



2015 Nuru Ethiopia Agriculture Program Impact Assessment

September 2016

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Executive Summary

In 2015, Nuru Ethiopia (NE) Agriculture generally achieved its aims of increasing crop yields and agricultural income. 2015 was a challenging year for smallholder farmers throughout Ethiopia. Thanks to NE cooperatives, member farmers who received Nuru's agriculture intervention fared better than comparison farmers.

1,439 farmers across nine cooperatives produced maize, haricot beans, teff and wheat as a result of access to improved farm inputs on loan, technical training, extension services and group support structures provided by NE Agriculture. Crop production varied among farmers over two rainy seasons in 2015, with loan packages valued at an average of \$89 USD.

The 2015 production year took place in the context of the most extensive and severe drought Ethiopia has experienced in the last 50 years:

- At the height of the drought in 2015, food insecurity enveloped upwards of 10.8 million people in Ethiopia, representing the biggest population of food insecure people on Earth.
- The farmers from intervention and comparison groups surveyed in this study, including those residing in lowland areas, were moderately to severely impacted by this drought. While Nuru farmers increased yield and incomes, the overall shock of drought on farmers' livelihoods was severe enough to put households at risk of resorting NE implemented a \$95,000 USD cash transfer program to the most affected households and provided risk reserves to cooperatives to assist farmers with flexible payment terms on loans. These measures stabilized households that otherwise may have resorted to much more damaging and long-lasting recourse such as selling off productive assets, their land and homes, or moving away.

This context and the activities of NE's response shape the environment within which this impact assessment occurred.

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Key findings of this report:

1. **The program is working.** NE's agriculture intervention helped households achieve substantially and significantly higher incomes and crop yields than the non-intervention comparison.
2. **Nuru farmers are harvesting more than non-Nuru farmers.** Nuru farmers increased crop yields by 36 percent over their baseline and 78 percent as compared to the non-intervention group.
3. **Nuru farmers are realizing more profit than non-Nuru farmers.** Nuru farmers increased profits by 85 percent compared to the non-intervention group. However, Nuru farmers did not increase profit compared to their own pre-intervention baseline.
4. **Farmer food security levels are low.** Nuru farmers experienced levels of food insecurity of 2 percent, a level similar to the comparison non-intervention group. Changes in food security were not picked up by the results. While M&E will continue to use the Household Hunger Survey method, it will also explore alternative methods of measuring food security to verify impact on this metric.
5. **Increase risk management strategies.** The program is tracking towards consistently increasing crop yields and agricultural income, which reinforce the principle activities being carried out by the program. However, the program should work to increase its risk management strategies.

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Introduction

Nuru Ethiopia (NE) Agriculture aims to impact crop yield, food security and household income by providing member farmers with a farm input loan, technical training, extension services and group support structures. The Nuru Monitoring and Evaluation (M&E) team supports this work by conducting annual reviews of progress toward the program's impact goals to address the evaluation question: ***What is the impact of the Nuru Ethiopia Agriculture?***

Objective

2015 was the second year of agriculture intervention in Ethiopia. In the inaugural 2014 year, NE capitalized on lessons learned during Nuru Kenya's (NK) five years of implementation. Specifically, NE Agriculture worked to introduce crop diversification, and in 2015 expanded the crop offerings to include teff and wheat. Data were collected from the farmers at a baseline time point in April 2014 and two follow-up time points in November 2014 and November 2015. The following analysis of the household level data collected intends to shed light on the following question: ***What is the impact of Nuru Ethiopia Agriculture on participating farmer households versus non-participating farmer households?***

The impact of NE Agriculture is determined by measuring crop yields, food security and agriculture income. Building off similar surveys conducted in Kenya in 2012 and 2013, M&E collected information about farmers involved in NE Agriculture (intervention group) and those who were not (comparison group) in terms of their overall household production and its impact on household hunger.

Methodology

In April 2014, NE conducted a baseline study of its first cohort of farmer households across five *kebeles* within Boreda woreda, Gamo Gofa Zone, Southern Nations, Nationalities and Peoples' Region (SNNPR). The sampling frame was geographically and randomly stratified by kebele and then village to ensure that a sufficient number of farmers were represented in each stratum for comparison across categories.

For the 2014 survey, M&E sampled five *kebeles* within Boreda woreda: Dubana Bulo, Hambisa, Meteke Mele, Kodo Awisato Menuka and Dugana Gamera. The former three *kebeles* were participants in programming, whereas the latter two were non-intervention comparison areas.

Follow up assessments were conducted in November of 2014 and April of 2015 of both Nuru and comparison farmer households.

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In order to begin a time series assessment that will capture the changes that take place as a result of Nuru programming, M&E will survey the same farmers — Nuru farmers and comparison farmers to show the absence of Nuru intervention over time — at each time point. If a farmer is not surveyed at a follow up time point, s/he will be dropped from all previous datasets to ensure data integrity. Nuru intends to follow these farmers and continue to survey each household through 2017.

