# THE ULTRA-POOR GRADUATION PROGRAMME: ENDLINE REPORT

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# Contents

# List of Figures

# List of Tables

## Acronyms

- CHP - Community Health Promoters

- CFPR - Challenging the Frontiers of Poverty Reduction

- HFIAS - Household Food Insecurity Access Scale

- HH - Household

- IFAD - International Fund for Agricultural Development

- PSM - Propensity Score Matching

- PP - Percentage Points

- PPI - Progress out of Poverty Index

- PSM - Propensity Score Matching

- RCT - Randomized Control Trial

- SD - Standard Deviation

- UPG - Ultra Poor Graduation

- UGX - Ugandan Shillings

- Ush - Uganda Shilling

- VSLA - Village Savings & Loans Association

- WASH - Water, Sanitation & Hygiene

# Executive Summary

BRAC Uganda implemented the the Ultra Poor Graduation project for the first time in Uganda with the objective of improving the livelihoods and welfare of poor and vulnerable households. The underpinnings of the UPG model are that as a result of the multiple barriers relating to a lack of human and financial resources, poor people stand the risk of ending up in a vicious cycle of want, and are unable to gain enough leverage to help them exit this cycle. The model therefore relies on a staggered approach whereby poor households are provided with multiple interventions to help them smooth their immediate consumption expenditures while allowing them to build resilient livelihoods.

The project was implemented in Luweero and Masindi districts, among youth between the ages of 18 - 35 years old that were identified to be at the margins of poverty. In total, 1,650 individuals were targeted and received the different interventions. 1,216 of the youth that were involved with the project were also enrolled into a quasi-experimental research study and tracked for 2 years. The participating youth were compared with youth from the same geographical regions that were eligible to qualify for the project interventions, but were not enrolled into the project.

For youth that participated in the project, there was a significant improvement in agricultural and livestock productivity as well as animal stocks. Maize production was 100 kgs higher compared to the baseline, and participating households had a net production increase of 79 kilograms compared to comparison households. The net production was also significantly higher for households that grew beans and sweet potatoes increasing 14 kgs and 16 kgs respectively. There was a 13 pp and a 10 pp increase in households that reported selling maize and beans in the most recent season. The number of households that reported owning goats and pigs increased by 38% and 26% respectively while animal stocks among participating households were higher by about 2 animals. Participating households also reportedly sold more livestock compared to comparison households.

The project also resulted in impressive improvements in household food security. 53% of households were able to eat 3 or more meals a day, up from 21% at baseline while the impact was that the project moved 16% more intervention households into better food security categories. Savings increased by 56.7% between baseline and endline while amount saved increased by about 47,000 UGX. The intervention increased savings among project HHs by 33.8%. However, asset ownership, particularly for households assets increased for participating households implying increased spending power.

The intervention also influenced behavior through its WASH activities which saw the number of households that put into practice recommended water and sanitation measures increase. This was particularly true with respect to access to clean water. The fraction of households that treated their water increased from 32% at baseline to 56% at mid line while the number of households that maintained sanitary latrines rose 19% from baseline. The use of other practices like hand washing and access to toilet facilities were generally high.

All in all, there are indications that households that participated in the project are more resilient, and have experienced an increase in income and consumption. The project has had an impact on both human development as well as quality of life of participating households which is suggestive of short to medium term persistent effects on beneficiary households.

# Introduction

Uganda has made considerable strides in reducing the proportion of the population living below the $1.90/day (World Bank, 2016). Notwithstanding the progress, a number of core economic and social indicators such as the nutrition status, sanitation and the potential avenues for meaningful livelihoods, still lag behind. For instance, one third of the country's children are stunted while a similar proportion of the population do not have access to toilet facilities and nearly 70% do not have access to running water [2]. The highest rates of unemployment (64%) are reported among the youth (aged 18-35). This is especially problematic considering Uganda is the second youngest country in the world with the youth representing the largest share of the population [7]. In terms of infrastructure, while there has been considerable effort to improve road networks and connectivity, electricity remains sparse. Self-employment or entrepreneurship is often the lone workable substitute to tedious labor for the ultra-poor. Proponents of this approach support microcredit programs which promises to counter the low cash and skill bandwidth among the ultra-poor in starting a new business and consequently offshoot a viable shift to self-employment. The approach however has not noticeably upgraded the living standards of small business proprietors or their families. It is believed that the ultra-poor often cannot benefit from microfinance because of both demand and supply constraints [4]. As a result, the bulk of the ultra-poor rely on low-skilled wage employment (such as casual laborers in agriculture) as the primary source of income. The income from such sources of employment are often erratic and seasonal, resulting in transitional or long-term deprivation.

To address the multifaceted nature of ultra-poverty, BRAC launched the "Challenging the Frontiers of Poverty Reduction - Targeting the Ultra Poor (CFRP-TUP)[1]" in 2002 in Bangladesh with the explicit target of graduating the cohort out of ultra-poverty. The program integrated several proven poverty alleviation tools such as income generating asset transfer, health and social support and mentoring on business and life-skills in one package. Once selected through a set of rigorous targeting procedures, the participants are "enrolled" into the program and is expected to graduate out of ultra-poverty over a period of two years. The program was successful in lifting beneficiaries out of extreme poverty [3], improved income of ultra-poor women by 36% by prolonging self-employment [1], and had positive impacts as long as six years after the intervention ended [5,6]. The World Bank, exploiting the randomized roll-out of the program report significant gains in the nutrition status of all participants within treated households along with considerable spillover effects. The model has thus far been replicated across 20 countries. Using a randomized control trial across six countries, Banerjee et al. (2015) attribute an increase in food consumption (5.8%) even two years after graduation to program participation.

