Increasing small-scale farmers' access to agricultural markets

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Farmers in low- and middle-income countries face challenges accessing markets and earning profits on their agricultural goods. When small-scale farmers have better access to both markets where they buy inputs for their own farming and markets where they sell their goods, they often invest more in their farm, have higher yields, and trade more easily. This helps them produce higher-value crops and have higher incomes. Both farmers and consumers benefited from more stable food prices when farmers used credit and crop storage technologies and had access to better transportation networks like roads.

Elen Marlen, Shutterstock

Summary

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Farmers need access to markets both to purchase agricultural inputs (such as fertilizers, seeds, agro-chemicals, credit, and insurance) and to sell their goods. In remote areas of many low- and middle-income countries, transport costs are high, markets are not well connected to each other, and farmers may be isolated or marginalized, unable to interact with markets either as sellers or buyers [16], [19], [29]. Small-scale farmers in particular face many barriers to accessing markets, or accessing them at the right time, which hurts their profitability.

Market access may be a key ingredient to overall agricultural productivity given that high input prices, low output prices, large variation in prices offered at point of sale, and inefficient intermediary markets can all depress farmers' incentives to invest in their business [16], . [1] In this way, poor market access can prevent farmers from adopting new practices, in turn reducing yields

and profits. Facilitating market access requires policymakers to tackle big challenges often associated with large investments, like national-level infrastructure projects or market (de-)regulation. However, there are smaller activities that can also address rural market challenges, including connecting farmers to markets through rural transportation infrastructure or digital platforms, improving input access and the credibility of input quality, increasing crop storage, and securing a buyer before planting through contracting. While there is little evidence from randomized evaluations on large-scale market expansion policies and investments like road building, cross-border trade agreements, and scaling distribution networks, there are important learnings from existing research on smaller investments.

A review of sixteen randomized evaluations and thirteen quasi-experimental studies shows that several types of market access interventions had positive effects on farmers' production and welfare. Specifically, contracting, providing access to crop storage and credit, connecting traders and farmers, and providing incentives to traders improved farmers' allocation of resources and increased input investment as well as crop yields. Along with interventions that improved rural transport infrastructure, these interventions also led to reduced variability of prices offered during sales negotiations and increases in farmers' incomes, revenues, and/or profits.

Given the two-sided nature of markets, these interventions created benefit trade-offs between different actors, namely farmers, traders, and consumers. For example, when farmers benefited from information on prices shared with both traders and farmers, traders, who often benefit from price gaps between sellers and buyers, were less able to exploit these gaps as there was more transparency and openness of trade [8]. While the benefits of these interventions to farmers are clear, understanding how these smaller-scale market interventions affect trade-offs between market actors is critical for policymakers when scaling to ensure the long-term sustainability of agricultural technology adoption and improve small-scale farmers' welfare over time.

Supporting evidence

When transport infrastructure connects rural areas to distant markets and services within a country or to international markets, it can improve farmers' welfare and their ability to optimize their production.

Expanding or rehabilitating transportation infrastructure can improve farmers' welfare while simultaneously posing important challenges and distributional implications.[2], Specifically, six [2], [3], [11], [20], [28], [30], out of seven quasi-experimental studies [2], [3], [11], [20], [22], [28], [30], found that highway, rural road, or footbridge expansion in rural areas led to improvements in local economic activity [2], [11], [20], [28], , crop diversification [3], [22], [30], , or agricultural income [3], [11] , .[3], Opening local markets and supply chains can expose farmers to new risks, such as global price shocks and supply chain disruptions, while increasing the markets they can access to offload their surplus goods. For example, a quasi-experimental study examining forty years of highway expansion to rural farming communities in India found that physical transport improvements alone increased farmers' real incomes by 2.2 percent [3]. Additionally, improving access to both highways and rural banks increased their incomes by 2.8 percent due to their investment in higher-risk, higher-return crops. This suggests that connecting rural farmers to broader markets and complementary services that de-risk their business can improve their welfare as well as encourage them to optimize their production.

Contract farming arrangements lower barriers for farmers to make productivity-enhancing investments, create a stable buyer for goods, help them overcome variable prices, and allow them to optimally allocate resources between the crops they grow.

Contract farming is a common structure designed to integrate value chains, where large buyers, often of one crop, secure contracts with farmers to purchase their goods at the end of the season. Contract arrangements may provide partial payment upfront and/or access to credit, high-quality inputs, or information to facilitate farmers' production. Five randomized evaluations [4], [5], [10], [13], [23], and three quasi-experimental studies [7], [27], [32], showed that secure contracts increased

investment in inputs [4], [27], , improved yields [4], [10], [13], , and increased farmers' income [4], [5], [7], [10], [27], [32] in cases where there were limited alternative buyers. Consistent contracts and simple financing mechanisms also increased farmers' allocation of resources to the contracted crop.

