

Restoring Trust: Evidence from the Fertiliser Market in Tanzania

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A lack of trust in product quality can distort markets, reducing demand and investment. Can a low-touch information campaign improve confidence in fertiliser quality in Tanzania, raising demand for a critical agricultural input?

Introduction and Policy Context

Trust is essential to well-functioning markets. It is central to relationships among producers and consumers and to remedying information asymmetries between sellers and buyers. Markets that lack trust, for example where buyers have doubts about the product quality of inputs, have higher transactions costs, as consumers must expend more effort and time in evaluating commodities they need. Problems with trust can reduce market participation and investment by buyers and sellers.

Trust has a special importance in contexts characterised by limited regulation and fragmented quality control. Several studies have found that farmers in Sub-Saharan Africa are suspicious of the quality of fertiliser available in their local markets (Michelson et al. 2021; Bold et al. 2017; Sanabria et al. 2018a, 2018b). In particular, farmers worry about being sold adulterated fertiliser – fertiliser deliberately mixed with substances like rocks, sand, or salt. About two thirds of small farmers in these studies report concerns that at least some of the fertiliser in their local market is adulterated, that it is less agronomically effective, and with a lower yield response and profitability. The paradox is that recent research has also found that the quality of fertiliser in these markets is consistently good (Michelson et al. 2023 summarises the recent evidence), with nutrient content matching or approximating the product's manufacturing standards.

So why are farmers persistently suspicious of fertiliser quality? One reason is that fertiliser is an experience good – its quality is difficult to assess before its actual use. Research by members of our team (Hoel et al. 2023) has shown that farmers often misattribute low crop yields to bad fertiliser when the driving factor may be something else: low or late rainfall, misapplication, or use of incorrect fertilisers for a given plot's soils. Misattribution in these contexts means that farmers may never accurately evaluate the available fertiliser, even after hundreds of observations linking its use to maize yields.

Could a credible information campaign about fertiliser quality help farmers understand that fertiliser in local markets is good? Can we change incorrect beliefs about fertiliser quality and, by changing beliefs, improve both demand for the input and crop yields? Fertiliser demand and use is low in Tanzania – between 15 and 20 kg per hectare, significantly below recommended amounts (World Development Indicators, 2021). This keeps crop yields low and contributes to food insecurity and poverty in rural areas.

Methodology and Research Design

To answer the research question, we used a randomised controlled trial to evaluate the effects of a light-touch information campaign on farmer beliefs about fertiliser quality and their purchase and use of fertiliser. We conducted our study in the Morogoro District, in Tanzania. In an earlier project in 2015-16 (in the same location), we had conducted the purchase (by mystery-shoppers) and lab-based quality testing of approximately 300 urea fertiliser samples. In the present study we built on those results: in early 2019, we used our randomised design to publicise the results of these fertiliser quality tests to markets and farmers in order to assess the effects of promulgating such information. In both studies we collaborated with researchers at Sokoine University, a respected agricultural university well known to farmers in the region.

We carefully designed the information campaign and the roll-out in order to isolate the effects of the information: 50 markets in the treatment and 50 markets in the control group, with about 250 fertiliser sellers distributed across those 100 markets. In treated markets, we informed the agri-dealers of our study results: that we had tested the urea fertiliser at that market and found it to be of good quality. Then we asked whether we could display a poster at the shop with the following text in Swahili: “The fertiliser test was conducted by IITA and Sokoine University of Agriculture (SUA). All Urea samples tested in 2016 were found to have 46% Nitrogen. This means that urea fertiliser met the international standards of quality. Urea fertiliser had a good quality.” Figure 1 shows the poster that we used. We left some pamphlets with additional information that dealers could give to their customers. Finally, before we left the market, we hung one poster at a central location.

Figure 1: Posters given out to agri-dealers in treated markets.



We paired each market with between one and two proximate villages. The treatment villages received an information treatment that mirrored the market treatment: we gathered all village residents and informed the attendees about the urea fertiliser test results in their associated market. If farmers asked about other markets, we provided them with this information as well. We also provided farmers with flyers that communicated that the testing had been conducted in 2016 by Sokoine University researchers, and that the results indicated that the urea fertiliser was of good quality.

