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Photos by Robin Wyatt

48-Month Survey: Concern Worldwide's Graduation Programme in Rwanda

Consolidated Analysis

Ricardo Sabates - Stephen Devereux - Rachel Sabates-Wheeler

Concern worldwide

IDS Institute of Development Studies

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This report builds from findings from consolidated reports, baseline and 12 months after the initial cash transfer and baseline to 36 months after the initial cash transfer. We would like to thank the respondents in the beneficiary and control groups who agreed to participate in the survey. Without their willing participation the research would not have been possible. We would also like to acknowledge the enumerators, who are either current or recently graduated students of the National University of Rwanda in Rwanda.

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Executive Summary

This report presents the findings from four quantitative surveys. The first conducted at baseline '**baseline survey'** the second 12 months after the first cash transfer **'12 months survey'**, the third '**36 months survey'** after the first cash transfer and the fourth at **48 months survey** after the first cash transfer disbursement.

The first time period is important as this was carried out during the cash transfer period, when beneficiaries had received a full year of cash transfer (12 months), thus it is expected to capture changes in outcomes which were the result of income changes. The 36 month period is important as it captures the potential effect of skills and coaching and thus the sustainability of the income effect over time. The 48 month period captures the sustainability of the project over time, when all support has been discontinued and it is expected that beneficiary households maintain a sustained improvement over time. The trend analysis indicate whether relative changes that were measured right after the end of the cash transfer remain sustained 30 months after the final cash transfer was disbursed.

This report therefore, evaluates if the observed changes recorded in the consolidated reports for the 12 and 36 months surveys have been sustainable over time. In this report we also identify graduation pathways; that is factors that enable certain households to maintain a sustained improvement.

Related to the trend analysis, the results highlight the trend relative to the result obtained in the 12 month survey – in other words, whether or not the gains made during the intensive cash transfer phase where sustainable.. Five possible results can be expected: A **sustained** improvement is obtained when we estimate a relative difference in the outcome in favour of beneficiaries between baseline and the 48 month survey and this estimated difference is similar, or even larger, than the one estimated between baseline and the 12 month survey. A **sustained but declining** result is obtained when there is a relative difference between beneficiaries and control group during the 48 month survey, but this difference is smaller than the one estimated during the 12 month survey. In other words, the initial improvement found in the 12 month survey is still found, but its value has declined or has reduced. At the extreme situation, we classified differently outcomes for which there was an initial difference during the 12 month survey, but this has completely **disappeared** during the 48 month survey. A **late improvement** is found for some outcomes for which finding a benefit takes time, whereas **no change** is used for outcomes for which there was no relative difference over time between treatment and control group.

Our first key finding from the Graduation Programme is that improvement recorded in the 12 month survey for most of the impact indicators has been sustained over time, although for some indicators there are signs of convergence.

In particular, we find that beneficiaries have maintained lower levels of deprivation, compared to control groups. While it has been sustained over time, it has seen a decline from the high point achieved in during the cash transfer period (12 months survey), thus the assessment is that of '**sustained but declining'** in terms of the difference found after 48 months, compared to the period of the cash transfer. The lack of deprivation of control group households has improved over time and thus the relative improvement in lack of deprivation recorded for beneficiaries after 12 months into the programme has declined after 48 months into the programme (although the well-being of beneficiaries remains relatively higher than the control group 48 months after the programme, the gap is closing).

Beneficiaries have maintained higher levels of productive assets, livestock ownership, and consumption assets over time relative to control group households. For productive assets, the results clearly demonstrate a **sustained** improvement for beneficiaries compared to control, who saw a slight decline in productive assets from baseline. For consumption assets, again, beneficiaries have managed to **sustain** upwards their consumption assets, over the four year period, while the control has seen no change since the baseline.

With respect to savings, we found a massive improvement in the propensity to save for beneficiaries relative to control group during the time they were in receipt of cash transfer. This progress was **sustained but declining** after 48 months, as those saving fell back from the level achieved during the cash transfer phase. On the positive side, beneficiaries have been more able to take loans and importantly they were also more likely to have the loan repaid relative to control group households during the 48 months survey.

