

EMERGING INSIGHTS

Improving Input & Output Markets to Support Smallholder Farmers in South Asia and Sub-Saharan Africa: Evidence from the Agricultural Technology Adoption Initiative

Agricultural Technology Adoption Initiative:

The Agricultural Technology Adoption Initiative (ATAI) has funded more than forty rigorous evaluations, the majority full-scale randomized controlled trials, addressing critical evidence gaps with rigorous, causal evidence. ATAI studies seek to advance practical understanding of the obstacles and opportunities critical to technology adoption for smallholders. The “Emerging Insights” series distills evidence from ATAI and complementary studies to broadly share the outcomes of the project as a means to inform programming and policy. The following brief focuses on improving input and output markets.

Context:

In sub-Saharan Africa farmers tend to operate largely in shallow markets where investing in inputs and technologies that increase yields may not increase farmer profit. Farmers may receive lower prices from markets flooded with increased supply. This suggests that interventions that increase farmers’ access to deeper output markets – such as better infrastructure and contracts – may increase farmers uptake of inputs that improve yields, because it will also open opportunities to improve profits.

Price Information:

Information about market conditions and prevailing prices may be very important as farmers decide how, when, and where to sell their harvest. Given that prices may vary substantially across relatively small distances and small intervals of time, accessing price information in principle could lead to much larger profits for farmers, by allowing them to bargain with traders or choosing to sell at markets with higher prices.

Evidence-based insights:

- **Simply providing price information to farmers is unlikely to have significant effects on farmer incomes or price levels** as the information alone does not give farmers strong bargaining power in the presence of high transport costs (Fafchamps & Minten 2008) (Mitra et al. 2015) (Goyal 2010) (Aker 2010).
- **Yet when price information is provided to intermediaries or producers with direct access to markets, market prices converge and producers may benefit** (Jensen 2007).

Input & Output markets: Future research

Research results are thus far insufficient to provide robust evidence-based insights to address the following key questions/hypotheses:

- **Is lacking infrastructure a primary barrier to agricultural technology adoption?**
Increasing market access through infrastructure development may increase access to inputs and decrease their costs, and may increase access to output markets which may increase the profitability of technology adoption and increase yields (Ashraf et al. 2009) (Ali 2011). Some evidence indicates that infrastructure investment may to some extent depend on the existing market for agricultural commodities (Casaburi et al. 2013), and farmers' ability and willingness to pay the price for better market access (Raballand et al. 2011).

- **Do enforceable contracts between farmers and purchasers improve supply chains, with benefits to farmers and/or traders?**
Enforceable contracts may create economies of scale, and could facilitate access to technologies, financial services, and output markets that may provide opportunities for higher yields and higher profits for smallholders (Casaburi & Reed 2014) (Brambilla & Porto 2011) (Casaburi et al., forthcoming).
- **Does crop quality information get passed along the value chain, and are higher quality outputs rewarded?**
Buyers and sellers may not trust each other (Fafchamps et al. 2008), and/or farmers may be most strongly rewarded by the quantity and directly observable characteristics of what they sell, rather than the quality (Hoffmann et al. 2013). Even if information about crop-quality passes credibly through the value-chain, smallholders may not benefit enough to pay for increased quality under certain contract conditions or other relationships with intermediaries (Casaburi & Reed 2014). Evidence to this effect may help explain if/how value chain dynamics could affect low investment in quality-enhancing technologies.

Given the limited evidence-based insights above, and current interest among related researchers and practitioners, ATAI suggests emphasis on the following topics to further understand effective interventions to input and output market structures that improve smallholder productivity and profits.

Emphasized:

- RCTs that can identify if/how market shallowness¹ may be a significant constraint to productive investment
- Contract farming arrangements
- The role of quality in pricing across the supply chain

De-Emphasized:

- Systems that only provide price information without addressing smallholders' bargaining power and access to markets

Evidence cited

- [Aker, J. C. \(2010\)](#). Information from markets near and far: Mobile phones and agricultural markets in Niger. *American Economic Journal: Applied Economics*, 2(3), 46-59.
- [Ali, R. \(2011\)](#). Impact of rural road improvement on high yield variety technology adoption: Evidence from Bangladesh. Working Paper, University of Maryland.
- [Ashraf, N., Giné, X., & Karlan, D. \(2009\)](#). Finding missing markets (and a disturbing epilogue): Evidence from an export crop adoption and marketing intervention in Kenya. *American Journal of Agricultural Economics*, 91(4), 973-990.
- [Brambilla, I. & Porto, G. G. \(2011\)](#). Market Structure, Outgrower Contracts and Farm Output. Evidence from Cotton Reforms in Zambia. *Oxford Economic Papers*, 63(4), pp. 740-766.
- [Casaburi, L., Glennerster, R., & Suri, T. \(2013\)](#). Rural Roads and Intermediated Trade: Regression Discontinuity Evidence from Sierra Leone. Working Paper.
- [ATAI] [Casaburi, L. & Reed, T. \(2014\)](#). Interlinked Transactions and Pass-Through: Experimental Evidence from Sierra Leone. Working Paper. Revise and Resubmit in progress to *American Economic Journal: Applied Economics*.
- [ATAI] [Casaburi, L., Kremer, M., Mullainathan, S., & Ramrattan, R. \(Forthcoming\)](#). “Harnessing ICT to Increase Agricultural Production: Evidence from Kenya”.
- [Fafchamps, M., Hill, R. V., & Minten, B. \(2008\)](#). Quality control in nonstaple food markets: evidence from India. *Agricultural Economics*, 38(3), 251-266.
- [Goyal, A. \(2010\)](#). Information, direct access to farmers, and rural market performance in central India. World Bank Policy Research Working Paper 5315.
- [Hoffmann, V., Mutiga, S., Harvey, J., Nelson, R., & Milgroom, M. \(2013, August 4-6\)](#). Asymmetric Information and Food Safety: Maize in Kenya. Selected Paper prepared for presentation at the Agricultural & Applied Economics Association’s 2013 AAEA & CAES Joint Annual Meeting, Washington, DC.
- [Jensen, R. \(2007\)](#). The digital divide: Information (technology), market performance, and welfare in the South Indian fisheries sector. *The Quarterly Journal of Economics*, 122(3), 879-924.
- [Mitra, S., Mookherjee, D., Torero, M., & Visaria, S. \(2015\)](#). Asymmetric Information and Middleman Margins: An Experiment with Indian Potato Farmers. Working Paper.
- [Raballand, G., Thornton, R. L., Yang D., Goldberg, J., Keleher, N C., & Mueller, A. \(2011\)](#). Are Rural Road Investments Alone Sufficient to Generate Transport Flows? Lessons from a Randomized Experiment in Rural Malawi and Policy Implications. World Bank Policy Research Working Paper 5535.