Table 1: Survey Timeline and Sample Sizes

Cohort	Kebeles	Baseline	Follow up 1	Follow up 2	Sample size
Nuru	Dubana Bulo, Hambisa and Meteke Mele	Apr 2014	Nov 2014	Apr 2015	390
Comparison	Kodo Awisato Menuka and Dugana Gamera	Apr 2014	Nov 2014	Apr 2015	444

Given the need to compare the production of different crops at separate time points, M&E used a crop equivalent yield (CEY) approach to track progress over time — essentially converting the production of maize, haricot beans, teff and wheat into “maize equivalent units.” Similar to its approach for Nuru Kenya (NK), M&E measured household hunger levels in Ethiopia using USAID’s Household Hunger Scale¹ and calculated agricultural income based on the theory developed from farm gross marginal analysis, which is a tool utilized for planning agricultural investments. The same farmer households were tracked across both time points, which is the main difference in methodology between NK and NE Agriculture to date. See the appendix for more information.

Results and Discussion

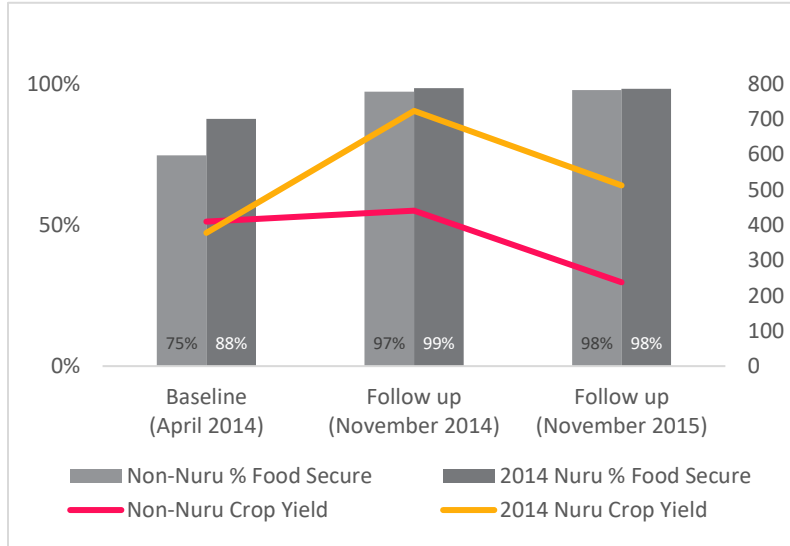
NE’s agriculture intervention helped households achieve substantially and significantly higher incomes and crop yields than a non-intervention comparison. In 2015, Nuru farmers increased crop yields by 78 percent and agricultural profitability by 85 percent compared to a non-intervention comparison group. Moreover, compared to their own baseline, Nuru farmers

¹Ballard, Terri; Coates, Jennifer; Swindale, Anne; and Deitchler, Megan. Household Hunger Scale: Indicator Definition and Measurement Guide. Washington, DC: FANTA-2 Bridge, FHI 360.

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increased crop yields by 36 percent. This crop yield increase surpasses the target benchmark of 32 percent, meaning the program hit its target in 2015.

Figure 1: Crop Yield (kgs/acre) and Food Security of Nuru and Comparison Farmers²



However, results also demonstrate the depressing effect that the severe drought had on crop yields. In absolute terms and within the context of a drought that negatively impacted other aspects of farmers' livelihoods, crop yields were inadequate.

Food security measures noted no significant difference between Nuru and comparison groups during 2015. Levels of food insecurity were reported at 2 percent for both intervention and non-intervention groups.