For primary school enrolment, there is **no relative difference** between beneficiaries and control. The number of children from beneficiary households going to primary school has increased from 63% to 84%. This progress is matched by control households. For affordability of school uniform, the results are **sustained**. The proportion of beneficiaries who could afford uniforms for most or all children increased from 7% during baseline at 83%. Although we are not able to conclude on the proportion of secondary school age children attending secondary school, it seems that financial barriers to education are reduced by the support received..

The trend for the proportion of households eating meat and drinking milk are **sustained but declining** in terms of the difference after 4 years (48 months) of programming compared to the gains made at the more intensive phase in the first 12 months. The gains made amongst beneficiary households was **sustained** upwards for growing vegetables and **sustained** for those growing fruit.

In the absence of anthropometric[1] measurements of individual nutrition status, a subjective indicator was applied: respondents were asked for their perception of the prevalence of malnutrition in their households. When comparing the relative change over time between beneficiaries and control group households we find that this is not significant, since both groups reported a reduction in subjective malnutrition within their respective households.

In terms of hygiene and preventive measures, households reported on whether their members sleep under mosquito nets, the frequency of using soap, and the frequency of changing clothes. Results show that beneficiaries continue to have a **sustained** benefit in terms of the use of mosquito nets and sustained but declining in terms of the frequency of using soap, and the frequency of changing clothes, relative to the control group.

For engagement in social activities, two indicators, participating in women's meetings and membership of cooperatives are '**Sustained'**, whereas for church attendance and participation in *Umuganda* the trend is '**Sustained but declining**'. For all 4 indicators there has been a decline in participation between the 36 and the 48 months surveys for both control group and beneficiaries. Still, beneficiaries maintain a relatively higher participation in all social activities compared with control group.

Trends in the 'Key impact indicators' are shown in the table below.

[1] Refers to measurement of human being: weight/height etc.

Key impact indicators for the Graduation Programme in Rwanda

#	Hypothesis	Baseline		+12 months		+36 months		+48 months	
		Control	Treatment	Control	Treatment	Control	Treatment	Control	Treatment
1	Households that participate in the Graduation Programme will register lower levels of deprivation than at baseline, in comparison to control group households. (*The deprivation index is inverse, so a higher value represents lower levels of deprivation*)	2.26	1.94	2.51	6.96	3.75	5.89	2.71	4.64
2	More households that participate in the Graduation Programme will register higher levels of productive assets than at baseline, in comparison to control group households. (*Value represents an index of productive assets*)	3.10	2.43	3.27	4.59	2.82	4.48	2.58	4.54
3	More households that participate in the Graduation Programme will register higher levels of consumption assets than at baseline, in comparison to control group households. (*Value represents an index of consumption assets*)	4.45	3.44	3.71	6.87	4.77	7.98	3.87	7.09
4	More households that participate in the Graduation Programme will have savings than at baseline, in comparison to control group households. (*Value represents proportion of households who saved*)	9%	12%	16%	96%	31%	76%	37%	84%
5	More households that participate in the Graduation Programme will send some or all	64%	63%	75%	80%	81%	84%	83%	84%

	of their primary school-age children to primary school than at baseline, in comparison to control group households. (*Value represents proportion of children*)								
6	More households that participate in the Graduation Programme will send some or all of their secondary school-age children to secondary school than at baseline, in comparison to control group households. (*Value represents proportion of children*)	11%	10%	15%	23%	n.a.	n.a.	n.a.	n.a.
7	More households that participate in the Graduation Programme will be eating meat than at baseline, in comparison to control group households. (*Value represents proportion of households who eat meat at least once a month*)	18%	8%	5%	41%	24%	39%	3%	21%
8	Fewer households that participate in the Graduation Programme will perceive that members of the household are malnourished than at baseline, in comparison to control group households. (*Value represents proportion of households*)	42%	25%	31%	12%	8%	2%	7%	1.5%
9	More households that participate in the Graduation Programme will be using mosquito nets than at baseline, in comparison to control group households. (*Value represents proportion of households who have at least some members sleeping under mosquito nets*)	60%	76%	57%	64%	67%	89%	50%	68%

