

2020 Annual Impact: Country Report

May 2021
MEL Report



Summary of Results

At One Acre Fund, we continually seek to understand our impact holistically, which echoes our mission of achieving (1) big harvests/profits, (2) healthy families and (3) rich soils. We are committed to continue to rigorously track and measure profit impact. After all, farmers invest their hard-earned money into the program and we need to know that they are realizing a return on their investment. It's also important to us that any harvest impact translates to healthier families, and to know that we are protecting soil health to ensure that farmers can continue to grow profitably years into the future.

Big Harvests/Profit

In 2020, One Acre Fund clients improved their maize harvests per acre by 24% on average compared to non-participating farmers — ranging from an 18% increase in Zambia to 74% in Uganda. These harvest improvements varied according to weather patterns and soil conditions and came despite disruptions to service delivery because of COVID.

Harvest improvements translated into an average increase of \$62 in agricultural profit, with an additional \$19 in asset profit from add-on products like trees. The average One Acre Fund farmer gained a total of \$81 in additional profit, a 33% boost compared to non-participating farmers.

To help farmers continue farming profitably over the long term, as they also navigate the challenges of climate change and unpredictable crop prices, we have added multiple crops (including cereals, legumes, and vegetables) and new income sources (like poultry and trees) to our full-service packages. We are also offering index-based crop insurance in all countries to help ameliorate the financial pressures that clients face during difficult seasons.

Healthy families

One Acre Fund firmly believes that those who are in the business of growing food should never go hungry. A reduction in hunger and improvement in nutrition are key prongs of our impact strategy. Hunger in the areas where we work does not always look the same. Farm families may go to bed hungry, skip meals, eat foods they don't desire, or simply worry about getting enough to eat in the coming week. In 2020, we estimated the degree of hunger in each of our program countries using the Food Insecurity Experience Scale (FIES), which best captures these various types of food insecurity experiences. In every country, we measured an improvement in FIES, comparing returning One Acre Fund farmers with those who'd newly joined the program and had yet to experience an improved harvest.

Reducing hunger alone is not enough. Many One Acre Fund farm families do not get adequate nutrition, which stymies the growth and development of children, and makes them susceptible to illnesses. In response, we have rolled out targeted nutrition programs in which we use marketing and training to encourage farmers to grow and eat nutritious crops. Subsequently, in Kenya, 41% of farmers purchased vegetable seed while, in Rwanda, we registered a modest but statistically significant improvement in overall dietary diversity.

Rich Soils

In addition to big harvests and healthy families, we're also investing in the long-term sustainability of our clients' farms. Specifically, we're ensuring that the foundation of farmers' prosperity — the soil — remains fertile and healthy for generations to come. To accomplish this, we have focused on increasing crop diversity, tailoring planting recommendations to each region's 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 soil nutrient levels.

In 2020 we supported more than 1.6 million smallholder farmers to plant more than 24 million trees. While we are still refining our soil health metrics, we are hoping to track such outcomes as the amount of additional carbon One Acre Fund farmers add to farmers' soils, and their additional use of lime to mitigate soil acidity. We currently have multiple years of data on agro-biodiversity captured by Simpson's Diversity Index, and we find that far from concentrating their land holdings in a few crops, One Acre Fund farmers in many countries are actually diversifying land more than their non-participating peers.

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 in Food Insecurity	% Change in Agro-biodiversity
Kenya	\$71	\$58	\$13	24%	12%	9%
Rwanda	\$102	\$78	\$24	49%	12%	10%
Burundi	\$75	\$35	\$41	54%	24%	2%
Tanzania	\$51	\$47	\$4	17%	1%	0%
Uganda	\$24	\$20	\$4	28%	20%	0%
Malawi	\$24	\$22	\$2	12%	8%	0%
Zambia	\$39	\$39	\$0	6%	8%	0%
WHOLE PROGRAM (Weighted Average)	\$81	\$62	\$19	33%	13%	8%

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 who live in the same area and thus 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, where possible. We also match comparison farmers and One Acre Fund farmers on characteristics like gender, wealth, household size, and education when we have large enough samples. This allows us to obtain the strongest comparison possible across as wide a geographic sample as possible.

¹ Based on the Food Insecurity Experience Scale. This scale comprises nine questions which ask farmers about their experience with food insecurity in the past 30 days, and allows us to estimate the percentage of farmers who are experiencing moderate or severe food insecurity.

