

2019 Annual Impact: Country Report

May 2020
MEL Report



Summary of Results

At One Acre Fund, we work towards generating holistic impact, which reflects our mission of (1) big harvests, (2) healthy families, and (3) rich soils. We are committed to tracking and measuring profit impact rigorously. After all, farmers invest their hard-earned money with us, and we need to know that they realize a worthwhile return on that investment. Additionally, it's essential to understand that any harvest impact translates to healthier families and that we work to protect soil quality to ensure that farmers can continue to grow profitably, years into the future.

Harvest Improvements

In 2019, One Acre Fund clients improved their harvests compared to non-participating farmers, ranging from a 20% improvement in harvests yields in Tanzania to a doubling of harvests in Uganda. These improvements varied according to weather patterns and soil conditions. On average, however, One Acre Fund farmers in all countries saw significant harvest improvements, even with erratic rainfall patterns.

Harvest improvements translated into an average of \$80 in increased agricultural profit, with an additional \$16 in asset profit from add-on products like trees and solar lights. The average One Acre Fund farmer gained a total of \$96 in extra profit, a 44% boost compared to non-participating farmers. This represents a 6% improvement on last year's profit impact. In 2019, crop selling prices rebounded compared to anomalously low prices in 2018, which helped farmers achieve more substantial profits. However, poorly timed rains meant that overall harvests yields were still relatively low in many areas we work. While One Acre Fund farmers had a profitable year, we want to do better and aim higher.

To help farmers remain profitable over the long term, as they navigate the challenges of climate change and unpredictable crop price volatility, we are adding multiple crops (including cereals, legumes, and vegetables) and new income sources (like poultry and trees) to our packages. We are also offering crop-based crop insurance in nearly all countries, to help alleviate the financial pressures that clients face during difficult seasons.

Hunger Reduction

One Acre Fund firmly believes that those who are in the business of growing food should never go hungry. Reducing hunger and improving nutrition are key prongs of our impact strategy; as a result, One Acre Fund farmers are 25% less likely to report going to sleep hungry in all of our countries of operation, which experience hunger seasons.

However, reducing hunger is not enough. Many One Acre Fund farm families do not get adequate nutrition, which impedes growth and development and makes children more susceptible to illness. Therefore, we have rolled out nutrition programs in each county of operation, where we use marketing and training to encourage farmers to grow and eat nutritious crops. In Kenya, 39% of farmers purchased seed to grow leafy green vegetables while in Rwanda, we have seen a modest but statistically significant improvement in overall dietary diversity.

Soil Health

In addition to big harvests and healthy families, we're also investing in the long-term sustainability of our clients' farms – this means ensuring that the foundation of their prosperity, the soil, remains fertile and healthy for generations to come. To accomplish this, we are focused on increasing crop diversity, tailoring planting recommendations to each local context, promoting compost use, and encouraging the addition of acidity-reducing lime to soils. We've also expanded our agroforestry programs, which help sequester carbon in the soil, prevent erosion, and increase nutrient levels in the soil.

In 2019 we supported more than 900,000 smallholder farmers to plant more than 10 million trees. While we are still refining our soil health metrics, we hope to track such outcomes as the amount of additional carbon One Acre Fund farmers add to their soil, and their use of lime to mitigate soil acidity. The data currently available on agro-biodiversity, as captured by Simpson's Diversity Index, demonstrates that far from concentrating their land holdings on a few crops,

One Acre Fund farmers in most of our countries of operation are diversifying more than their non-participating peers. However, because we expect it to take some time to affect soil conditions and agro-biodiversity, it will be a while before we are able to measure improvements in our newer countries.

Total Program Impact

	Big harvests/profit				Healthy Families ¹	Rich Soils ²
	Total Impact \$/Farmer	Annual Impact \$/Farmer	Asset Impact \$/Farmer	% Increase in Income	% Reduction Hunger	% Change in Agro-biodiversity
Kenya	\$102	\$10	\$10	43%	33%	7%
Rwanda	\$10	\$30	\$30	81%	14%	7%
Burundi	\$4	\$4	\$4	27%	22%	4%
Tanzania	\$6	\$6	\$6	9%	37%	0%
Uganda	\$3	\$3	\$3	27%	0%	0%
Malawi	\$6	\$6	\$6	13%	13%	0%
Zambia	\$0	\$0	\$0	6%	0%	0%
WHOLE PROGRAM (Weighted Average)	\$16	\$16	\$16	44%	24%	6%

Methodology in Brief

Agricultural Profit Impact. To generate our profit impact data, we survey thousands of One Acre Fund farmers and compare that data with similarly situated comparison farmers living in the same area and who therefore face similar agro-ecological conditions. To minimize differences between program and comparison farmers, we get recommendations from One Acre Fund farmers on their friends and neighbors who are interested in joining our program to use as comparison farmers, where possible. We also match comparison farmers and One Acre Fund farmers on characteristics like gender, wealth, household size, and education. This allows us to obtain the strongest comparison possible across as broad a geographic sample as possible.