Given the demographic composition of Uganda and the untapped potential of the considerable youth population who remain disadvantaged, the Ultra-Poor Graduation Program was launched by BRAC in Uganda during early 2017 with a specific focus on this cohort. The UPG specifically targets 1650 ultra-poor youth aged between 18-35 in five locations in the Luwero and Masindi districts through integrated programming and sequenced set of interventions which includes livelihood training, consumption stipends, income generating asset transfer, savings and social integration. The objective of this report is to provide comprehensive pre- and post-intervention profiles of the targeted ultra-poor youths including targeting efficacy and investigate how they differ from the population belonging to the same cohort in their vicinity so as to establish a credible counterfactual for this evaluation. The rest of the report is structured as follows: The following section provides a background of the UPG followed by section 3, where demographic and education related aspects of the selected households are described. Section 4 provides a discussion and some concluding remarks.

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[1]Later renamed as "Ultra-poor Graduation Programme"

# Program Implementation & Theory of Change

The Ultra-Poor Graduation (UPG) program is an approach to poverty alleviation programming designed to improve the resilience of the ultra-poor and effectively address the worst forms of poverty. From its 2002 pilot, BRAC has scaled UPG to reach 1.8 million households in Bangladesh, and the 'Graduation Approach' has been adapted and scaled up in more than 40 countries. The program is a comprehensive time-bound, sequenced set of interventions targeted at creating sustainable economic and social progress in the lives of the ultra-poor: the most marginalized households living below the extreme poverty line. The approach includes livelihood and life-skills training, consumption stipends, asset transfers, savings and social integration. The intervention aims to produce six outputs that together support generation of sustainable livelihoods for the ultra poor and build resilience to future shocks. The first four outputs relate to BRAC's four graduation pillars, which are designed to reinforce one another to strengthen assets (human, physical, social, financial) and improve capacities (absorptive, adaptive, transformative), leading to socio-economic empowerment, and resilience (the outcome). To achieve output 5, BRAC strengthens civil society and government actors in order to generate an environment able to provide long term support for the ultra-poor. Lastly, output 6 is a robust, inclusive Monitoring, Evaluation & Learning (MEL) system to verify and share results both with BRAC and with other poverty reduction and social protection actors nationally and internationally.

BRAC follows the Participatory Rural Appraisals targeting methodology, combining rapport building, community meetings and four-tiered wealth ranking to create a poverty scorecard and collect information about household wealth and characteristics. The following criteria were applied in order to select beneficiaries:

* Extremely poor

* Youth aged 18-35

* Has no productive asset

* Mainly dependent on irregular earning

* Owns less than 1 acre of land

Once selected, beneficiaries received the following from the UPG support package:

* **Livelihood support**: selection of two assets from a menu (worth $250 total) and support from BRAC franchised entrepreneurs.

* **Skills training**: specific skill training on management of selected assets, basic business and financial skills training, and life skills training.

* **Consumption Support**: UGX 50,000 (approx.$16) per month to smooth over household consumption needs until the livelihoods support can generate a more consistence income (8 months), delivered biweekly by frontline field staff.

* **Hands-on coaching**: bi-monthly home visits to reinforce lessons learned in training and advise on behaviour changes, monthly group level coaching both as refresher training and to share lessons and success stories.

* **Health Services**: subsidized connection with the BRAC Community Health Promoters (CHP) programme and its franchised entrepreneurs, referrals to local clinics and hospitals for cases CHPSs cannot address.

* **Savings and Financial Access**: savings education included in the skills training modules, organizing youth into community-level savings groups.

∗ **Social Integration**: creation of Village Poverty Reduction Committees (VPRC) to promote youth livelihoods support and address beneficiary challenges. Membership includes local leadership, non-poor youth representatives, and beneficiary representatives.

# Methodology

## Study Population and Design

This was a quasi-experimental study owing to the fact we did not randomly assign beneficiaries to either the intervention or comparison group. To complete the assignment, we employed the use of propensity score matching (PSM) which involved matching individuals to other individuals that had similar characteristics and then assigned them to either one of two groups. The individuals were matched on basic demographic traits like age, gender and marital status as well as a number of socio-economic indicators such as income, household food security status and expenditure. The matching procedure resulted in an effective sample size of 1,216 intervention households and 865 comparison households. The households were selected from the districts of Luweero and Masindi which were the main project areas. In total, there where 5 branches (Bombo, Bweyale, Kigumba, Zirobwe and Wobulenzi) that were selected.

## Data Analysis

To evaluate the impact of the ultra-poor graduation program on key program indicators, we employ difference-in-difference methodology. The difference-in-difference-method compares the changes in outcomes over time between a population that is enrolled in a program (the treatment group) and a population that is not (the comparison group). In this method, the impact of the program is defined as the change in outcomes of the treatment group before and after the program, less the change in outcomes in the comparison group before and after the program.

First, by measuring the difference in the before-and-after outcomes for the enrolled groups—the first difference—we see how the treatment group changed between when they began and when they completed the program. This also allows us to controls for factors that are constant over time in that group (such as race, ethnicity etc.), since we are comparing the same group to itself. But we are still left with the factors that vary over time (time-varying factors), independent of the program. One way to capture those time-varying factors is to measure the before- and-after change in outcomes for a group that did not enroll in the program but was exposed to the same set of environmental conditions— the second difference. If we "clean" the first difference of other time-varying factors that affect the outcome of interest by subtracting the second difference, then we have eliminated a source of bias that is problematic in the simple before-and-after comparisons. The difference-in-differences approach does precisely that. It combines two estimates of the counterfactual (before-and-after comparisons, and comparisons between those enrolled and those who are not enrolled) to produce a better estimate of the counterfactual.