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 calculated according to Simpson's scale.

We conduct two surveys to inform our impact estimate. In the first survey, 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 as a portion of their overall land size. In the second survey, we randomly select two small plots of land, then harvest and weigh each crop. For most crops, we take a "wet" weight of freshly harvested crops and a "dry" weight, after maize is shucked and dried, for example, which is the weight most relevant to both selling and consuming the grain (in 2020, we took nearly 20,000 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 get all the data we need to calculate total farmer profit (revenue minus costs) of One Acre Fund farmers, which we then compare to that of non-participating farmers.

2020 was a challenging year for data collection due to COVID, and we had to collect some of our data over the phone rather than in person. Nevertheless, we still obtained harvest measurements in the field in all countries except for Tanzania, where we relied on self-reported harvest measurements.

Asset Impact: To understand the impact of our products that accrue value over time, such as solar lights and trees, we similarly collect data from One Acre Fund farmers who adopt these products and those who do not. We estimate future benefits and then discount them to a net present value. With trees, for example, we survey participating and non-participating farmers by counting how many trees they have planted in a year and estimating the impact of program participation on incremental trees planted. We then conduct extensive household surveys to understand how farmers use each tree species over a 10-12-year time horizon (e.g. for firewood, fence poles, to sell as timber etc.). To complement the data we collect, we survey vendors to estimate how much we expect farmers to earn from each tree species over the life of the tree.

As much as possible, we randomize the opportunity to adopt a new product so that we can most rigorously assess the impact (see [this paper on randomized controlled trials](#) for more information). For long-term products whose pay-off is years in the future or accrues for several years (as is the case for trees), we discount future benefits.

We feel it is important to capture and transparently report out this longer term impact because we understand that eradicating poverty is about both: (1) day-to-day income impact that alleviates 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 family health and well-being, we use a slightly different estimation strategy, where 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 for more than one year. Because both groups have self-selected into the program, we minimize any self-selection bias that might influence our estimates. We regularly collect data on hunger, dietary diversity and asset accumulation. This report presents data on hunger and asset impacts. We have improved dietary diversity (a leading indicator for childhood malnutrition) in a few countries so far, but expect our ramped up nutrition efforts to yield even better results in future years.

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

Kenya Impact 2020

Country Context: The Kenya program, launched in 2006, is One Acre Fund's oldest. We primarily support farmers to grow maize and beans over one long season, with inputs credit for both improved seed and fertilizer, and training. We offer a range of additional 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 associated products, such as poultry, new organic soil matter interventions, and maize harvest buy-backs. In 2020, we served nearly 500,000 farmers over the "long rains" growing season.



Impact Results and Trends: We generated an additional **\$58** in annual agricultural profit on average. Add-on products (like trees, kale, and storage bags) added another **\$13** to our average impact. Altogether, this represents a **24%** improvement in profits relative to a comparison group. To reach as many farmers as possible, we allowed farmers to join the program even if they did not sign up for our maize package, which is our most profitable offering. While this lowered our total average impact by about \$17, it meant that we could reach a larger range of farmers in Kenya.

According to the Food Insecurity Experience Scale, we reduced moderate-to-severe food insecurity in Kenya by **12%** and severe food insecurity by **22%**. Participating farmers also improved their agro-biodiversity in part because of our large tree program. To further address hunger and malnutrition, the Kenya program is working with several partners to run marketing and behavior change campaigns aimed at encouraging healthy diets and joint decision making between spouses. Last year, 41% of farmers purchased seed to grow leafy green vegetables. We also measured an improvement of agro-biodiversity of **9%**. To keep improving soil health, we continue to train farmers on composting and offer lime to help reduce soil acidity.

Rwanda Impact 2020

Country Context: The Rwanda program, launched in 2007, is One Acre Fund's second-oldest. We serve farmers across a broad swath of the country, providing fertilizer on credit and frequent training over two growing seasons each year. Farmers most commonly grow maize, climbing beans, bush beans, potatoes, and rice. We offer a range of add-on products such as solar lights and cookstoves, and have an active agroforestry program. In 2020, we served over 450,000 farmers.