For example, in a quasi-experimental study in Colombia, participating in a large-scale coffee quality upgrading program that leveraged different contracting mechanisms between actors in the value chain increased investment in production, land devoted to growing coffee, coffee quality, and prices paid to farmers who grew higher-quality coffee [27], . Similarly, in a randomized evaluation in Benin, rice producers were offered one of three contract types that set a fixed price and either provided a loan to purchase inputs at the start of the season or added extension visits [4]. Farmers who were offered any contract increased their area planted with rice by 23 percent, yields by 29 percent, rice sold by 140 percent, income by 52 percent (an increase of US$140), and their use of inputs compared to those who did not receive a contract offer. This suggests that the contract, providing a fixed and stable price, unlocked farmers' ability to make decisions and efficiently allocate resources as well as to overcome other barriers to productivity and profitability. Despite clearly accruing benefits to farmers, contract farming is often driven by private sector buyers who have their own interests, agendas, and limitations, so writing contracts that optimally support farmers and scaling up contract systems to support a broader group of farmers are persisting policy challenges.

Farmers lack access to consistent inputs, and even when they are accessible, farmers do not often trust their quality. Well-timed input markets, improved supplier information, and quality certification systems help farmers access quality inputs, but more systems that overcome this trust deficit are needed.

Missing supply chains, inadequate infrastructure, high prices, counterfeits, and lack of input brand recognition hinder small-scale farmers' ability to access inputs. Contract farming may be one viable solution to overcoming some of these credibility issues in input markets, but tailored systems are needed. Two randomized evaluations [15], [18], show that targeting private input suppliers increased farmers' input adoption. In a study in Mali, where 70 percent of small-scale farmers lacked access to a local input supplier the prior year, providing one-day markets or village input fairs, where input suppliers visited farmers' communities, increased farmers' purchase of inputs and fertilizer use [18], . In another example in India, informing input suppliers about a new flood-tolerant rice seed variety increased farmer-level adoption by over 50 percent compared to the standard government outreach approach, suggesting that improving marketing or branding of inputs motivated input suppliers to expand sales and successfully encourage farmers to invest in optimal inputs [15].

On the other hand, input suppliers may provide lower-quality inputs when quality is difficult to verify, or provide advice to maximize their own profits, furthering farmers' lack of trust in input quality at market [15], . Because of this, farmers may also doubt the credibility of quality standards, certifications, and trademarks featured on products sold by these same input suppliers. In these contexts, improving consumer information on quality may help. In rural Kenya, an information campaign promoted an SMS-based quality verification system to help farmers avoid counterfeit seeds in the hybrid maize seed market. Farmers with information on how to detect counterfeits changed where they bought seeds and improved their agricultural productivity [25], . A review of randomized evaluations, suggests that signaling output quality through publicly recognizable systems (rather than supplier-specific quality signals) can help to overcome a trust deficit between market actors. Therefore, policymakers and private sector companies should consider building public, reputable quality signals into local input markets.[4]

Improving connections between buyers and sellers improves the flow of goods traded and therefore small-scale farmers' profitability.

Traders, or intermediary buyers and sellers, are critical for connecting and transporting goods between actors in supply chains, so ensuring that intermediary markets function efficiently is a first-order policy concern. However, local intermediary markets suffer from a number of issues that interfere with trade, including a limited number of buyers, buyer collusion, matching sellers and buyers, and limited quantities to meet buyers' demand. Entry of more traders can increase the number of options from which

farmers have to choose, but there may be other barriers, such as traders knowing prices from other traders and knowing which farmers are selling and when. A review of randomized evaluations, shows that providing price and market information to farmers had no impact on the average prices that farmers received across markets, suggesting that information alone might not be enough to overcome traders' substantial market power and other constraints might be more salient.[5], Four randomized [8], [9], [14], [33], and four quasi-experimental evaluations [21], [26], [27], [31], show that when traders were informed of and found a match with farmers, securing the quantities they needed, they passed through price gains [21], [31], [33], to farmers and/or consumers, sometimes leading to improvements in farmers' profitability [8], [10], [27], . Increasing the number of traders in a market to facilitate competition did not benefit consumers [9].

