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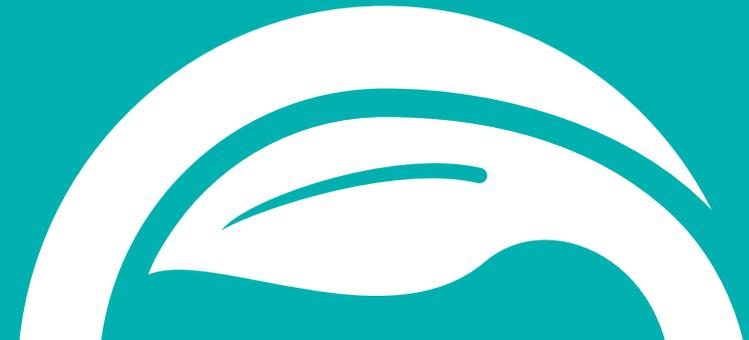
BUSINESS SOLUTIONS TO POVERTY



TechnoServe Coalition for Smallholder Sourcing

Incentivizing Farmers to Drive Greater Production and Sales from Their Peers

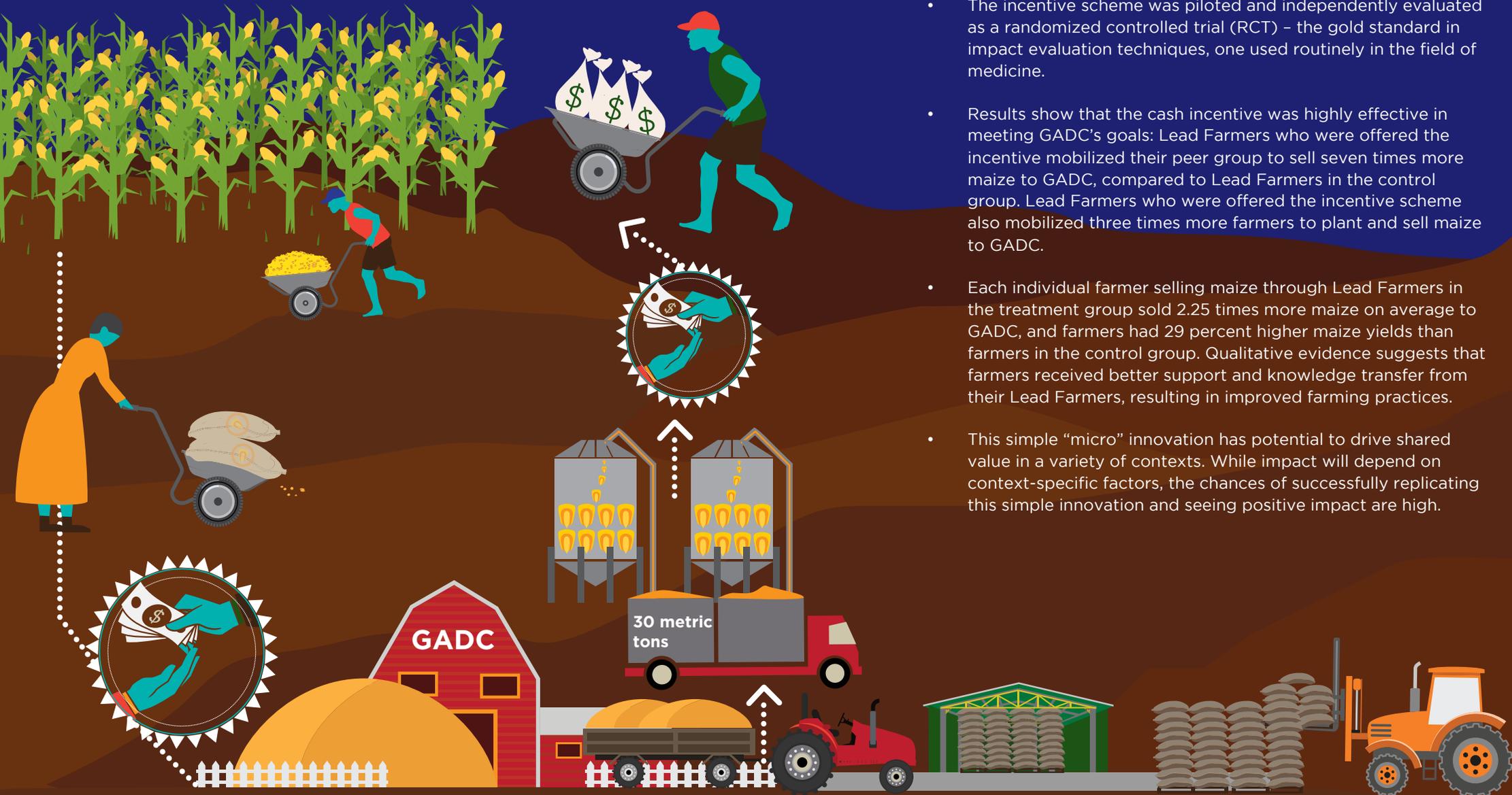
Results from a simple and scalable experiment in northern Uganda