In addition to the core program, we support Rwandan farmers nation-wide through government partnerships that help bring high-quality agricultural extension training to every village in the country, and fertilizer to a large network of agro-dealer sellers. In addition, we collaborate 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 created an additional **\$78** in agricultural profit over two growing seasons in 2020. Add-on products (trees and maize storage bags) added another **\$24** of impact, which reflects a similar trend from the previous year. Altogether, this **\$102** of impact represents a **49%** improvement in profits relative to a comparison group. Rwanda achieves higher percentage improvements than many other countries because the country's baseline profit is relatively low.

Per the Food Insecurity Experience Scale, participating farmers saw a reduction in moderate-to-severe food insecurity of **12%** and a reduction in severe food insecurity of **3%**. In addition to training farmers on healthy diets and kitchen gardens, we are supporting farmer nutrition by driving supply and adoption of biofortified iron-rich beans across Rwanda. We estimate an average improvement of **10%** in agro-biodiversity, which is likely due to multiple years of tree offerings. Soil acidity is a challenge in many parts of the country, and we're continually testing new marketing and behavioral strategies to improve adoption of lime in the most acidity-prone areas.

An important piece of context is that non-participating farmers gained improved access to training through farmer promoters, and to inputs through agro-dealers, both of which One Acre Fund supports. The One Acre Fund program, known as Tubura in Rwanda, also has a very high penetration rate in most areas, and farmers typically cycle in and out of the program. For this reason, it is very difficult to find comparison farmers who have not been in the program before, and those who have not enrolled before 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 2020

Country Context: One Acre Fund Burundi, launched in 2011, is the organization's third largest country program. We support farmers to grow maize, beans, and potatoes over two seasons annually, through offering credit for maize seed and fertilizer, as well as training. The government subsidizes fertilizer costs so our primary programmatic advantage is our intensive training, which helps farmers gain better yields without having to spend extra on inputs (sometimes they even use less fertilizer due to efficient application). We also offer solar lights, grain storage bags and trees. In 2020, we served over 105,000 farmers.



Impact Results and Trends: We added an average of **\$35** in agricultural profit over the two seasons of 2020. We further estimate that add-on products (such as trees and solar lamps) added another **\$41** per farmer on average. Much of this additional impact came from a tree program that had been suspended the prior year (the pent up demand saw high tree adoption in 2020). Altogether, this **\$75³** impact represents a **54%** improvement in profits relative to a comparison group. The large percentage improvement in profits is due, in part, to the very low baseline profit realized by Burundian farmers, who are some of the poorest farmers on the planet.

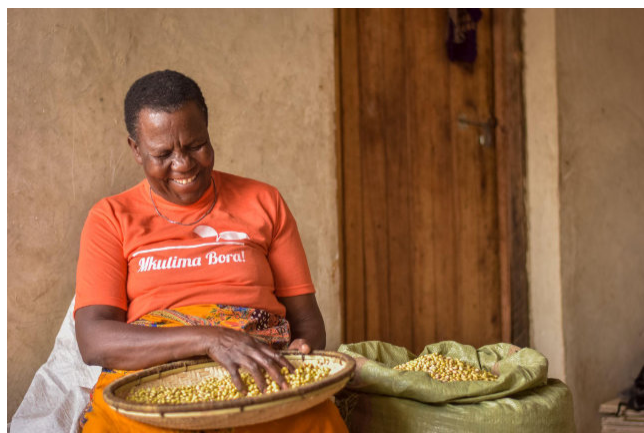
According to the Food Insecurity Experience Scale, participating farmers saw a reduction in moderate-to-severe food insecurity of **24%**. The *overall* level of hunger estimated by this scale was significantly lower than what other researchers

³ \$35 of agricultural impact and \$41 of asset impact totals \$75 due to rounding. The more precise totals are \$34.62 in agricultural impact, \$40.63 in asset impact and \$75.25 in total impact.

found. As a result, we have refined our translation and training of this survey and hope to get even more accurate estimates of hunger reduction in 2021. We are working to improve farmer nutrition by testing orange-fleshed sweet potatoes biofortified with vitamin A, and by offering a mix of nutritious vegetables. Additionally, we estimate a modest improvement of **2%** in agro-biodiversity in the country, but we have started to see improvements in preventing soil erosion (**11%** reduction in soil erosion loss compared to non-participating farmers), which is an increasing focus for our program in hilly Burundi.