Instead of only comparing outcomes between the treatment and comparison groups after the intervention, the difference-in-differences method compares the change each group undergoes between the beginning and end of the program. By subtracting the before outcome situation from the after situation, we cancel out the effect of any characteristics that are unique to that individual that do not change over time. Interestingly, we are canceling out (or controlling for) not only the effect of observed time-invariant characteristics, but also the effect of unobserved time-invariant characteristics. This technique also allows groups to be compared that might be slightly different at the beginning of the program or at baseline, as long as we can assume the groups would experience the same change over time in absence of the program.

# Results & Discussion

This section highlights the main findings from the study focusing on the main UPG outcomes relating to crop & animal productivity, water & sanitation and household food security. A majority of the household indicators are representative of household level outcomes. Tables 1-6 summarize the descriptive statistics and compare the baseline and end line characteristics for only the households that received the interventions to show the changes that have happened in the intervention group over time. Tables 7-12 report the difference in difference statistics taking into consideration the changes that have happened between the intervention and comparison groups between baseline and mid line. They also highlight the impact of the UPG interventions and can be interpreted as evidence of the efficacy of the interventions.

**Table 1:** Basic Demographic characteristics and Program exposure(treated versus comparison households)

| . | Control | Treatment | P.Value |
|---|---|---|---|
| | n = 933 | n = 1147 | |
| **Basic demographic and household characteristics (treated versus comparison households)** | | | |
| Marital Status | | | 0.083 |
|   Married Monogamously | 433 (46.4%) | 523 (45.6%) | |
|   Never Married | 233 (25%) | 336 (29.3%) | |
| | | | |
| In school | | | 0.923 |
|   Yes | 52 (5.6%) | 73 (6.4%) | |
| | | | |
| Land acerage | | | 0.58 |
| | 4.6 (2.7) | 4.5 (2.7) | |
| | | | |
| House ownership | | | 0.023 |
|   Rent house | 148 (15.9%) | 146 (12.7%) | |
| | | | |
| Engaged in IGA | | | <.001 |
|   Yes | 547 (58.6%) | 787 (68.6%) | |
| **Program Exposure** | | | |
| | | | |
| In VSLA | | | <.001 |
|   Yes | 9 (1%) | 969 (84.5%) | |
| | | | |
| How often attends VSLA | | | 0.152 |
| | 3.0 (0.0) | 2.8 (0.5) | |

*Note:* Reporting difference between intervention and non interventions households.

We begin by giving a brief description of our population and comparing it against the households in the control group as a check for balance in individual and household characteristics. The average age of the youth in the cohort is about 26 years old while that of the control is about 25 years. About 46% of the youth in our intervention group are married while this is about 45% in the control. About 6 % of the youth in both groups are in school but a majority have already completed school. The average household land holding used for agriculture is about 4.5 acres across both groups while around 16% of households in the non-intervention and 12% of households in the intervention rent the house they live in. A majority therefore own their houses which is mostly typical in rural and peri-urban areas. At end line, considerably more intervention households (more than 10%), reported that any member aged over 15 years was engaged in one an income generating activity. The fraction of intervention households that reported being a member of a VSLA was about 83% higher in the intervention households with participants reporting attending VSLA meetings on average 3 times a week. From an evaluation perspective, in

**Table 2:** Basic Demographic characteristics and Program exposure

| . | Baseline | Endline | P.Value |
|---|---|---|---|
| | n = 1147 | n = 1147 | |
| **A) Basic demographic and household characteristics** | | | |
| Marital Status | | | |
| Married Monogamously | 387 (33.7%) | 523 (45.6%) | <.001 |
| Never Married | 464 (40.5%) | 336 (29.3%) | |
| | | | |
| In school | | | |
| %ge Yes | 120 (10.5%) | 73 (6.4%) | 0.27 |
| | | | |
| Land acerage | | | |
| | 0.8 (1.2) | 4.5 (2.7) | <.001 |
| | | | |
| House ownership | | | |
| Rent house | 145 (12.6%) | 146 (12.7%) | 0.745 |
| | | | |
| Engaged in IGA | | | |
| Yes | 689 (60.1%) | 787 (68.6%) | <.001 |
| **B) Program Exposure** | | | |
| | | | |
| In VSLA | | | |
| %ge Yes | 0 (0%) | 969 (84.5%) | <.001 |
| | | | |
| How often attends VSLA | | | |
| | 0.0 (0.0) | 2.8 (0.5) | <.001 |

*Note:* Reporting baseline and endline differences only for households that participated in the UPG program.

terms of the basic demographic and household characteristics, there is not much of a distinction between the comparison and intervention households.

## Water and Sanitation

The UPG project engaged in interventions to improve health outcomes within the communities. These interventions were mostly specific to improving personal and household hygiene by promoting best practices in maintaining hygienic conditions. To estimate the impact on WASH outcomes, we asked a set of questions relating to some basic practices that the household maintains. The individual questions are listed in Table 2, Panel B. The households were asked whether they washed their hands after toilet visits or before eating; whether they treated their water, had a piped water source or whether the water was stored safely; whether they had a clean latrine, whether all HH members used the latrine and whether the latrine was cleaned at least 2 times a week; and finally whether they had a dust bin pit. We aggregate these indicator and create a score based on these 9 practices to capture how many practices had been adopted. The average score in the intervention group increased from 3.7 at baseline to 5 practices by end line; while the number of households that adopted at least 5 WASH practices rose from 34% at baseline to 67% at end line.