Summary

- Gulu Agricultural Development Company (GADC), an agribusiness in northern Uganda, tested a performance-based incentive for Lead Farmers in the context of maize. Lead Farmers are volunteers who offer to teach good agronomic practices to a group of neighboring farmers. The goal was to motivate volunteer Lead Farmers to drive up peer group production and their sale of maize to GADC.

- The incentive was simple and straightforward: Lead Farmers were offered a cash incentive of 300,000 Ugandan shillings (approximately US\$90), if they were able to get their peer group of farmers to collectively sell over 30 metric tons (MT) of maize to GADC, and 10 Ugandan shillings for every kilogram thereafter.
- The incentive scheme was piloted and independently evaluated as a randomized controlled trial (RCT) – the gold standard in impact evaluation techniques, one used routinely in the field of medicine.
- Results show that the cash incentive was highly effective in meeting GADC's goals: Lead Farmers who were offered the incentive mobilized their peer group to sell seven times more maize to GADC, compared to Lead Farmers in the control group. Lead Farmers who were offered the incentive scheme also mobilized three times more farmers to plant and sell maize to GADC.
- Each individual farmer selling maize through Lead Farmers in the treatment group sold 2.25 times more maize on average to GADC, and farmers had 29 percent higher maize yields than farmers in the control group. Qualitative evidence suggests that farmers received better support and knowledge transfer from their Lead Farmers, resulting in improved farming practices.
- This simple “micro” innovation has potential to drive shared value in a variety of contexts. While impact will depend on context-specific factors, the chances of successfully replicating this simple innovation and seeing positive impact are high.





Context

Smallholder sourcing arrangements have the potential to drive significant shared value in the context of African agriculture. These systems link networks of smallholder farmers with buyers, and offer the promise of a symbiotic relationship where companies can access raw materials locally, and farmers have a reliable off-taker, access to inputs, financing, and technical expertise.

Despite the promise and potential, such arrangements are fraught with persistent challenges. Farmers typically demonstrate low production and limited loyalty. Companies tend to face high sourcing costs, inconsistent supply, and the risk of side-selling.

If an agribusiness is able to deliver better extension and training, and more supervision and oversight over farmers, this can help to improve farmer productivity, as well as loyalty and sales to the company. For example, by delivering better training and supervision,

farmers are more likely to adopt good agronomic practices and see higher yields. With closer engagement, communication and supervision, farmers are more likely to stay loyal (i.e., plant the crop the company buys and sell to the company).

However, better extension and more supervision require additional resources: often this means more boots on the ground, translating into a higher cost structure and greater potential loss in the case this does not lead to higher sales.

Within the context of the Coalition for Smallholder Sourcing (see text box), GADC chose to pilot a simple, innovative strategy to motivate its volunteer Lead Farmers to do just this: deliver better training and extension, exercise better oversight, and motivate their peers to stay loyal to GADC.



The Coalition for Smallholder Sourcing

The Coalition for Smallholder Sourcing is a TechnoServe-led partnership between three private agribusinesses with large-scale outgrower schemes in place (Gulu Agricultural Development Company, JFS-SAN, and Plexus Mozambique Limited) and a high-caliber research partner (IDinsight). The Coalition allows for the piloting and rigorous evaluation of company-led innovations (e.g., new strategies, models of engagement, technologies) that have win-win potential for the participating companies and smallholder farmers.