For example, in Uganda, a digital platform connecting farmers and traders and sharing frequent price information through SMS to traders increased the flow of maize to buyers and reduced price variability for farmers across nearby maize markets [8]. Farmer revenues increased in areas with larger maize supplies. On average, traders' profits decreased by 14 percent, suggesting that price convergence across markets eroded traders' ability to profit from buying and selling maize in different markets. In this example, when markets could overcome the challenge of matching, traders passed through value to farmers.

When there is a deficit of traders or quantity of goods to trade, incentivizing traders to pass more value through sale prices or to enter new markets might reduce the power imbalance between a small number of traders and farmers. In Sierra Leone, cocoa traders, who were offered a bonus per pound of cocoa sold, more frequently offered credit to farmers through advance payments for end-of-season sales [14], . While the bonus did not affect the prices paid to farmers, the credit allowed traders to secure business at the start of the season. Farmers benefited from access to financing, which allowed them to invest in their production through input purchase. Another randomized evaluation in Kenya found that incentives for traders did not lead to benefits for consumers [9]. To test levels of competition in the market, researchers offered Kenyan maize traders a cost reduction to see how they would distribute or capture that added value. Traders passed through 22 percent of the value from reduced costs to consumers through lower prices but colluded with other traders to set a higher overall price, capturing about 80 percent of value. In this case, cost incentives induced more traders to enter the maize market but did not systematically increase competition or meaningfully improve prices for consumers. Taken together, these examples show that there are real matching, trust, and power challenges in local intermediary markets that need to be further explored.

Crop storage technologies, when complemented by credit, improve farmers' income by helping them save harvests and shift sales to times when prices are higher.

Markets tend to be flooded with staple grains immediately after harvest, driving prices down with the surge of supply. Crop storage technologies, including hermetically sealed bags and grain warehouses, offer enhanced protection from pest and weather damage and allow farmers to save their crops for future household use or sale when markets are no longer flooded with supply, thus theoretically increasing prices for all selling farmers. However, due to the nature of the agricultural cycle, farmers are severely resource constrained at harvest, having invested substantial resources at the start of growing and earning limited agricultural income since. As such, pairing storage technologies with credit products may encourage farmers to use these technologies while providing them sufficient funds to cover their household needs as they wait for a competitive price.

Four randomized evaluations [1], [6], [12], [17], in Burkina Faso, Indonesia, and Kenya found that complementing storage and credit technologies increased farmers' incomes, revenues, and/or profits in the presence of seasonal price fluctuations. In Burkina Faso, participants with access to credit when grain was stored as collateral in secure warehouses sold harvested grain later in the season, resulting in a 15 percent increase in crop revenues at a value of approximately US$235 compared to farmers without access [17], . Similarly, in Kenya, farmers offered post-harvest loans and storage technologies increased their profits from maize sales [12]. Moreover, local prices were less volatile when recipient farmers stored more grain, and nonrecipients seemingly benefited from smoother prices, even though their storage behavior remained unchanged. Pairing storage with credit ensures

that farmers have resources to sustain their livelihoods through the ups and downs of production. However, more research is needed to understand how scaling and elongating credit systems affects risk to credit providers and whether these policies are sustainable over time.

Research has shown that various interventions to facilitate farmers' access to markets can benefit multiple actors in a value chain, but there are real benefit trade-offs depending on the targeted actor and intervention. Based on this evidence, policymakers can make strategic investments in tested innovations to facilitate well-functioning markets.

Improving the development and adoption of productive agricultural technologies and increasing yields remain important goals for ensuring local food security in low- and middle-income countries. Supporting interventions, like contracting and buyer-seller matching, can improve farmers' productivity, incomes, and profitability in some contexts. However, other interventions may benefit farmers at the expense of traders or consumers. Markets work in complex ways that alter the distribution of benefits, and by understanding these trade-offs, policymakers can support markets by scaling up and testing these interventions at scale to ensure that the impacts carry through and continue to reduce market barriers for farmers and traders alike.

Sector chair(s) or Academic lead(s)

Craig McIntosh

Insight author(s)

Jenna Fahle

Emily Sylvia

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1. Intermediary markets are those that connect buyers and sellers along a value chain. For instance, intermediaries, such as cooperatives, traders, or middlemen, connect raw agricultural goods to end buyers, exporters, or processors.
2. For an academic review of the literature on land transport infrastructure, please see this 2023 VoxDev Lit.
3. One study in Ethiopia found that access to all-weather roads generated improvements in agricultural productivity but only when complemented with agricultural extension services (Gebresilasse 2023).
4. For an in-depth review of the rigorous evidence on incentivizing high-quality outputs, please see this J-PAL Policy Insight.
5. For more details on this result, please review this J-PAL Policy Insight.

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