10	Households that participate in the Graduation Programme will be changing their clothes at least every 2 to 3 days than at baseline, in comparison to control group households.(*Value represents proportion of households*)	24%	11%	19%	64%	26%	60%	30%	55%
11	More households that participate in the Graduation Programme will be attending women's meetings than at baseline, in comparison to control group households. (*Value represents proportion of households*)	69%	62%	64%	80%	67%	79%	58%	72%
12	More households that participate in the Graduation Programme will be members of cooperatives than at baseline, in comparison to control group households. (*Value represents proportion of households*)	26%	18%	18%	75%	32%	75%	28%	65%

Taking the analysis one step forward, given that we have four periods of time and specifically two periods of time post the end of the cash transfer, we were able to provide a classification of households that takes into account a poverty score card, and trajectories of sustainable change over time. Using these two concepts, we classified all households according to four different groups:

(i) Sustained change over time: There is still a relative improvement in the difference between treatment and control 48 months after the start of the programme AND this relative improvement is similar (or larger) to that estimated during the 12 month survey.
(ii) Late improvement: There is a relative improvement in the difference between treatment and control 48 months after the start of the programme AND this relative improvement IS NOT found during the 12 month survey.
(iii) Decline over time: There is still a relative improvement in the difference between treatment and control 48 months after the start of the programme BUT the relative improvement is smaller than that estimated during the 12 month survey.
(iv) No change over time: There IS NOT relative difference on the outcome over time.

Depending on the outcome, we found that beneficiaries have significantly maintained a sustained improvement over time. For instance, 40% of beneficiaries had a sustained improvement in reduced deprivation (only 4% of control group did). 49% of beneficiaries had a sustained improvement in productive assets and only 19% of control group did. Three-quarters of all beneficiaries had sustained improvements in consumption assets, and only 10% of control group households did.

Finally, we find labour capacity, receiving additional support from outside of the home, and cooperative membership as key determinants of whether households are classified as showing a sustained change.

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1. Concern Worldwide's 'Graduation Programme' in Rwanda

Concern Worldwide launched a programme called 'Enhancing the Productive Capacity of Extremely Poor People' – known as the 'Graduation Programme' in this report – in two districts of southern Rwanda in May 2011. The Graduation Programme is designed to support extremely poor households[2] through cash transfers to meet their basic needs, skills development to enable them to improve their livelihood options, and savings to increase resilience to shocks, thereby enabling sustainable exits from poverty.

The programme also aims to contribute to the efforts being made by the Government of Rwanda in implementing the National Social Protection Strategy. Specifically, it is closely aligned with the government's 'Vision 2020 Umurenge Programme' (VUP), because a primary objective of both interventions is to enable extremely poor households to exit poverty sustainably. Concern's Graduation Programme aims to unleash the productive capacity of those poor households who have capacity to work and increase their resilience to shocks,[3] by providing support not only to meet their basic needs but also to develop livelihood strategies, social networks and confidence that will generate sufficient income to escape from poverty and remain out of poverty. The programme also aims to build confidence and enable the participants to plan for their future.

Governments, including the Government of Rwanda, are increasingly interested in assisting poor households to 'graduate' out of poverty or extreme poverty, Graduation must be distinguished from 'exit', which describes a process whereby individuals or households move from a position of dependence on external assistance to a state where they no longer need such support and can leave the programme. Graduation is popular with governments and development partners because it signifies success in terms of poverty reduction policy goals. 'Exit' is also popular, because it reduces programme costs and can make very expensive programmes fiscally affordable. The approach to graduation championed in Bangladesh – by BRAC's 'Challenging the Frontiers of Poverty Reduction' (CFPR) and the 'Chars Livelihood Programme' – combines cash transfers to the poorest households with productive asset transfers, microfinance (promotion of savings and access to credit), training in income-generating activities, and strengthened community support mechanisms. Evaluations have confirmed that this approach can achieve positive impacts, including graduation. BRAC's programme has positively influenced occupational choices with a 92% increase in the number of hours devoted to self-employment after four years and a

[2] Concern defines the extremely poor as those who lack the means for basic survival and are unable to meet their own or their household's basic needs for food, health care, shelter, and education.