In Table 8, we summarize the impacts on WASH outcomes. We see that there was a big impact on clean water access and treatment. We also see a 19 PP increase in households that adopted at least 5 WASH practices over and above what was observed among comparison households from baseline to end line. The overall WASH adoption score rose by 0.88 points on a 9 point scale (p<0.01) compared to the non-intervention households over the period of the intervention. Looking individually at the WASH component questions, the biggest contributors to the

**Table 3:** Water and sanitation indicators

| . | Baseline | Endline | P.Value |
|---|---|---|---|
| | n = 1147 | n = 1147 | |
| **A) WASH access and scores** | | | |
| Wash score | | | |
| | 3.7 (1.7) | 5.0 (1.9) | <.001 |
| Adopted 5 wash practices | | | |
| %ge Yes | 391 (34.1%) | 773 (67.4%) | <.001 |
| **B) Component WASH Questions** | | | |
| Wash hands after toilet | | | |
| %ge Yes | 822 (71.7%) | 953 (83.1%) | <.001 |
| Wash hands before food | | | |
| %ge Yes | 785 (68.4%) | 832 (72.5%) | <.001 |
| Piped Water source | | | |
| %ge Yes | 462 (40.3%) | 836 (72.9%) | <.001 |
| Water treated | | | |
| %ge Yes | 362 (31.6%) | 642 (56%) | <.001 |
| Water stored safely | | | |
| %ge Yes | 762 (66.4%) | 945 (82.4%) | <.001 |
| Has clean latrine | | | |
| %ge Yes | 900 (78.5%) | 971 (84.7%) | <.001 |
| HH members use latrine | | | |
| %ge Yes | 984 (85.8%) | 1,011 (88.1%) | <.001 |
| Latrine cleaned at least | | | |
| %ge Yes | 667 (58.2%) | 887 (77.3%) | <.001 |
| Has dustbin pit | | | |
| %ge Yes | 351 (30.6%) | 640 (55.8%) | <.001 |

*Note:* Reporting baseline and endline differences only for households that participated in the UPG program.

improvement in WASH practices were the number that reported getting their water from a piped water source which rose dramatically from 33% to 73%. The number that reported treating their water rose by about 25% and those that reportedly stored their water safely rose by about 16% to 82% at endline. A majority of HHs in the intervention areas reported having a clean latrine though the rise was marginal from 79% to 85% which overall reflects high general usage rates. We do however see a considerably higher number of households reporting that they cleaned their latrines at least 2 times a week; rising almost 20% to 77%. The number of households that had a dustbin pit rose to 56% of all the intervention households. Overall, the findings imply emphatic behavioral changes in the household's water access and treatment of water while there is consistent use of hygienic toilet facilities as well as in maintenance of personal hygiene and hand washing. The number that also adopted the use of dust bin pits rather than any other means of waste disposal was also impacted highly.

## Crop and animal production

One of the main activities for this particular project was to increase employment options and incomes. The ultra-poor being a vulnerable group and largely lacking the financial resources, skills or networks to rely on; makes it difficult for them to engage in any form of productive economic activity. To address this problem, the project provided the households with trainings in crop and animal management, as well as provided them with startup assets to help them begin in productive economic engagement. The households received livestock including chicken, pigs and goats as well as farming implements, seeds for maize & beans, and sweet potato cuttings.

**Table 4:** Crop Production

| . | Baseline | Endline | P.Value |
|---|---|---|---|
| **A) Maize production** | | | |
| Grew maize in last season | | | |
| %ge Yes | 595 (54.3%) | 690 (63.0%) | <0.001 |
| Maize production (in Kgs) | | | |
| | 121.1 (249.3) | 228.5 (370.8) | <0.001 |
| Sold maize | | | |
| %ge Yes | 234 (31.3%) | 410 (54.7%) | <0.001 |
| **B) Bean Production** | | | |
| Grew beans in last season | | | |
| %ge Yes | 363 (33.2%) | 397 (36.3%) | 0.13 |
| Bean production (in Kgs) | | | |
| | 18.1 (53.0) | 29.7 (70.9) | <0.001 |
| Sold beans | | | |
| %ge Yes | 69 (14.6%) | 119 (25.6%) | <0.001 |
| **C) Sweet Potato production** | | | |
| Grew sweet potatoes in last season | | | |
| %ge Yes | 170 (15.5%) | 224 (20.5%) | 0.003 |
| Sweet potato production (in Kgs) | | | |
| | 32.6 (112.9) | 49.4 (131.9) | 0.002 |
| Sold sweet potatoes | | | |
| %ge Yes | 45 (18.8%) | 60 (24.7%) | 0.11 |
| Plans to grow sweet potatoes in next season | | | |
| %ge Yes | 198 (82.5%) | 212 (87.2%) | 0.15 |

*Note:* Reporting baseline and endline differences only for households that participated in the UPG program.

In Tables 3 and 4, we report the outcomes for crop and animal production. The analysis includes all households involved in the study irrespective of whether they were or were not engaged in a particular enterprise. This is to generalize the impacts to the entire population rather than only among households that were engaged in specific enterprises. In Table 3, Panel A, we report the participation rates, production estimates and market access rates for households that grew maize, beans and sweet potatoes. There was a general increase between baseline and endline in the number of households that grew the three crops, as well as an improvement in production and sales. The number of households that reported growing maize rose almost 10pp to 63% while we see an increase in maize production from baseline to end line, from 121 kgs to 229 kgs (p<0.01). Reporting the impact estimate and comparing to the comparison group, over the period of the project, maize production increased by 79 kgs among intervention households (Table 9). This increase also appears to have been translated into a surplus that the households were able to sell. The number of households that reported selling maize produce on the open market increased from 31% of households in 2017 to 54% in 2019 (p<0.01). The overall project impact was an 13 pp increase in households selling maize produce as a result of the intervention. This is suggestive that at enterprise level, the intervention potentially increased the household's ability to produce more maize with the input boosts. This could mean that households are usually capital constrained and are unable to afford the costs of production at the beginning of the season and the inputs were very useful in overcoming this constraint. It should be noted that

maize is the main staple crop in many households and is present in almost all households farming regimes.