Tanzania Impact 2020

Country Context: We launched the Tanzania program in 2013. We support farmers to grow maize over one long season, by providing them with improved seed and fertilizer on credit, and conducting frequent training. We provide optional add on products to improve farmer impact beyond maize, including solar lights and improved harvest storage (PICS) bags. In 2018, we began offering non-maize fertilizer and training for common crops such as potato, sunflowers, beans and tomatoes. The average farm size in Tanzania is greater than in other countries where we operate, and oxen use is more common than in our other countries, which compels us to think more creatively about our planting training. In 2020, we served 56,000 farmers.



Impact Results and Trends: In 2020, despite challenging weather conditions, such as flooding in some parts of the country, we added an average **\$47** in agricultural impact and another **\$4** of asset impact from maize storage bags and trees. Much of this impact came from farmers' use of One Acre Fund fertilizer and practices on non-maize crops, and reflected a similar impact to 2019. To reduce impact volatility from an over-reliance on maize, we offer our Tanzanian clients targeted fertilizer options and training on nine additional common crops. Altogether, this impact represented a **17%** improvement in profit relative to non-participating farmers. Due to the greater land sizes of Tanzanian farms, we typically do not see as large a percentage improvement compared to other one Acre Fund countries.

Per the Food Insecurity Experience Scale, participating farmers saw a reduction in moderate-to-severe food insecurity of a modest **1%** and a reduction in severe food insecurity of **6%**. Overall, hunger levels are quite low in the areas in which we work in Tanzania, so it is more difficult to estimate the more dramatic impacts on hunger that we find in other countries of operation. Still, malnutrition, particularly of iron and vitamin A deficiency, is high, and we are currently trialing two types of iron fortified beans. While we have not yet improved agro-biodiversity, we estimated that One Acre Fund farmers input 30% more carbon in their soil relative to non-participating farmers, likely the result of training that discourages field burning and encourages composting. In addition, an agroforestry program offering fruit, timber, and soil health trees to clients holds promise for high return on investment for farmers who adopt these products. Following successful farmer-facing trials in 2019, we have made agricultural lime available to all farmers in 2020. Altogether, these efforts promise to reduce vulnerability to price fluctuations on any one crop while also allowing for improved farmer nutrition, reduced pest and disease load, and increased soil health.

Uganda Impact 2020

Country Context: The Uganda program was officially launched in 2016. We offer farmers a maize bundle that includes seed and fertilizer, and add-on products that include banana inputs, groundnuts, beans, solar lights, drying sheets to dry and maintain produce quality during post-harvest handling, and PICS bags to safely store maize. The program typically

non-participating farmers, and another **\$2** from trees; altogether, this represents a **12%** boost in profit. In 2021, the Malawi team is exploring opportunities to connect smallholder farmers to commercial markets, and support them in diversifying to other crops that they can plant.

According to the Food Insecurity Experience Scale, participating farmers saw a reduction in moderate-to-severe food insecurity of **8%**, and a reduction in severe food insecurity of **20%**. In the 2021 season, the Malawi team will explore opportunities to encourage more profitable and efficient levels of fertilizer application, connect smallholder farmers to commercial markets, and support farmers as they diversify the crops that they plant.

Zambia Impact 2020

Country Context: Our Zambia program is still a pilot country and has not officially “launched”. In 2020, we served over 19,000 farmers. Zambia is unique among our countries of operation in that it is more sparsely populated and farmers cultivate a lot more land. Instead of purchasing loans for ½ - 1 acre of inputs as do most One Acre Fund farmers, Zambian farmers take out an average of 3.5 acres worth of inputs. The impact potential is therefore quite large, as is the potential for One Acre Fund’s financial sustainability. In 2020, farmers were offered a package for maize, soya, and groundnuts, which includes seed and fertilizer, two tree species as well as the option to purchase solar lights.



Impact Results and Trends: As our newest country, we have struggled to realize the same depth of profit impact as in other countries. Still, in 2019, we estimated a profit impact of **\$39** relative to non-participating farmers. The bulk of this impact was due to the ability of One Acre Fund farmers to cultivate more of their land than non-participating farmers, thanks to access to affordable credit. Given the very large land sizes and profit margins, this \$39 represented a **6%** increase relative to non-participating farmers.

According to the Food Insecurity Experience Scale, participating farmers saw a reduction in moderate to severe hunger of **8%** and a reduction in severe food insecurity of **12%**. Given that over half of Zambian children have vitamin A deficiency, we have been conducting formative research on biofortified vitamin A orange maize and intend to offer this crop next season. We are also running discussion-based trainings on healthy diets and child care.