[3] Rwanda is already experiencing the effects of climate change – unpredictable rainfall patterns, prolonged dry season, flooding, storms that destroy crops, landslides and erosion due to heavy rains.

decline in wage labour hours. The number of days worked in a year increased by 15% while the number of hours worked in a day decreased by 15%. Incomes increased by 38% over a four year period. Female beneficiaries now work in occupations that generate comparable returns as middle-income women. Improvements were recorded in the health and nutrition status of female participants, while household spending on education doubled and infant mortality fell. Fully 95% of participants have graduated from the CFPR programme.[4]

Concern Worldwide has adapted the 'graduation model'[5] to the Rwandan context, by combining several 'social protection' and 'livelihood promotion' aspects, including:

1. cash transfers to meet basic needs;
2. sensitisation and reinforcement of savings promotion activities for risk mitigation and potential investment in productive activities;
3. skills development and the provision of resources to enable the development of productive income generating activities (IGAs);
4. reinforce community-based support mechanisms to enhance non-farm employment;
5. capacity development to graduate into access to credit.

The specific outcomes aimed for by Concern's Graduation Programme are:

1. increased income to meet basic needs including access to food, shelter, education and health services;
2. increased skills and access to productive assets to sustainably generate income;
3. engagement in formal and informal financial services;
4. equality of outcome in male and female headed households;
5. reduced isolation of the extreme poor and improved social cohesion;
6. improved diversity of effective livelihoods options to reduce risk and vulnerability to shocks.

A seventh outcome is to have a comprehensive monitoring and evaluation (M &E) system, to produce and disseminate evidence and learning with regards to sustainable graduation from extreme poverty. Poverty is at the core of the analysis of sustainable graduation. Poverty is a multifaceted concept, including economic and social elements, and is generally conceived as either absolute or relative. Poverty is associated with lack of income, or failure to attain capabilities. It is a dynamic concept, changing and adapting according to consumption patterns, social dynamics and even

[4] The approach has been adopted by the World Bank's Consultative Group to Assist the Poor (CGAP), which has funded implementation of further pilots in 7 countries since 2006 (http://graduation.cgap.org/ wp-content/uploads/2012/10/Graduation-Program-Global-Meeting-2012-Summary-copy.pdf.)

[5] See CGAP – Ford Foundation Graduation Program (www.cgap.org/graduation).

technological change. For example, having access to a mobile phone today in many East African countries is seen as intrinsic to social and economic inclusion, but 10 years ago was considered as a luxury good.

Key activities of the Graduation Programme include:

- reinforcing community-based support mechanisms, in order to enhance income-generating opportunities and support for vulnerable and resource-poor groups in the informal economy and through social protection schemes;
- training community and local government leaders in implementation of social protection schemes that are designed to focus on enhancing the productive capacity of vulnerable and resource poor households;
- skills development and resource transfers to develop productive assets with an emphasis on entrepreneurship, marketing and income generation activities, savings promotion activities and asset transfers;
- documentation and dissemination of best practice in community-level social protection interventions and the graduation approach at local, national and international levels.

These activities are sequenced, starting with consumption support, followed by savings promotion, then skills training, and finally asset transfers. The Graduation Programme targets 1,200 extremely poor households in two cohorts, with 400 in the first cohort and 800 in the second. The first cohort was scheduled to receive cash transfers for 12 months (though this was extended to 18 months, for reasons explained above). The average value of cash transfers was RwF. 18,000 per month, based on the number of dependents in the household. Coaching of households is done by volunteer Community Development Animators (CDAs). Each CDA has approximately 15 households whom they visit at least twice a month. They work with households on planning and prioritising their problems and needs to be addressed using cash transfers; spending and savings plans; shared household decision-making and other programme-related activities.

1.1. Beneficiary communities and households

The Graduation Programme is located in two rural sectors, Kibeho and Rusatira, in the Districts of Nyaruguru and Huye in South Province. Kibeho is a remote rural area but Rusatira is less remote and is located near to the main road between Kigali and Butare. The sectors were selected based on an analysis of the poverty and vulnerability profiles of the two Districts, also taking into account the opinion of local government leaders. Sectors that had already benefited from the Government's VUP programme were excluded – Maraba, Kinazi, Rwaniro, Mukura and Karama in Huye; and Rusenge, Nyagisozi, Ngera and Kivu in Nyaruguru.