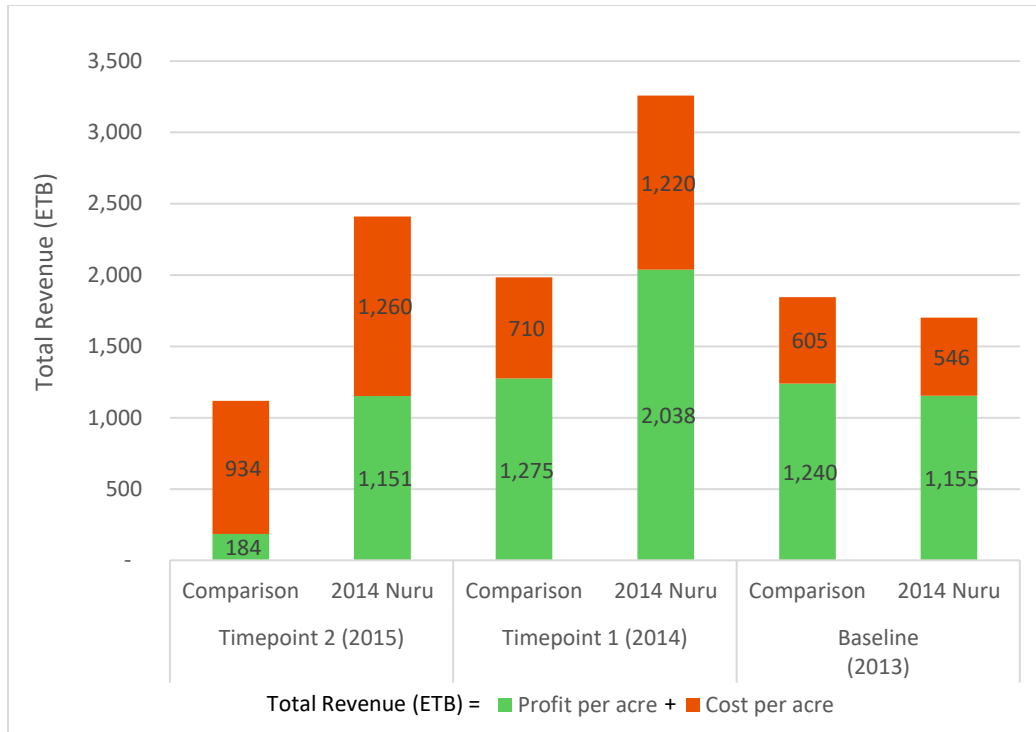
Income Model

Figure 2 illustrates total revenue, profits and costs for Nuru and comparison farmers. Overall revenue is shown as the sum of profit (in green) and costs (in red). This graphic contextualizes Nuru farmers' revenue and profitability, given the increased costs of Nuru farming methods compared to baseline methods and a non-intervention group.

Figure 2: Total Revenue, Costs and Profits per Acre

² Follow up (Nov 2014): Food security data are average of Nov 2014 plus April 2015 time points.
Follow up (Nov 2015): Food security data are average of Nov 2015 plus April 2016 time points.

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Since baseline, Nuru farmers experienced an increase in profits of 85 percent as compared to comparison farmers in 2015. In absolute terms, Nuru farmers profited \$58 USD in 2015 as compared to the profit of \$9 USD by comparison farmers.³ Nuru farmers did not experience profitability over their baseline. In other words, their profit was unchanged from pre-intervention to 2015 intervention point, despite experiencing increases in 2014. In this regard, the intervention in 2015 helped Nuru farmers better deal with a drought year compared to the non-intervention group, but it was not a prosperous year by any measure, much less their own baseline.

Conclusion

In 2015, Nuru Ethiopia Agriculture generally achieved its aims of increasing crop yields and agricultural income. 2015 was a challenging year for smallholder farmers throughout Ethiopia. Thanks to NE cooperatives, member farmers who received Nuru's agriculture intervention fared better than comparison farmers.

In absolute terms, 2015 was a difficult year for many farmers across Ethiopia. As a result of mounting food insecurity and to stabilize the intervention farmer population, NE cooperatives offered cash transfers in the amount of \$95,000 USD distributed amongst the worst impacted farmers. The primary intent of this cash transfer was to guarantee that farmer livelihoods could

³ \$1 USD = 20ETB

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be sustained through a difficult period and Nuru farmers would continue to participate in cooperatives and continue on the path out of poverty. Therefore, while yields of Nuru farmers increased relative to comparison farmers, and so the program was effective to this end, in absolute terms Nuru farmers still found themselves in need of assistance.

Another element of programming was the diversification package which included teff and wheat, in addition to maize and beans. While the primary idea in introducing more crops was to spread out risk and increase income, the overall result increased the debt burden on farmers while compounding risk for them and the organization. While yields for these crops increased over baseline, their overall performance in absolute terms of kilograms of maize created challenges for input loan repayment. As a result, NE introduced risk reserves to assist farmer cooperatives by vesting them with a pool of funds that could be used by farmers to pay off loans this season and then replenish the fund over a period of several years. A second decision based on these data was to eliminate teff and wheat from the loan package until there is a better system to manage the complexity and compounded risk that they introduced.

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In the future, NE will need to bolster its risk management strategies overall:

- **Risk Reserves:** Building up risk reserves through cooperatives was a strong initial measure, but its long-term success hinges on whether the funds can be sustainably replenished. With the cyclical nature of drought in Ethiopia, this is not assured. NE should further develop this strategy for cooperative risk reserves. At the household level, the Financial Inclusion Program is working to increase savings behavior as a risk reserve measure.
- **Risk Reduction:** Lowering the amount of loans proved to be another positive measure for risk management, however it does not provide an outlet to continue towards achieving the goal of increasing farmer income. The findings from the 2015 season demonstrated a lesson that over-dependence of the cooperative business on rain-fed agriculture is not a reliable strategy for the business.
- **Prudent Risk-Taking:** Introducing income opportunities through livestock, small ruminants and other activities could cut some dependency on rain-fed agriculture and better address the overall goal of increasing income while also diversifying risk. These activities will largely take place through the Financial Inclusion Program.
- **Risk Transfer:** Crop insurance remains an extraordinarily difficult measure to enact in Ethiopia because the sector offerings in Ethiopia have been extremely limited, and financial institutions are more hesitant than ever after the 2015 drought experience. In the absence of risk transfer through crop insurance, NE provided cash transfers to farmer households. Follow-up monitoring on the cash transfer demonstrated that it assisted households in a time of need. The intent was to prevent households from resorting to more extreme shocks. Without a counter-factual, there is no proof to say what would have happened if NE did not provide the cash transfers. In general, without a plan to sustainably provide a cash transfer, the cash transfer initiative is a one-off intervention that Nuru would assume not to repeat. That said, NE does need to elaborate another plan should such a severe drought reoccur.