The Innovation

GADC, based in northern Uganda, buys cotton, sesame, chili, sunflower, and maize from its supplier base of over 50,000 smallholder farmers. GADC employs a small extension team that offers training in good agronomic practices to a group of volunteer farmers, or Lead Farmers. Lead Farmers are expected to pass this training on to their neighbors and peers, and maintain a demonstration plot to showcase the impact of adopting good practices on productivity. Lead Farmers are not compensated, leading to varying levels of motivation.

In 2016, through the Coalition for Smallholder Sourcing, GADC tested out a performance-based incentive for Lead Farmers in the context of maize. The goal was to motivate these men and women to improve their performance and drive up their peer group's production and sale of maize to GADC.

The incentive was simple and straightforward. Prior to the start of the maize planting season, Lead Farmers were told they would be eligible to receive a cash incentive of 300,000 Ugandan shillings (approximately US\$90), if their peer group collectively sold over 30 metric tons of maize to GADC during the upcoming harvest, and 10

shillings for each kilogram thereafter. Lead Farmers were required to pre-select up to 30 farmers to be part of their peer group, and register the names of these farmers with GADC. At the end of the harvest, GADC would tally up the sales coming from each peer group, and Lead Farmers would be eligible to receive the cash incentive. GADC's opinion was that this incentive structure was sufficiently aspirational but achievable.

This innovation was designed to more effectively utilize GADC's network of Lead Farmers, without burdening the company with more fixed overheads in the form of extension team salaries. The incentive was expected to drive up maize sales to GADC through several different impact channels:

- **Encouraging positive behavior change around maize agronomy.** We expected Lead Farmers to drive up their peer group's productivity by more effectively transferring knowledge on good agronomic practices, by putting more effort into advising and supervising farmers, and by maintaining better demonstration plots. This channel is a clear win-win impact channel - it is good for farmers as well as the company.

- **Selecting better maize farmers to be in their peer-group.** Since the incentive scheme was announced before selection and registration of farmers to a Lead Farmer, we expected the incentive to encourage Lead Farmers to pre-select better and more capable farmers to be part of their peer group to begin with. This incentive would encourage Lead Farmers to target their effort towards those with more potential for maize sales to GADC.
- **Encouraging more farmers to sell to GADC.** We expected the incentive to encourage Lead Farmers to mobilize more of their peers to sell to GADC, up to the maximum of 30 farmers per Lead Farmer.
- **Encouraging farmers to sell more of their maize to GADC.** We expected the incentive to encourage Lead Farmers to put in greater effort towards getting their peers to sell more maize to GADC. This could happen by successfully promoting maize over other crops, by promoting sale of maize over home consumption, or by successfully promoting sales to GADC versus other competing buyers.



The Experiment

In line with the Coalition's objective to rigorously measure impact, the incentive scheme was piloted as a randomized controlled trial (RCT), and evaluated by IDinsight. An RCT is the gold standard in impact evaluation techniques and one used routinely in the field of medicine.

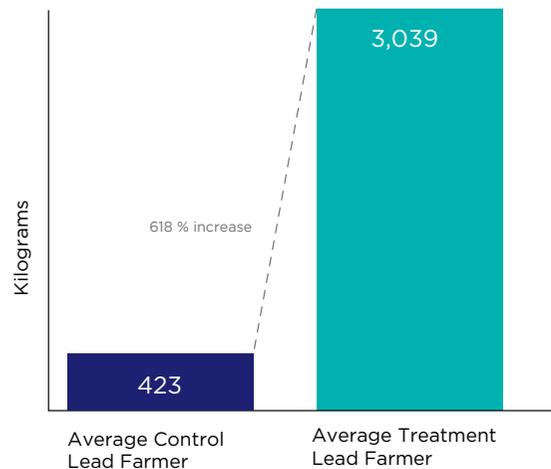
Of GADC's network of 800 Lead Farmers, 413 Lead Farmers were randomly selected to be part of a "treatment arm" that was offered the incentive program (treatment group), and a second group of 396 Lead Farmers was not offered the incentive (control group).¹

¹ The randomization was clustered to minimize the chances of Lead Farmers in the control group selling through treatment Lead Farmers and thereby "gaming" the system.