Beans are another common food crop which is grown in the study areas and UPG households received bean seeds at the beginning of the season at no cost. At endline, about 36% of beneficiaries grew beans during the previous season, up from 33% at baseline. Household production also increased from 53 kgs in 2017 to 71 kgs in 2019 (p<0.01). This is an equivalent of about ¾ of a sack. Consequently, there was an 11% increase in the number of households that reported selling their beans. At end line, about 26% of households said they had sold some beans. In terms of an impact estimate, bean production increased by 13 kgs among beneficiaries when compared with non-intervention households reflecting an impact of the project interventions on bean productivity. There was also an impact in the number of households that were able to sell beans increasing significantly. 10% more households in the intervention group were able to sell their beans compared to non-participating households.

The project similarly provided free sweet potato vines to the households. At endline, around 21% of households were engaged in sweet potato farming compared to 16% at baseline. There was a marginal increase in productivity, rising around 16 kgs from baseline, and production among beneficiaries rose 16 kgs compared to non intervention households (p<0.05), reflecting a significant impact. The fraction of households that reported selling their produce was about 6% higher from endline. There was a net increase of 5pp in the number of households that reported growing sweet potatoes; and 9pp in the number that sold sweet potatoes. In terms of take up therefore, the project seems to have had a moderate impact on encouraging households to grow sweet potatoes though this didn't seem to translate into production windfalls during the season.

The project also registered increases in animal productivity among beneficiaries over its lifetime. The households were provided with breeding stock for chicken, goats and pigs to enable them begin animal enterprises which could provide them with a sustainable source of income. We see increases in the number of households that raised livestock as well as animal stocks and sales numbers (Table 4). The number of households that had any chicken at endline was 68% while chicken stocks increased from 3 to 7 from baseline to endline (p<0.1). The subsequent impact was an increase of about 3 chicken in intervention households. During FGD's, households reported that many of them had suffered large losses to their stock mostly as a result of poor management. Chicken are particularly susceptible as they are sensitive to adverse conditions and disease, and therefore require utmost care and attendance. However, despite the reported losses even among the UPG households, it appears the intervention households were more resilient and fared better than non intervention households. Treated households also increased the number of chicken sold significantly from 13% at baseline to 32% at endline and this was corroborated in a 0.74% change in net sales over non intervention households.

For goats and pigs however, indications are that the project increased both stock and sales significantly. The number of households that owned goats increased 38 pp while the number that owned pigs rose by 26 pp between baseline and endline. Comparing to households that did not receive the intervention, UPG households increased their goat and pig stocks by around 1 - 2 animals on average, and were able to sell at least on animal more in a one year period. The number of households that sold goats rose from 6.3% at baseline to 35% at endline while the number that sold pigs rose 5% to 24%.

## Household food security

Ensuring household food security is critical especially in vulnerable households that are rarely able to meet their nutritional requirements. At baseline, the number of households suffering from severe food insecurity stood at

**Table 5:** Animal ownership and sales

| . | Baseline | Endline | P.Value |
|---|---|---|---|
| **A) Chicken production** | | | |
| Owns chicken (%ge Yes) | 431 (39.4%) | 741 (67.7%) | <0.001 |
| Number of chicken owned | 3.1 (6.9) | 7.1 (9.3) | <0.001 |
| Sold chicken (%ge Yes) | 138 (12.6%) | 353 (32.2%) | <0.001 |
| Number of chicken sold | 0.5 (2.2) | 1.7 (4.2) | <0.001 |
| **B) Goat production** | | | |
| Owns goats (%ge Yes) | 371 (33.9%) | 789 (72.1%) | <0.001 |
| Number of goat owned | 1.1 (2.0) | 3.5 (4.5) | <0.001 |
| Sold goats (%ge Yes) | 69 (6.3%) | 387 (35.3%) | <0.001 |
| Number of goats sold | 0.1 (1.0) | 0.9 (3.3) | <0.001 |
| **C) Pig production** | | | |
| Owns pigs (%ge Yes) | 256 (23.4%) | 537 (49.0%) | <0.001 |
| Number of pigs owned | 0.6 (1.5) | 1.9 (3.2) | <0.001 |
| Sold pigs (%ge yes) | 58 (5.3%) | 263 (24.0%) | <0.001 |
| Number of pigs sold | 0.1 (0.6) | 0.9 (3.8) | <0.001 |

*Note:* Reporting baseline and endline differences only for households that participated in the UPG program.

61% of all the intervention households. For this reason, a number of households therefore either ate less than recommended number of meals per day, or ate meals that they deemed insufficient which could potentially increase the risk of malnutrition. The project objectives were to improve this status quo by improving the household's access to quality food, in sufficient quantities.

Household food security was measured using the household food insecurity access scale (HFIAS) which is a standardized measure that captures different dimensions of food insecurity in the domains of quality, quantity and access[2]. The scale ranges from a score of 1- 27 with a lower score reflecting better food security. The HFIAS uses a set of questions to capture how often a household experiences anxiety or instances in which they are forced to eat lower quality or smaller quantities of food. The scale measures the households food consumption over a month and therefore captures both trends or seasonality. For this reason, it is very rigorous in that even small fluctuations in monthly food consumption can affect the household classification. The findings are presented in Table 5. In Panel A, we see that there was an increase in the number of meals had per day from 2 at baseline to about 3 at end line (p<0.01). The fraction of households that had at least 2 or more meals also increased from 83% to 94%, while

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[2]The HFIAS was developed by the food & nutrition technical assistance project (FANTA). Methodology and estimation will differ from UPG monitoring approaches.

