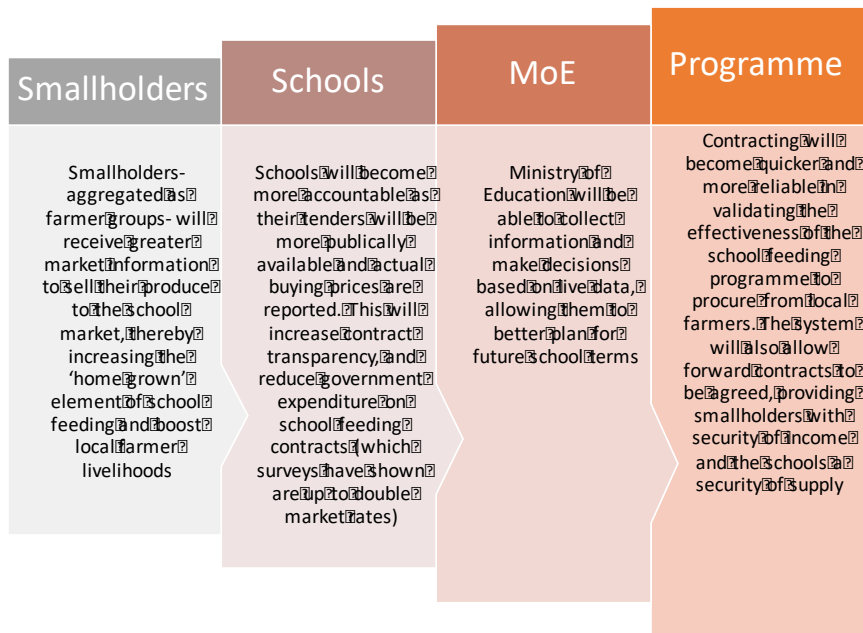
Agriculture	Ministry of Agriculture	County Ministry of Agriculture	Farmer Based Organisation (FBO)	Smallholder Farmer
Observed inefficiency	Limited school feeding market knowledge and access by smallholders	Limited understanding of market dynamics and smallholder and FBO barriers to entry for the school feeding market	Lack of information on tenders being issued, barriers in responding to tenders	Limited market access and household income
MPP Solution	Widened and more open tendering process, allowing target agricultural groups to benefit the school feeding market	Greater information on market prices, actors and the smallholder/FBO's capacity development needs	Automated tendering system ensuring timely notification for smallholder/FBO, with easy response mechanism for FBOs	Increased income through sales directly between FBO's and the HGSM

Education	Ministry of Education	County Ministry of Education	Schools
Observed inefficiency	Limited competition in the school feeding market, resulting in sole sourcing	Foreseen complex oversight and administrative burden on county officials	Complex and paper heavy administrative process
MPP Solution	Widened and more open tendering process, resulting in more competitive buying prices and procurement transparency	Automated reporting able to consolidate information and provide alerts to administrators, greatly reducing administrative burden	Automated reporting with easy user interface to reduce school administrator burden when both issuing tenders and receiving commodities

It must be emphasised that the application of automated buying for school feeding is not only applicable to the HGSM programme in Kenya. Globally, smallholder access to the school feeding market and quality cost-effective school feeding delivery are not an easy partnership to facilitate. In the first instance, scattered smallholders need markets for their commodities, which are often disaggregated, of inconsistent quality, available at varying distances and times, and without means of financial transaction outside the cash economy. On the other hand, effective school feeding programmes require efficient timely delivery of commodities, at consistent quality and quantity, and with means of transparent and accountable financial payment. This ubiquitous tension is best observed and understood as acting between: smallholder access; social and financial accountability; and effective programme delivery.