We conduct two surveys to inform our impact estimate. In the first, we collect comprehensive farming input data on everything from fertilizer and seed cost to labor days expended. We also get an estimate of a farmer’s land size dedicated to One Acre Fund inputs and their land size overall. In the second survey, we randomly select two small plots of land and harvest and weigh each crop. For most crops, we take a “wet” weight of freshly harvested crops, and

¹ Based on multiple year averages. Percent change in hunger is according to the question “Has anyone in your household gone to sleep hungry in the past 30 days?” Percent change in Dietary diversity is according to the Individual Dietary Diversity Scale.

² We are just beginning to systematically collect soil health data across our countries of operation and hope to add to this. Agro-biodiversity is calculating according to the Simpson’s Diversity Index.

subsequently, a “dry” weight – after maize is shucked and dried – which is the weight most relevant to both selling and consumption (in 2019, we took over 25,000 harvest measurements). We then monetize this harvest, based on prevailing local selling prices, to estimate farm revenue. From these two rounds of data collection, we obtain all the information we need to calculate total farmer profit (revenue minus costs) of One Acre Fund farmers and compare it to that of non-participating farmers.

Asset Impact. To understand the impact of our asset products, like solar lights and trees, we similarly collect data from One Acre Fund farmers who adopt these products and those who don’t. For solar lights, for example, we track monthly spending on kerosene, flashlight batteries, cell phone charging, and other related expenditures to understand the amount of savings a solar lamp provides. As much as possible, we randomize the opportunity to adopt a new product so that we can rigorously assess the impact (see [this paper on randomized controlled trials](#) for more information). For these long-term products in which the pay-off is years in the future (as is the case for trees) or accrues for several years (as is the case for solar lights), we discount future benefits.

We capture and transparently report this long-term impact for two key reasons. We see eradicating poverty as being about both: (1) day-to-day income impact – to alleviate the immediate harmful effects of poverty, such as hunger and; (2) long-term asset accumulation that presents more opportunity to get out of poverty entirely.

Healthy Families and Rich Soils

To understand our impact on healthy families, we use a slightly different estimation strategy. We compare farmers who have just entered the program and have yet to realize any harvest or profit impact, with those who have been in the program in previous years. Because both groups have self-selected into the program, this minimizes any self-selection bias that could influence our estimates. We regularly collect data on hunger, dietary diversity, and asset accumulation. In this report, we are only presenting data on the impacts of hunger. We have improved dietary diversity – a leading indicator for childhood malnutrition – in a few countries thus far. Still, we expect our ramped up nutrition efforts to yield even better results in the coming years. We hope to present the impact on asset accumulation as we gain further insights with the benefit of future data.

To understand our impact on rich soils, we compare One Acre Fund farmers to non-participating farmers controlling for observable differences. While we are still refining our measurement strategy, in the interim, we are collecting information on additional carbon, lime application, erosion mitigation, and agro-biodiversity. These measurements are all based on self-reported data on various farming practices. We only have multiple years of data for agro-biodiversity at the point, which is what we present in this report.

Kenya Impact 2019

Country Context: The Kenya program, launched in 2006, is One Acre Fund’s oldest program. We primarily support farmers in growing maize and beans over one long season, with credit for both improved seed and fertilizer and frequent training. We offer a range of additional add-on products, such as solar lights, vegetable seeds, improved crop storage bags, cook stoves, and sanitary pads. Kenya has a robust innovations laboratory with a large pipeline of new agricultural and other products, such as poultry, new organic soil matter interventions, and maize harvest buy-backs. In 2019, we served over 408,000 farmers.