**Table 6:** Household food security and access

| . | Baseline | Endline | P.Value |
|---|---|---|---|
| | n = 1147 | n = 1147 | |
| **A) Food access indicators** | | | |
| No of meals/day | 2.0 (0.6) | 2.5 (0.6) | <.001 |
| > 2 meals/day | | | |
| Yes | 954 (83.2%) | 1,083 (94.4%) | <.001 |
| > 3 meals/day | | | |
| Yes | 241 (21%) | 604 (52.7%) | <.001 |
| **B) Food quality/ quantity indicators** | | | |
| HFIAS score | 11.9 (5.6) | 9.1 (5.3) | <.001 |
| Food quality | | | |
| High Qualtiy | 148 (12.9%) | 182 (15.9%) | 0.05 |
| Food Quantity | | | |
| Sufficient Quantity | 244 (21.3%) | 527 (45.9%) | <.001 |
| **C) Food security categories** | | | |
| Food security (Excellent) | | | |
| %ge Yes | 4 (0.3%) | 1 (0.1%) | 0.396 |
| Food security (Good) | | | |
| %ge Yes | 47 (4.1%) | 169 (14.7%) | <.001 |
| Food security (Moderate) | | | |
| %ge Yes | 271 (23.6%) | 439 (38.3%) | <.001 |
| Food security (Bad) | | | |
| %ge Yes | 699 (60.9%) | 370 (32.3%) | <.001 |

*Note:* Reporting baseline and endline differences only for households that participated in the UPG program.

the fraction that had at least 3 meals rose 30% to 53%. The actual impact on number of meals was a 3% increase in the number of households that ate 2 meals or more per day; though there is a significantly larger increase in the number of households that ate at least 3 meals per day. This increased by 13 pp among intervention households. In Panel B, we report the average HFIAS score and see that it improves 2 points from 11 to 9 (p<0.01). We also ask about the households perceptions towards the quality and quantity of food that they consumed. There was a 3% increase between baseline and end line in the number of households that reported that they had consumed food of sufficient quality in the previous one month. About 46% of the households reported that they did not lack any food in the last month up from 21% at baseline. The project therefore improved sufficient access to food by about 13% compared to the non-intervention households.

We classify the households into 4 categories according to how often they experience specific food accessibility issues. The categories range from excellent food security, good food security, moderate food security and bad food security. The excellent households comprise of those that rarely or do not report having any food deficits in terms of quality and quantity consumed. The good households experience mild forms of food security relating to anxiety about access and consuming foods of lower quality than they would wish. The moderate group constitutes those households that occasionally consume meals of lower quality or skip a few meals while the bad food security group is made up of households that often skip several meals. At endline, the fraction of households ini the bad food security group fell from 61% to 32% while those that had moderate and good food security rose 15% and 10%

respectively. In essence, households transition between the categories, moving from one food security category to another. Subsequently, we can conclude that a majority of households that were initially severely food insecure progressed to better forms of food security. In impact terms, the project improved the welfare of 16% more severely food insecure households (Table 12). 7% more intervention households graduated into the good food insecurity group which is the last category before attaining excellent food security. [**?**]

**Table 7:** Log frame indicators

| . | Baseline | Endline | P.Value |
|---|---|---|---|
| **Logframe indicators** | | | |
| Eats 2 or more meals | | | |
| (%ge Yes) | 954 (83.2%) | 1,083 (94.4%) | <.001 |
| Has savings | | | |
| (%ge Yes) | 371 (32.3%) | 973 (84.8%) | <.001 |
| Amount saved | | | |
| (In Ush) | 97,378 (148,263) | 144,417 (188,803) | <.01 |
| No. of IGAs | | | |
| | 1.2 (0.9) | 1.9 (1.0) | <0.001 |
| More than 2 IGAs | | | |
| (%ge Yes) | 397 (36.3%) | 691 (63.1%) | <0.001 |
| More than 3 IGAs | | | |
| (%ge Yes) | 96 (8.8%) | 263 (24.0%) | <0.001 |

*Note:* Reporting baseline and endline differences only for households that participated in the UPG program.

## Logframe indicators

Tables 6 and 7 summarize the descriptive and impact estimates for selected log frame indicators relating to employment, incomes and savings. The project through its interventions intended to increase employment options for youth by giving them necessary skills to be able to engage in at least two or more income generating activities. The number of IGA's were calculated based on the number of unique enterprises or occupations. For instance, owning pigs and goats are considered to provide different income streams and hence treated as separate IGA's[3]. This mostly applied to agriculture related enterprises which are performed by a majority of rural households. Essentially therefore, diversifying the number of enterprises would result in increasing the number of IGA's. On average, participating youth were engaged in 2 IGA's and there is a general increase in the number of households that have at least 2 IGA's, from 36% at baseline to 63% at endline. When we consider the number that had 3 or more IGA's, there is an increase from 9% to 24% from baseline to endline. The projects impact was a 17 pp increase in the number of youth with more than 2 IGA's. We also see the number of households that had savings rise from 32% to 85%. The project had an impact of increasing savings by 33 pp.

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[3]Information regarding income generating activities was only collected with reference to the previous month hence may exclude seasonal activities.