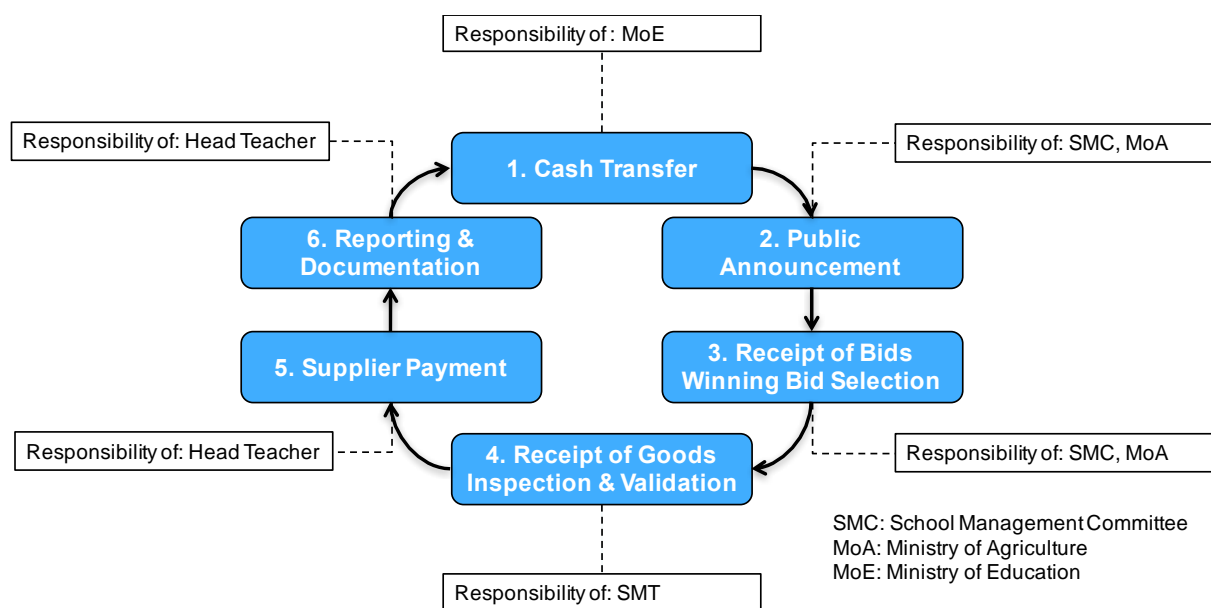


For this reason, and by demonstration of the MPP reducing observed inefficiencies and tensions within the school feeding ecosystem, the outcome of this pilot stands to have a far reaching impact. The below diagram presents the foreseen benefits of the MPP system for stakeholders within school feeding.



MPP process description

The piloted MPP is currently at early stages of development, where the design does not address all functions within the existing HGSM programme procurement and reporting cycle, represented below. Instead, the MPP only addresses activities 2 & 3. As user experience and uptake are critical to the future of automated buying for the HGSM programme, and given the limited budget available for software development, attention was given to this specific area of user acceptance. Simply understanding whether smallholders, FBO's and traders are willing to engage in a new system requiring technology adoption, which is very different to local buying practices and the existing HGSM programme procurement mechanism, would provide justification for further investment.



In rolling out the pilot the following phases were completed by stakeholders: Registration; Training; Generating Tender Requests; Bids and Feedback; and Transaction Completion.

Registration was firstly required by all schools, smallholders, FBO's and traders wishing to receive tender alerts. Recognising the MPP is not intended to create a protected market only consisting of smallholders and FBO's, the consultative design process highlighted the legal and programmatic need to include all market actors. By doing so, it is suggested the system has greater potential to achieve programme efficiency and sustainability for the Ministry of Education, while offering a viable tendering mechanism for the entire HGSM programme. A total of 48 school teachers, 2,000 smallholders, 9 FBO's and 10 traders registered with the MPP.

Training was provided to all teachers, smallholders, FBO leaders and traders. This included how tender requests would be transmitted to each stakeholder through mobile phone text, what information would be included within the text and how stakeholders should respond with text bids.

Generating Tender Requests remained the responsibility of the school management committee, with publishing of request for tenders via text performed by senior teachers. The quantity and delivery date expectations of commodities are determined by schools based on school population size and carry-over stock from the previous term. Texts are subsequently sent to recipient smallholders, FBO's and traders including commodity type, amount, location of delivery and response deadline.