Impact Results and Trends: We added **\$92** in annual agricultural profit on average over the [long rains] season we worked with farmers in Kenya. Add-on products, e.g., trees, kale, and solar lamps, added another **\$10** to our average impact. Altogether, this represents a **43%** improvement in profits relative to a comparison group. Total profit impact for One Acre Fund farmers nearly doubled relative to the 2018 impact, which was one of our lowest years on record – mainly due to historically low maize selling prices. In 2019, we recovered much of this impact due to a dramatic strengthening of maize prices.

Over the years, we have driven down self-reported hunger by **33%** compared to non-participating farmers, and improved overall agro-biodiversity, partially through an extensive tree program. To further address hunger and malnutrition, the Kenya program is working with several partners to run marketing and behavior change campaigns that encourage healthy diets and joint decision making between spouses. Last year, 39% of farmers purchased seed to grow leafy green vegetables. We have also recorded an improvement of agro-biodiversity of **7%**. To help improve soil health, we continue to train on composting and supplying lime to help improve soil acidity.

Rwanda Impact 2019

Country Context: The Rwanda program, launched in 2007, is One Acre Fund's second-oldest program. We serve farmers across a broad swath of the country, providing fertilizer on credit and frequent training over two growing seasons. Farmers most commonly grow maize, climbing beans, bush beans, potatoes, and rice. We offer a range of additional add-on products such as solar lights, cookstoves, and have an active agroforestry program. In 2019, we served 383,000 farmers.



In addition to our core program, we support farmers nationwide through government partnerships that help bring high-quality agricultural extension training to every village in the country and bring fertilizer to a large network of agro-dealer sellers. What is more, we are working with the government to develop the seed sector in Rwanda and ensure the best varieties are grown and available locally in Rwanda.

Impact Results and Trends: We added **\$88** in agricultural profit over the two growing seasons from our core program. Add-on products (trees and solar lamps) added another **\$30** to our average impact to represent a similar impact from the previous year. Altogether, this **\$118** of impact represents an **81%** improvement in profits relative to a comparison group. Rwanda achieves higher percent improvements than many other countries because the baseline profit is relatively low.

Over the past several years, One Acre Fund has improved self-reported hunger by **14%** on average compared to non-participating farmers. In addition to training farmers on healthy diets and kitchen gardens, we are supporting farmer nutrition by driving the supply and adoption of biofortified, iron-rich beans across Rwanda. We estimate an average improvement of **7%** in terms of agro-biodiversity in Rwanda, which is likely due to multiple years of tree offerings. Soil acidity is a challenge in many parts of Rwanda, and we're continually testing new marketing and behavioral strategies to improve the adoption of lime in the most acidity-prone areas.

An important piece of context is that non-participating farmers have improved access to training through farmer promoters and inputs through agro-dealers, both of which One Acre Fund plays a role in supporting. The One Acre Fund program also has very high penetration in most areas, with farmers typically cycling in and out of the program. There are some areas in which it is challenging to find comparison farmers who have not been in the program, and those who have

not might have picked up farming practices from nearby participating farmers. While all of this represents a measurement challenge, we view this “whole market” strategy overall as great news for farmers nationwide.

Burundi Impact 2019

Country Context: Burundi, launched in 2011, is our third country program. We support farmers to grow maize, beans, and potatoes over two seasons, with credit for fertilizer and training. The government subsidizes fertilizer costs, so many farmers use it for core crops, coffee, and tea. Our primary programmatic advantage is, therefore, our intensive training, which helps farmers gain better yields without spending much more on inputs than their neighbors – sometimes they even spend less by applying seeds more efficiently. We also offer solar lights, grain storage bags, trees, and hybrid maize seed. In 2019, we served over 104,000 clients.

Impact Results and Trends: We added an average of **\$30** in agricultural profit over the two seasons. We further estimate that add-on products (trees and solar lamps) added another **\$4** per farmers on average. The impact of add-on products is lower than in our other countries of operation because we were unable to distribute trees to all farmers in 2019. However, we have resumed our tree program in 2020. It is difficult to assess the trend in impact from the prior year since the Burundi program did not operate at full scale in 2018, so we were unable to measure the impact precisely that year. In sum, this **\$34** of impact represents a **27%** improvement in profits relative to a comparison group. Because fertilizer is subsidized and widely available in Burundi, most of our impact comes from training on improved farming practices, which can limit the magnitude of our footprint in that context. However, given the depth of poverty in Burundi, a 27% improvement in profits has significant implications for material well-being.