# Conclusion & Recommendation

The UPG project comprised of a set of interventions aimed at improving the socio-economic welfare of poor households through an integrated approach. The project interventions took place over a two year period and included a number of direct intensive interventions like cash and asset transfers, as well as soft behavioral change interventions like sensitization, hands on coaching and skills training. The idea was that by providing the households with the skills and asset support, it would enable them to ensure sustainable livelihoods for themselves over time. Suggestions from the impact study are that the graduation approach has indeed helped to improve productivity, incomes and livelihoods. Indications are that it has also contributed to shaping behavior particularly with respect to water and sanitation practices. Crop production and animal stocks were observed to have increased over the period of the intervention over and above non-participating households. Households received seed stocks at the beginning of the season for maize and bean seeds as well as sweet potato vines which saw increased yields at the end of the season. Given that a majority of the households are subsistence households, it is likely that the household's decision to increase production is limited by their ability to access inputs. Most households own about 4 acres of land though the amount of land that was apportioned for agricultural production was much less. The increased production did increase the end of season yield by about a sack which is equivalent to about 50,000 Ush. The highest productivity increase was seen for maize while considerably more households reported a plan to grow sweet potatoes. The implication on the household's long term productivity are uncertain as subsistence households tend to end up in a rut at the beginning of the season. In the short term however, it has helped to solve the immediate problem associated with production constraints. The increased income flow from produce sales can definitely contribute to consumption smoothing at household level which is fundamentally the objective of the graduation approach. Animal stocks and production has also grown as a result of the transfer. As opposed to crop production, livestock production is less seasonal and ideally has more potential for gradual multiplication through breeding. It can however be similarly subject to sudden losses through shocks as a result of poor management. Nevertheless, even marginal increases in stock can contribute considerably to welfare as livestock are a very practical asset option that can easily be converted into cash. We are limited in our understanding of the exact production and sales cycles that households employ as this could help explain some variation in stock numbers with households that are more vulnerable unable to increase their stocks. The production windfalls to a large extent contributed to the overall households food security either by increasing the amount of food available for consumption, or from being able to afford a larger variety of quality foods. This translation into food security indicates that small improvements in the households ability to produce can have large impacts in other aspects of the households welfare including asset ownership. Behavioral change in terms of practice of recommended sanitation practices also improved especially for particular. Most households that already practice seem to exhibit habitual behavior and indicates that these habits persist over time. New behaviors adopted are therefore likely to have the same persistent effects over time. All in all, whether the interventions will have long term impacts would be curious though it is suggestive that the short and medium term impacts are considerable.

From an evaluation standpoint, designing the evaluation to capture, more frequently, the transitions that households make could enable us understand how they components of the intervention work more clearly. For instance, being able to understand how animal stocks change over a year could allow us to make inferences about the longevity of the model. It would also be of interest to track the households over a prolonged period of time exceeding that of the project interventions to see to what extent the households managed to stay above the poverty line, or rather overcome the poverty trap.

# Appendix

**Table 8:** Impact on selected Logframe indicators

|  | *Dependent variable:* | | |
|---|---|---|---|
|  | > 2 meals | > 2 IGAs | Has Savings |
|  | (1) | (2) | (3) |
| Treated | − 1.71 (1.37) | 5.30$^{**}$(2.23) | 1.19 (1.94) |
| Round | 8.25$^{***}$(1.44) | 10.03$^{***}$(2.40) | 22.63$^{***}$(2.07) |
| **Treatment*Round** | **2.99 (1.93)** | **16.82$^{***}$(3.16)** | **33.02$^{***}$ (2.78)** |
| Constant | 84.89$^{***}$(1.02) | 30.95$^{***}$(1.70) | 131.22$^{***}$(1.44) |
| Observations | 4,160 | 3,786 | 4,050 |
| $R^2$ | 0.03 | 0.07 | 0.23 |
| Adjusted $R^2$ | 0.02 | 0.06 | 0.22 |
| Residual Std. Error | 0.31 (df = 4156) | 0.48 (df = 3782) | 0.44 (df = 4046) |
| F Statistic | 36.12$^{***}$ (df = 3; 4156) | 88.01$^{***}$ (df = 3; 3782) | 392.81$^{***}$ (df = 3; 4046) |

*Note:* Coeffecients with standard error's in brackets. P values *0.1,**0.05,***0.01. Bold font reflects DID estimate

**Table 9:** Impact on WASH outcomes

| | Clean water source | > 5 WASH practices | WASH score |
|---|---|---|---|
| | *Dependent variable:* | | |
| | (1) | (2) | (3) |
| Treated | −0.03***(0.01) | −0.03 (0.02) | −0.07 (0.08) |
| Round | 0.02*(0.01) | 0.14***(0.02) | 0.45***(0.08) |
| **Treatment*Round** | **0.01 (0.01)** | **0.19*** (0.03)** | **0.88*** (0.11)** |
| Constant | 0.97***(0.01) | 0.37***(0.02) | 3.74***(0.06) |
| Observations | 4,037 | 4,160 | 4,160 |
| $R^2$ | 0.01 | 0.08 | 0.08 |
| Adjusted $R^2$ | 0.01 | 0.07 | 0.08 |

*Note:*  Coeffecients with standard error's in brackets. P values *0.1,**0.05,***0.01. Bold font reflects DID estimate

**Table 10:** Impact on crop production yields (Yield in Kilograms)

| | Maize production | Bean production | Sweet potato production |
|---|---|---|---|
| | *Dependent variable:* | | |
| | (1) | (2) | (3) |
| Treated | −74.98***(15.35) | −1.72 (2.88) | 20.15***(4.73) |
| Round | 28.43*(16.54) | − 1.87 (3.09) | 0.92 (5.08) |
| **Treatment*Round** | **78.94*** (21.72)** | **13.50*** (4.07)** | **15.80** (6.69)** |
| Constant | 196.10***(11.70) | 19.79***(2.19) | 12.48***(3.60) |
| Observations | 3,767 | 3,785 | 3,773 |
| $R^2$ | 0.02 | 0.01 | 0.02 |
| Adjusted $R^2$ | 0.02 | 0.01 | 0.02 |