Bids and Feedback were both provided by the MPP system, where FBO's and traders submit bids and receive decision outcomes via text. Smallholders do not generally have production capabilities to meet the entire tender requirements of schools in addition to the standard entry qualifications, hence FBO's are expected to present offers on behalf of aggregated smallholders.

Transaction Completion was achieved after the commodities had been received and accepted by the school, whereby the quantity and quality of commodities are inspected and approved. Transaction and payment of suppliers have not been integrated into the current version of the MPP, where subsequent decision and payment were made by schools through its School Management Committee, account and standard paper process. Although automating this stage is envisioned for the next generation of MPP.

Pilot highlights

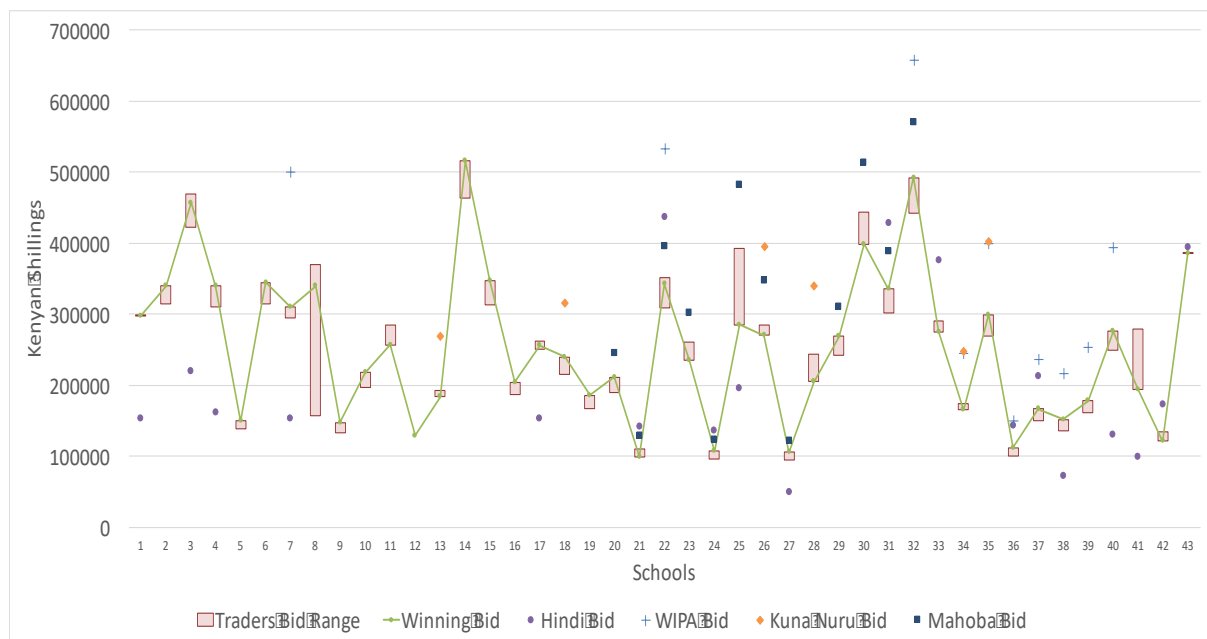
In collaboration with the Ministry of Education, Ministry of Agriculture and County Administration Offices of Kilifi County, the MPP was trialled with 48 schools in the Kilifi and Ganze districts of Eastern Kenya. The MPP was fairly provided to all potential suppliers, including traders, smallholders and FBO's, in an attempt to increase market efficiency and access to all. Efforts were made to avoid any form of protectionism or biases toward a particular group of suppliers, despite the programmes target beneficiary being smallholders' as members of participating FBO's. Findings include;

- 427 individual bids were made through the MPP by traders and FBO's
- 45 trades were completed
- A total of 157 MT of dried maize and beans were procured through the MPP
- Participating testimonials include:
 - o Observed market efficiency increases

- Opportunities for aggregation and coordinated selling,
- Increased transparency
- Reduced administrative burden and transaction costs
- Desire to see the MPP further developed
- Opportunities for scale-up to other schools and markets