The Results

Results from IDinsight show that the incentive was highly effective at increasing maize sales to GADC.

Lead Farmers who were offered the incentive mobilized their peer group to sell seven times more maize to GADC, compared to Lead Farmers in the control group. The average Lead Farmer in the treatment Group mobilized his or her peer group to sell 3,039 kilograms of maize to GADC, compared to 423 kilograms for the control group. This represents a 618 percent increase in maize sales per Lead Farmer.



Analysis shows that there were multiple impact channels, discussed below:

Lead Farmer mobilized three times more farmers in their peer network to sell to GADC. Lead Farmers that were offered the incentive scheme, on average, mobilized 17 farmers to sell maize to GADC, compared to five farmers per Lead Farmer in the control group.

Lead Farmers saw their peers sell two times more maize to GADC. The individual farmer working with Lead Farmers that were offered the incentives on average sold 189 kilograms of maize on average to GADC, compared to only 84 kilograms on average for farmers working with Lead Farmers in the control group. This represents a 125 percent increase in average sale per farmer.

Farmers selling through treatment Lead Farmers, on average, demonstrated 29 percent higher maize yields within one season. Lead Farmers that were offered the incentive, on average, had farmers with higher maize yields selling through them – 1,200 kilograms per acre, compared to 933 kilograms per acre for the average farmer selling through control Lead Farmers.

Qualitative interviews conducted with Lead Farmers, farmers, and GADC staff suggests that higher sales and yields per farmer were driven by Lead Farmers changing the behavior of their peers in three ways: (1) by more effectively encouraging good agricultural practices amongst their peers; (2) by influencing farmers to sell their maize to GADC, relative to other buyers; and (3) by pre-selecting more productive maize farmers into their groups.

- 1) **More effectively encouraging good agricultural practices amongst peers.** Lead Farmers that were offered the incentive reported to interact more frequently with their peer farmers, and may have passed on more information on agricultural practices than counterparts that did not receive the incentive. One Lead Farmer said, “When I heard about the bonus, I bought seeds for my farmers.... I dug in the farmers’ fields if they were not able to do it themselves”. Another Lead Farmer said “I became more active compared to the previous season, I visited the farmers more often, made sure they are planting on the right soil using the best practices.”
- 2) **Influencing farmers to sell their maize to GADC.** Lead Farmers have influence over where farmers decide to sell their maize and are responsible for doing some market price analysis, which they then share with farmers. When asked if their Lead Farmer encouraged them to sell to GADC, one farmer stated, “Yes. He did because selling crops to the company gives us an assurance of care. GADC price is normally higher than other buyers.”
- 3) **Pre-selecting more productive maize farmers.** Finally, selection effects driven by Lead Farmers’ decisions are likely to have impacted results. As registration of farmers to Lead Farmers occurred after Lead Farmers were informed of their treatment status, treatment Lead Farmers had an incentive to work with the best, most productive maize farmers to increase their chances of reaching the sales threshold. It is likely that the



farmers treatment Lead Farmers chose to work with were better farmers than those chosen by control.

The innovation required a very small cost outlay for GADC. According to analysis conducted by Dalberg, the innovation had two cost elements that increased GADC's overall operating expenses by less than two percent. The first cost was related to the extra communication, monitoring, and tracking processes and

systems required to implement the innovation effectively; the second cost was associated with the payout of the actual bonus. Meanwhile, the seven-fold increase in maize volumes resulted in a significantly positive impact on earnings for GADC. Dalberg's analysis showed that the model is already showing positive earnings, with no initial investment outlay. While the incentive added a small cost and eroded GADC's profit margin slightly, the erosion in margin was compensated for by the expansion in revenues.

Applications

This innovation is an example of a simple strategy with potential for large and positive win-win impact in the context of smallholder sourcing. The results from the RCT clearly measure and quantify the strong impact of incentives for the company, and the positive impact on Lead Farmer behavior and farmer productivity.