The two sectors selected for the Graduation Programme each had high proportions of poor and vulnerable people in their respective districts in 2010. In Huye District, Rusatira sector had the highest proportion of its population living in extreme poverty (13.7%), and the second highest proportion of its population belonging to one of four vulnerable groups (elderly, disabled, widow[er]s, orphans) (6.6%) (Table 1a). In Nyaruguru District, Kibeho sector has the highest proportion as well as the highest absolute number of extremely poor people in the district, based on the Ubudehe classification system (Table 1b).

Allocation of households to a Ubudehe category is done through a participatory process at village level. All households are allocated to one of 5 or 6 wealth categories, from the poorest to the richest. Those in the bottom two categories are considered by the members of their communities to be extremely poor and vulnerable. Analysis of FinScope 2012 data (by Pamela Abbott) indicates that 5% of households in Rwanda are in the bottom category and 26% are in the second poorest category.

Table 1: Vulnerable groups in Rutasira sector, Huye District and poorest male and female headed households in Ubudehe category 1 &2 in Kibeho sector, Nyaruguru District, 2010.

(a) Rutasira sector

Vulnerable group	Number (%)
Elderly	211 (0.8%)
Disabled	249 (0.9%)
Orphans	347 (1.3%)
Widows/widowers	985 (3.6%)
Very poor	3,716 (13.7%)
Total poor/vulnerable	5,508 (20.4%)
District population	**27,017 (100%)**

(b) Kibeho sector

Ubudehe categories	Number (%)
Ubudehe 1 – female	151 (10.7%)
Ubudehe 1 – male	70 (5.7%)
Ubudehe 2 – female	253 (14.2%)
Ubudehe 2 – male	187 (12.4%)
Sector: Ubudehe 1+2	661 (11.1%)
District: Ubudehe 1+2	**5,938 (100%)**

Source: Adapted from Concern Worldwide (n.d.)

Households targeted by the Graduation Programme were selected through a participatory process. Firstly, a household had to be classified in one of the bottom two Ubudehe categories. Next, the whole community of each village (divided in three groups of women, men and opinion leaders) were asked to identify the poorest households amongst them and the lists they drew up were then discussed and agreed by all adult members of the communities. A committee comprising of Local Cell Authority, Concern and partner staff validated the list to ensure that the poorest and

most vulnerable households that meet the programme selection criteria, were selected. Eligible households had to meet the following criteria:

- at least one adult member is able to work;
- landless or with less than 0.25ha of land;
- have no cattle;
- are not supported by another project;
- homeless;
- have no income-generating activity;
- no-one in the household has a secondary or technical school diploma.

The lists were posted on the Cell offices for the community to review and comment. A complaints response mechanism (CRM) was establishes and feedback from the community on selected households that did not meet the criteria were reported through the CRM, validated by the committee and any households excluded at this stage from the lists were replaced through consultation with the community. Ultimately, 400 extreme poor eligible households (200 from each sector) were selected from Nyaruguru and Huye districts, and approved by local government officials. Both male- and female-headed households were eligible, and almost two-thirds of households selected (64%) were female-headed.

1.2. Rationale and objectives of the 'second follow up survey - 48 months survey'

This report presents the findings from a quantitative survey conducted 48 months after 1st cohort participants on Concern Worldwide Rwanda's Graduation Programme received their first cash transfer (or 30 months after the final cash transfer was disbursed). Results presented in this report include information from a quantitative **baseline survey**, a '**first 12 months survey**' conducted 12 months after the first cash transfer was disbursed, a **first follow-up survey** conducted 18 months after the final cash transfer was disbursed and a **second follow-up survey** conducted 30 months after the final cash transfer was disbursed. This is a comprehensive set of research activities that aims to monitor and evaluate the impacts of the Graduation Programme against its objectives, recognising that it is important to understand and learn lessons from what works, what does not work and why. This report draws on information from four surveys to measure changes in indicators during a period of 48 months after the start of the programme.

The overall aims of the research activities are to identify:

- human and social indicators of graduation as well as income- or asset-based indicators;

- indicators of resilience and sustainability over time that go beyond reaching benchmarks or crossing thresholds at one point in time;
- different pathways to graduation, or graduation thresholds, for different participating households.

The Graduation Programme is expected to generate positive impacts on a range of areas that are being monitored by these research activities. Specifically, the following series of hypotheses will be tested in this report.