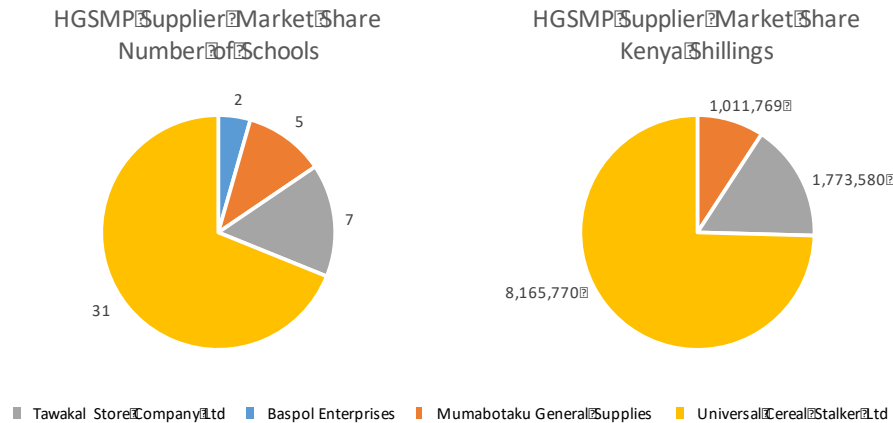
Findings

Pricing: By considering the entire spread of bids received by schools from all suppliers, it is clear that FBO's lack competent pricing strategies. The diagram below shows bids received by schools, with red vertical bars that include all bids received by traders as a cluster, and marker points (dots) that show the offerings of FBO's. Immediately it can be seen that FBO's failed to place bids within the range of trader offers, where, in most cases, traders maintained bids within a close range. Hence traders are generally aware of market prices, knowing competitive rates to bid at, while FBO's are wildly uncompetitive.



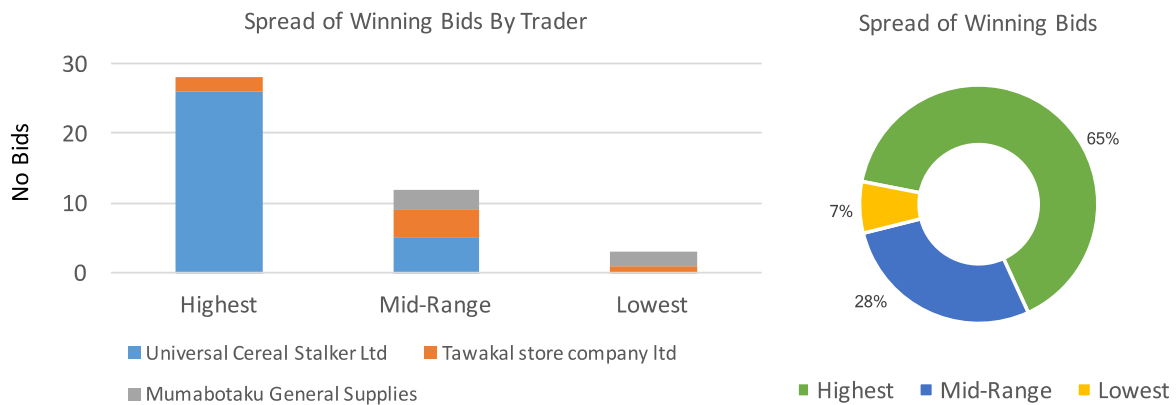
During focus group discussions it had been suggested traders purposely bid low prices, however without additional wider market data from other buyers similar to schools, this is difficult to validate. Although consistent price trends between traders would suggest a competitive market, especially as collusion amongst all traders required to keep offerings close together but below market rates is not considered likely.

Market Share: The most striking observation from the data includes the rate at which individual suppliers won bids, with one particular supplier consuming 68% of the schools and in cash terms 75% of the total school feeding market within the pilot. Although the justification given by schools included previous positive experience working with this particular supplier, it does underline the limited spread of the school feeding market across potential suppliers.