Over the past several years, One Acre Fund has noted an improvement in self-reported hunger by **22%** on average compared to non-participating farmer hunger indices. We are working to enhance farmer nutrition by testing orange-fleshed sweet potatoes biofortified with vitamin A, and by offering a mix of nutritious vegetables. Also, we estimate an average improvement of **4%** in agro-biodiversity in the country. In 2020, we are planning to pilot a community-level training and behavior change campaign around erosion control for improved soil health.

Tanzania Impact 2019

Country Context: One Acre Fund’s Tanzania program launched in 2013. We support farmers to grow maize over one long season, with credit for both improved seed and fertilizer and frequent training. We provide optional add on products to improve farmer impact beyond maize, such as solar lights and improved harvest storage (PICS) bags. In 2018, we began offering non-maize fertilizer and training for conventional crops such as potato, sunflowers, beans, and tomatoes. The average farm size in Tanzania is bigger than in the other countries where we operate, and oxen use is more common, which compels us to think more creatively about our planting training. In 2019, we served 56,000 farmers.

Impact Results and Trends: In 2019, despite challenging weather conditions, we added an average of **\$53** in agricultural impact and another **\$6** of asset impact from maize storage bags and trees. This was a marked improvement over 2018, mainly due to stronger maize harvests and a rebound in commodity prices. To reduce impact volatility from an over-reliance on maize, Tanzanian clients received targeted fertilizer options and training on nine additional common crops. In total, this impact represented a **9%** improvement in profit relative to non-participating farmers. Due to the relatively higher land sizes for Tanzanian farmers, we typically do not report significant average yield/profit improvements compared to other one Acre Fund countries.

Over the past several years, One Acre Fund has improved self-reported hunger by about 37% – we note, however, that overall hunger levels are quite low in the areas in which we work in Tanzania. Still, malnutrition, particularly iron and

vitamin A deficiency, is high, and we are exploring a partnership to fortify maize flour at small-scale mills to improve farmer nutrition. While we have not yet enhanced agro-biodiversity, a trial-stage avocado tree program holds the promise for a high return on investment for farmers who adopt that product. And, following successful trials in 2019, we will be making agricultural lime available to all farmers in 2021. Overall these efforts promise to reduce vulnerability to price fluctuations on any one crop while also allowing for improved farmer nutrition, a reduced pest and disease load, and increased soil health.

Uganda Impact 2019

Country Context: We launched our Ugandan program in 2017. Farmers get a package for maize support, which includes seed and fertilizer, as well as add-ons such as solar lights, drying sheets – to dry and maintain product quality during post-harvest handling, and PICS bags to safely store maize. The program typically covers the long rains growing season. In 2019, we served some 8,000 farmers.



Impact Results and Trends: In some respects, Uganda is one of our most successful programs, regularly *Xn/Ujb`* yields compared to non-participating farmers. 2019 was no exception: we improved yields by 104%. However, farmers in our program areas in Uganda do not typically use improved seeds and fertilizer, so the program is relatively expensive (compared to what farmers would otherwise do). Therefore, despite doubling yields, we measured only a modest improvement of **\$16** in agricultural profit and **\$3** in add-on asset profit (e.g., from trees and solar lights). This impact represents a decline relative to the previous year, partly because we reduced the overall package size to better respond to the needs of the farmers in our area. This reduction in agricultural package size has improved overall program performance but limited total profit impact. Still, the **\$19** impact represents a **27%** improvement compared to non-participating farmers. In 2019 we also trialed a lower fertilizer rate package, which has the potential to reduce farmer costs with no substantial reduction in yield. We are scaling this across the program in 2020.

We have yet to measure any improvements in hunger or agro-biodiversity in Uganda. However, we continue to work towards a program model that is attractive to farmers and has a high return on their investment in terms of harvests, profits, hunger, and soil health. In the upcoming season, we are offering a more diverse and flexible catalog of products to support beans, groundnuts, and bananas. In the next year, we plan to market and sell iron-rich beans to farmers and deliver nutrition training.

Malawi Impact 2019

Country Context: We launched operations in Malawi in 2017. Farmers receive a maize support package that includes seed and fertilizer, as well as the option to purchase solar lights. The Innovations team is also trialing sorghum, pigeon peas, and groundnuts, which are planned to be offered in subsequent seasons. In 2019, we served over 25,000 farmers.

In addition to our regular program, One Acre Fund has been partnering with the Malawian government to enhance agricultural extension programs in several districts. This program has shifted towards a tree