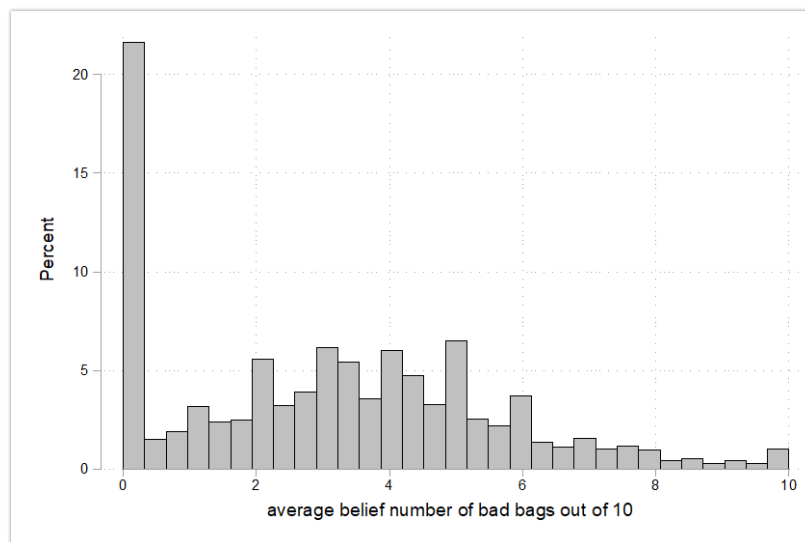
We returned a year later to assess the effects of the information treatment. Our design and data collection allow us to estimate the effects of the intervention on both the supply and the demand side; that is, on both fertiliser sellers and on farmers.

Main Findings

We report four main findings from the experiment. First, we find that farmers are concerned about fertiliser quality at baseline: on average, farmers assume that 30% of fertiliser for sale in the market is bad, though we see considerable variation in the degree of concern across farmers and across villages. For example, about 20% of farmers think there are no issues with fertiliser quality while the beliefs of all the others follow a roughly normal distribution. Figure 2 presents this distribution of

farmer beliefs prior to the intervention. It is notable that there are no villages in which everyone is unconcerned about fertiliser while in 10% of villages all surveyed farmers expressed concerns.

Figure 2: Distribution of farmer beliefs about fertiliser quality at baseline



Note: farmers reported the number of bad quality bags out of ten; n=995.

Second, the information treatments change farmer beliefs about fertiliser quality. Farmers in treatment villages significantly decrease their estimate of the prevalence of bad fertiliser in the market. While at baseline farmers estimate that about 20% of the fertiliser in the market is bad, after treatment that number drops to 14% in the treatment villages. Moreover, the likelihood that a farmer has any concern at all decreases by 10 percentage points. Farmer beliefs change most for proximate markets where they had not previously purchased fertiliser.

Third, farmer belief changes map into behaviour change. Farmers in treatment villages are 11 percentage points more likely to purchase fertiliser in the next growing season. In particular, treatment induces farmers who have not purchased fertiliser before to give it a try, and makes farmers more likely to purchase from closer markets that they have previously avoided. The treatment seems to re-establish their trust in those more local markets. Treatment does also increase purchase of hybrid maize seed, an input that complements fertiliser use. We do not find results on maize yields nor on the purchase and use of other agricultural inputs.

Finally, on the supply side, we estimate sizable seller-level impacts of treatment on the quantity of urea sold, with an effect size of almost 5%. Moreover, we find that agri-dealer prices *do not change* in treatment markets. We had been worried about price increases and carefully monitored prices across treatment and control markets during the growing seasons.

Policy Implications

Our study shows that an inexpensive, low-touch information campaign had an effect both on the beliefs and behaviour of market participants. We did not provide credit; we did not provide tailored advice; we did not deliver fertilisers to farmers' doors. Farmers who had not used fertiliser before responded to credible information about fertiliser quality. And they bought more fertiliser. We can see those effects both in farmer reports of their own purchasing and use but also in the sales of agri-dealers operating in treatment markets.

It is important to point out that concern about quality is not the only constraint that farmers face accessing fertiliser for their crops and it is unlikely to be the most important one. Farmers also deal with challenges related to uninsured production risks, with output market price volatility, with insufficient credit to finance production, with problems accessing the right fertilisers at the right times. But our work suggests that concerns about quality may be a constraint for some farmers, keeping them from trying fertiliser on their crops. Many farmers in treatment villages still had concerns about quality at endline (i.e. after the intervention), meaning that the meetings and pamphlets did not resolve all of their concerns. Even so, our results suggest that policymakers can use a credible information campaign to change beliefs about product quality and behaviour. Our results also suggest the importance of the distortions and costs associated with not restoring or ensuring trust in these and other critical markets.

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