As the experience of the supplier is considered within the vetting process of bids, this may present a continual stumbling block for FBO's. So much so, consideration might be required by the Ministry of Education as to the ongoing inclusion of this criteria in future bids. Other possibilities may include setting a maximum number of schools per supplier, to prevent market domination by one supplier as witnessed during this pilot exercise.

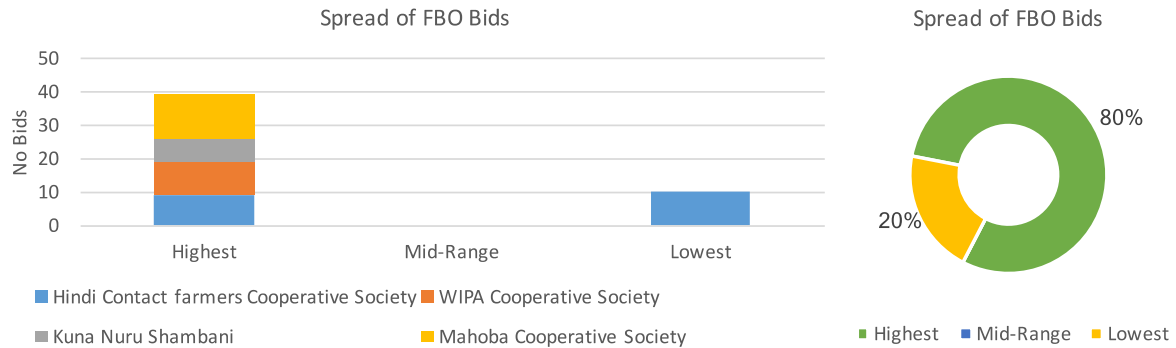
Spread of bids by winning supplier: When FBO bids are removed from the data, as their pricing strategies are incoherent with the market, a very clear trend emerges between the trader's bids and winning offers. The graphs below show how the winning bids are most frequently the highest prices offered by traders at 68%, suggesting schools are not driven as strongly by price over other qualification criteria such as experience and reputation.



This again presents a significant barrier to entry for FBO's, as building the reputation and experience with schools will not be achieved until FBO's actually complete sales to such buyers. Tours of FBO facilities and discussions with FBO management and members could be a solution. Through a structured review of FBO capacity, in partnership with the Ministry of Agriculture and Development Partners, an accurate evaluation can be made by school procurement teams, which is not dependent on experience and supplier reputation. However, this should not undermine the due diligence processes of schools, with the quality of commodities and need for timely delivery required equally of FBO's and traders.

Spread of Bids by FBO: The graph below shows FBO bids in relation to all bids, where a clear trend of over and under pitching exists. This brings further understanding to the FBO's limited capacity to offer

competitive prices, as in every case FBO offers were either the highest or lowest amongst all bids received by a school. FBO's failed to bid within the mid-range of offerings. 3 out of the 4 tendering FBO's repeatedly made offers in excess of the market, effectively pricing themselves out of contention, whereas 1 FBO made offerings either too high or too low to be considered a serious offer.



Overall, 80% of all FBO offerings were far higher than the remainder of the school feeding market. Responses of the focus group participants suggested FBO's were intentionally bidding far higher than acceptable market rates, believing they would receive favourable treatment given the HGSM programme's objectives of supporting smallholders. With this in mind, it further reinforces the absolute necessity for the school feeding market to remain competitive, therefore clear communication to all market participants should emphasise competitiveness as well as access.

Participant perceptions

To understand the user experience of all stakeholders involved in piloting the MPP, focus group discussions were undertaken with groups of school teachers, traders, FBO leaders and smallholders. The findings of which are blended under the following headings.

Market Awareness by traders, smallholders and FBO's had been present since before the MPP was launched. Traders had previously sold to target schools, similarly to FBO's, or had been included in match-making events and market awareness exercises by government and technical development partners, such as PCD and SNV. However, the MPP system would give instantaneous market information previously unavailable, thereby allowing sellers to know when the market was open and closed. MPP training also highlighted the true extent and opportunity of the HGSM programme market for sellers.