*Note:*  Coeffecients with standard error's in brackets. P values *0.1,**0.05,***0.01. Bold font reflects DID estimate

**Table 11:** Impact on crop production and sales

|  | Dependent variable: | | | | | |
|---|---|---|---|---|---|---|
|  | Grew maize | Sold maize | Grew beans | Sold beans | Grew Sweet | Sold sweet |
|  | (1) | (2) | (3) | (4) | (5) | (6) |
| Treated | $-7.19^{***}$ (2.27) | $-12.93^{***}$ (2.76) | $7.84^{***}$ (2.12) | $-5.67^{*}$ (3.21) | $8.38^{***}$ (1.56) | 1.56 (5.67) |
| Round | 2.51 (2.44) | $10.34^{***}$ (2.97) | $-2.63$ (2.28) | 1.05 (3.72) | $-0.38$ (1.68) | $-3.13$ (7.12) |
| **Treatment*Round** | **6.17$^{*}$ (3.21)** | **13.08$^{***}$ (3.90)** | **5.74$^{*}$ (3.00)** | **9.96$^{**}$(4.55)** | **5.31$^{**}$(2.21)** | **9.07 (8.01)** |
| Constant | $61.53^{***}$ (1.73) | $44.26^{***}$ (2.10) | $25.31^{***}$ (1.61) | $20.26^{***}$ (2.63) | $7.14^{***}$ (1.19) | $17.19^{***}$ (5.04) |
| Observations | 3,786 | 2,580 | 3,786 | 1,400 | 3,786 | 611 |
| $R^2$ | 0.01 | 0.04 | 0.01 | 0.01 | 0.03 | 0.01 |
| Adjusted $R^2$ | 0.01 | 0.04 | 0.01 | 0.01 | 0.03 | 0.004 |

*Note:*            Reporting percentage point increase. P values *0.1,**0.05,***0.01

**Table 12:** Impact on Animal production, quantity for Livestock owned and sold

|  | Dependent variable: | | | | | |
|---|---|---|---|---|---|---|
|  | No of chicken | chicken sold | No of Goats | Goats sold | No of Pigs | Pigs sold |
|  | (1) | (2) | (3) | (4) | (5) | (6) |
| Treated | $0.72^{**}$ (0.34) | 0.12 (0.13) | $0.25^{*}$ (0.14) | 0.02 (0.09) | 0.16 (0.10) | 0.02 (0.10) |
| Round | $0.94^{***}$ (0.36) | $0.46^{***}$ (0.14) | 0.06 (0.15) | 0.04 (0.09) | 0.15 (0.10) | 0.13 (0.11) |
| **Treatment*Round** | **2.99$^{***}$ (0.48)** | **0.74$^{***}$ (0.19)** | **2.37$^{***}$ (0.19)** | **0.71$^{***}$ (0.12)** | **1.16$^{***}$ (0.14)** | **0.64$^{***}$ (0.14)** |
| Constant | $2.42^{***}$ (0.26) | $0.39^{***}$ (0.10) | $0.85^{***}$ (0.10) | $0.11^{*}$ (0.07) | $0.44^{***}$ (0.07) | 0.11 (0.08) |
| Observations | 3,781 | 3,775 | 3,786 | 3,786 | 3,786 | 3,786 |
| $R^2$ | 0.06 | 0.03 | 0.14 | 0.03 | 0.08 | 0.02 |
| Adjusted $R^2$ | 0.06 | 0.03 | 0.14 | 0.03 | 0.08 | 0.02 |

*Note:*            Coeffecients with standard error's in brackets. P values *0.1,**0.05,***0.01. Bold font reflects DID estimate

**Table 13:** Impact on household food security and access

| | > 2 meals | > 3 meals | Good quality | Good quantity | FS(Excellent) | FS (Good) | FS (Moderate) | FS (Bad) |
|---|---|---|---|---|---|---|---|---|
| | *Dependent variable:* | | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Treated | − 1.71 (1.37) | − 0.53 (2.00) | 0.92 (1.54) | 0.81 (1.99) | 0.27 (0.22) | − 1.05 (1.37) | − 4.95$^{**}$(2.23) | 5.73$^{**}$ (2.22) |
| Round | 8.25$^{***}$(1.44) | 18.97$^{***}$(2.10) | − 0.54 (1.62) | − 11.68$^{***}$(2.09) | 0.12 (0.23) | 5.59$^{***}$(1.45) | 9.43$^{***}$(2.35) | − 15.14$^{***}$(2.40) |
| **Treatment*Round** | **2.99 (1.93)** | **12.68$^{***}$(2.83)** | **−2.43 (2.18)** | **−12.99$^{***}$(2.81)** | **−0.41 (0.31)** | **7.07$^{***}$(1.95)** | **8.87$^{***}$(3.17)** | **−15.53$^{***}$ (3.23)** |
| Constant | 84.89$^{***}$(1.02) | 21.54$^{***}$(1.49) | 186.17$^{***}$(1.14) | 177.92$^{***}$(1.48) | 0.12 (0.16) | 5.66$^{***}$(1.02) | 31.49$^{***}$(1.66) | 62.73$^{***}$(1.69) |
| Observations | 4,160 | 4,160 | 4,160 | 4,160 | 3,622 | 3,622 | 3,622 | 3,622 |
| R$^2$ | 0.03 | 0.08 | 0.001 | 0.05 | 0.001 | 0.03 | 0.02 | 0.06 |
| Adjusted R$^2$ | 0.02 | 0.08 | 0.0003 | 0.05 | −0.0002 | 0.03 | 0.02 | 0.06 |

*Note:*Coeffecients with standard error's in brackets. P values *0.1,**0.05,***0.01. Bold font reflects DID estimate

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