While incentives are a well-documented strategy to align different actors toward a common objective, we find that incentives are not consistently used in the context of smallholder sourcing. While GADC did not historically pay or incentivize its Lead Farmers, due to the concern of adding to its cost structure, it has incentivized its buying agents by paying them a margin on the basis of the volumes they deliver to GADC. There is a benefit in overlaying an incentive for Lead Farmers above the commission to buyers; Lead Farmers live among their peers and can influence their peer group in a more meaningful way, through multiple touch-points over the entire growing season – from planting to sales. Buyers on the other hand are incentivized to cover a larger area, and tend to interact with farmers only during the buying period.

The cost of this innovation, both in terms of financial and management costs was minimal. There were no capital investments required, rather a small uptick in operating expenses. The management opportunity cost is slightly higher, but not significant. It does require basic systems to be in place to track and register farmers per Lead Farmer and then circle back at the end of the season to calculate sales per Lead Farmer. Lead Farmers must trust the company and its systems, and the incentive must be paid out fairly to build trust.

This innovation is likely to have impact in any context where a company buys from a large network of farmers either directly or via aggregators. In the case of aggregators, there is a larger question around data systems, and ensuring these are in place to ensure the aggregators are tracking who they are buying from and reporting back to the company. There is a role that technology can play in making this sort of innovation more replicable in contexts without pre-existing systems.

We expect an incentive scheme for Lead Farmers will deliver shared value in a variety of contexts. Impact will depend on several factors, including the type of crop, the local regulatory framework, local market conditions, levels of trust between the company and farmers, the value of the incentive and sales threshold, amongst other factors. Quality of implementation will also influence impact. Key success factors include ensuring that the incentive scheme is clearly communicated, and ensuring that administrative systems to track farmer sales and link them accurately to the Lead Farmer are in place. We recommend a similar scheme be tested first prior to scale up in another context, with close attention to risks and potential adverse effects on farmer welfare (discussed below).

This simple “micro” innovation stands in stark contrast to some of the more complex solutions that were tested through the Coalition. Complex innovations are prone to management challenges and are less likely to deliver the same impact when replicated in different management contexts. Given its simplicity, the chances of successfully replicating this innovation and seeing similar positive impact are high.





Risks and Other Factors to Consider

While this innovation demonstrated strong positive impact in the context of maize in northern Uganda, there are several potential factors and risks that need to be carefully considered when thinking about replication.

Glut. In the absence of a binding contract between farmers and the company that sets price and volume obligations, such an incentive scheme could leave farmers worse off if there is oversupply by farmers or insufficient demand from the company and other buyers. Both situations would likely depress prices and leave farmers worse off. This risk is heightened for cash crops and crops that cannot be stored. To mitigate for this risk, ideally, this sort of incentive should be paired with a contractual obligation for the company to buy predefined volumes at pre-agreed prices but this creates a new set of challenges in contexts where contracts are weakly enforced.² Regardless, it is important that the incentive is carefully crafted to align with the company's objectives and targets in each season.

Food insecurity and adverse gender effects. Maize in northern Uganda, like many other parts of sub-Saharan Africa, is typically planted both for sale and for home consumption. Given the influence that Lead Farmers have on farmers, there is a risk that this incentive could encourage the household to sell more of its

food crop, potentially leading to food insecurity and taking away agency from women, who typically exercise more control over food crops. We did not find evidence to support this hypothesis. During qualitative interviews farmers reported better household outcomes because of increased incomes, with shared decision making on school fees, investing in implements, and household consumption. One farmer reported, "*The marketing (of the maize is) done the same way - my wife and I sit, plan, and budget for how much we will sell.*" While there is no clear evidence of harm to women's agency or to household food security, this is an area which should be carefully considered during the design and evaluation of a similar incentive scheme.

Competitor response. Competitors may respond forcefully by increasing prices. While this is likely to benefit farmers, it may leave the company in a situation where the incentive is ineffective. Ultimately price is one of the foremost factors driving what farmers will plant and who they will sell to. This innovation does not have the power to override this basic principle. We expect that while Lead Farmers have significant influence over farmers' planting and sales decisions, these ultimately will be made within the standard smallholder framework of maximizing profit and food security.

² This will require the company to manage price volatility and risk (e.g., through an offtake agreement).