Market Access was described by FBOs and traders as being enhanced by the MPP. One trader cited transaction costs of Kes500 (\$4.92 USD) being incurred during registration, although this wasn't experienced by smallholders or FBO's. Traders were unanimous in lauding the simplicity of the MPP system allowing easier market entry, although smallholders seemed to require significant support from their respective FBO representatives. The issue of schools requiring a large minimum sale quantity, a frequent barrier to entry for small firms, was overcome by both traders and FBO's through coordination between suppliers, allowing more than one supplier to respond to a single tender. Overall, traders and FBO's congratulated the ease with which the MPP system can be used.

Market Information provided by the MPP included critical information that the traders felt improved the accuracy of their bids. Although the information did not change from the previous tendering system employed by schools, the text facility meant information was easily managed and understood by recipient suppliers. Traders and FBO's were critical that texts were received by bidders at different times, with FBO's stating they struggled to submit bids through the system resulting in late bid submission. It is unclear whether these issues were a consequence of intermittent network coverage or MPP system failure. Most significantly, traders and FBO's were inaccurately informed of winning bids, with some suppliers being awarded a contract which was later rescinded. Traders explained they did not receive explanation of why bids failed, limiting their learning potential, which differed greatly from FBO's who were informed their bid had failed. This feedback process is however not automated as yet and needs to be a key improvement in this system moving forward.

Competition and Transparency stands to be enhanced by the MPP, given that traders reflected upon the potential to increase competition. Traders suggested buying prices were moderate, although at this early point and given the blind bidding nature of the MPP system, any real price influence by the MPP is unlikely at this point. Despite this, teachers proposed traders had purposely quoted low prices to undermine FBO competition, although this is difficult to qualify given the available data. FBO's continually priced their bids very poorly, with feedback from focus group discussions suggesting they were encouraged to bid high. Additional gestures by traders, such as fumigation of school stores, were given by traders as justification for winning bids. This, however, is outside the requested services and could be construed as uncompetitive behaviour. Traders had felt the procurement process had been influenced unfairly by some Ministry of Education officials, citing intimidation of head teachers to choose particular suppliers. Similarly, highly successful traders were accused by other suppliers of collusion with schools, given the disproportionate number of contracts awarded to individual suppliers.

Transaction Period and Administration had both improved, as experienced by traders, FBO's and teachers. Particular reference was given to the reduced timeframe of tendering to supplying of goods, and reduced paperwork regarding bid submission. School teachers responsible for sending tender information underlined the ease of the MPP, although lamented that the issue of guaranteeing high quality commodities remained unsolved.

Overall, teachers, traders and FBOs all saw great opportunity for the MPP to be scaled-up to other schools and include other government programmes such as prisons and hospitals. Once small hitches in the system are overcome the traders and FBO's stated that the MPP would bring real efficiency within the commodities market and replace existing procurement systems. Traders emphasised the disconnection between market actors such as smallholders, traders and FBO's is a large stumbling block that needs to be overcome, of which the MPP could play a part. Similarly, FBO's explained a breadth of benefits and potential for the MPP to improve monitoring, evaluation and transparency, suggesting this will be the bases of local agricultural development. Teachers highlighted the efficiency brought by the MPP, although further software development would be required as well as more time in training the users. All respondents were very keen to see the system improve and anticipated it being part of the process by which commodity markets will become more open, fairer and competitive.

Learning highlights

Observations

- Traders and FBO's stated that the MPP would bring real efficiency within the commodities market and should replace existing procurement systems, however issues of guaranteeing high quality commodities remained unsolved.
- MPP lowered transaction costs of all stakeholders.
- FBO's are not currently bidding within the existing market prices and present significant incompetence in terms of exercising a successful pricing strategy. Most offerings by FBO's were generally far greater than those by traders.
- When comparing prices offered by traders, the spread of bids is reasonably tight, suggesting good market competition and efficiency, whereby market information between traders is fluid and consistent.
- Clear conflict between traders and inconsistency of geographic areas of competition i.e. traders not repeatedly forming the same group of competitors for each school, suggests little evidence of trader collusion exists.
- Market domination is apparent and well noted by traders, schools and FBO's, where an individual trader won 75% of the available school feeding market.
- The selection criteria seriously compromise FBO access, where issues of institutional selling experience and reputation are a higher driver of success than price.
- 68% of winning bids were the highest received by schools.

Recommendations

- FBO's need significant support in developing pricing mechanisms and marketing their ability to respond to bid requests.
- A maximum number of schools per supplier should be set.
- The school feeding market must remain competitive, where FBO capacity investment must aim to advance FBO's to be more competitive with traders.
- To support access of FBO's within the market the selection criteria concerning institutional reputation and experience, should consider independent evaluations by the Ministry of Agriculture to determine if FBO's can competently deliver on their bids. This will help overcome the vicious cycle of market exclusion due to inadequate experience, as presently experienced by FBO's.
- Feedback to bidders is highly desirable and should be prioritised in the second phase of the MPP rollout.

Moving forward

High degrees of user uptake exhibited during this pilot, in addition to the Kenyan rural populous enjoying expansive mobile phone coverage and financial inclusion through mobile technology, is the driver for further development and scale-up. However, as the current MPP was developed as a minimal viable option to explore user uptake and potential for virtual trading by smallholders, FBO's, traders within the school feeding market, in addition to the sound results from the field, there exists a significant justification to advance the MPP system – creating MPP2.

As it stands the MPP is highly dependent upon the administrative foundation of the existing school feeding tendering/procurement process, where many areas of this process stand to be improved through inclusion within the MPP standard operating functions not already present. The MPP design tested only allows bids to be submitted and accepted, any consequential financial transaction is reliant upon the paper based system of the Ministry of Education. Furthermore, the documentation of historic performance of suppliers, in addition to their capacity profile remains only present at school and district level. The grounds of decision making and performance of suppliers is also not easily reflected upon at the county or national level, especially in terms of why commodities were or were not accepted at the school gate. Issues of carry-over stock and the tracking of school feeding distribution remain fraught with long lag periods in gaining information, which is critical for strategic decision making and budget forecasting.

With adequate funding, the MPP should enter the second phase of development, whereby the aim would be to replace the existing procurement system in totality. This would essentially create a fully automated programme monitoring and buying system, which accounts for school based indicators such as enrolment and attendance, supplier profiles and selling performance, as well as making the entire procurement process electronic. Each phase of the procurement cycle would be substituted by MPP in the following way;

Step 1: Cash Transfer from the treasury would be informed by enrolment figures provided by schools through the MPP, this would include levels of carry-over stock and availability of non-food items such as bowls, spoons, pans, etc.

Step 2: Public Announcement would continue very much the same as trialled in this pilot, although improvements to text message content and timing, with which the request for tenders is sent to bidders, would be improved. This would be achieved by having the text information uploaded to a cloud server that in turn sends the information to registered vendors all at the same time.

Step 3: Receipt of Bids & Winning Bid Selection will be improved by all bids being received by the cloud server and sent to schools as a single tranche of information all at the same time. Selection would remain the responsibility of schools although it is envisioned supplier selection will be accompanied by justification for inclusion and exclusion. Again, this will be via the server cloud and sent to all bidders simultaneously.

Step 4: Receipt of Goods, Inspection & Validation stands to be integrated into the MPP by including an acceptance function on the side of the buyer (i.e. schools). This would include a camera function to document the visual quality of commodities provided by winning suppliers that is uploaded to a school profile. Further the MPP would describe the volume of commodities expected, where schools can confirm the bid offering was honoured by the supplier.

Step 5: Supplier Payment could be made instantaneously by the MPP as supplier profiles stand to include payment details the server cloud would either inform Ministry of Education procurement offices or banks directly to settle the outstanding supplier invoices. Although this may entail a degree of centralisation of banking to either county or national level. The benefit of completely removing the burden of paper based administration from School Management Committees, would pose a significant long-term benefit.



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