- Households that participate in the Graduation Programme will register sustainably lower levels of deprivation in comparison to control group households.
- Households that participate in the Graduation Programme will register sustainably higher levels of ownership of productive assets and/or consumption assets over time, in comparison to control group households.
- More households that participate in the Graduation Programme will sustain higher saving capacity and ability to borrow over time, in comparison to control group households.
- More households that participate in the Graduation Programme will show sustained investment in education, both for primary school age children as well as for secondary school age children over time, in comparison to control group households.
- More households that participate in the Graduation Programme will sustain higher investment in health and health related issues including hygiene and preventative health care for adults and children over time, in comparison to control group households.
- More households that participate in the Graduation Programme will sustain higher levels of social inclusion over time, in comparison to control group households.

For each of these hypotheses there are a number of indicators or outcomes which enables us to quantify whether the changes over time, that were the result of the Graduation Programme, are sustainable over time. These outcomes are being assessed after 48 months of programme implementation (or 30 months after the last cash transfer was disbursed).

The findings from the research will:

- contribute to our understanding of if, and how, the extremely poor can be supported to exit poverty sustainably using the graduation approach;
- contribute information and insights to inform the design and implementation of Rwanda's Vision 2020 Umurenge Programme (VUP);

- inform policy debates in other African countries around implementing social protection programmes for sustainable graduation from extreme poverty;
- contribute to global debates about the definition and conceptualisation of graduation;
- provide evidence on graduation from a sub-Saharan Africa Graduation Programme that can influence design of the global scale-up of the programme.

2. Methods

The aim of this report is to assess the sustainability of the changes in outcome indicators that have been recorded in previous reports that are likely to be attributable to the Graduation Programme. The latest round of data collection, which is known as the 48 month survey, contains information on the socioeconomic situation of households 48 months after the initial cash transfer and importantly 30 months after the last cash transfer. Since the questionnaire administered contains identical questions to those that were used to assess the baseline, 12 month survey, and 36 month survey, we are able to estimate the trend in the outcome indicator over a period of time. Using multivariate analysis, we are also able to identify patterns of graduation, or graduation thresholds, in order to assess the households who have been able to maintain sustained improved over time and whether these households have certain socioeconomic characteristics that serve as enablers of sustained improvement. These two issues will be explained in more detail in the subsections below.

2.1. Baseline, 12, 36 and 48 months surveys

To measure the impact of the programme it was necessary to have measurable indicators so that data can be collected before the programme starts (baseline survey), during the period of the cash transfer period (12 month survey), a period of time after the end of the cash transfer (36 months survey) and at the end of the project (48 months survey). This report contains information from all surveys collected.

The design of the surveys was developed in collaboration with Concern and the participation of stakeholders, including the Institute of Policy Analysis and Research (IPAR), SDA-Iriba and IDS. The method used to collect data to provide the basis for the measurement of the impact of the Graduation Programme was a survey of the beneficiary households and of control households. Baseline data for the beneficiary group for the Graduation Programme were collected prior to the programme starting in May 2011 and data for the control group were collected in December 2011. Similarly a survey was carried out 12 months post the initial cash transfer in August 2012 for both beneficiaries and control group, using the same questionnaire as used in baseline. For the 36 and 48 months surveys digital devices were used to collect information, thus minimising errors during data entry.

2.2. Sample

A 100% census of beneficiary households was included in all three surveys, making 400 households (200 per Sector) in the baseline, 390 households during the 12 month survey, 372 households during the 36 month survey and 375 households during the 48 month survey. The reduction of 10 beneficiaries from baseline to the 12 months survey was due to 10 beneficiaries dropping out of the programme. The reduction from 390 to around 372-375 beneficiary households was due to natural attrition from longitudinal studies. In addition, 200 households (100 per sector) were selected to be the control group by Concern. A sector not in receipt of VUP and not adjacent to the intervention sectors was identified and 200 households who were in the bottom two Ubudehe (participatory poverty) categories were sampled. Attrition for control group households has been as follows: from 200 households during baseline to 187 during the 12 month survey, to 192 during the 36 month survey and to 177 during the 48 month survey. There is an overall attrition rate of 12% for the control group, which is relatively small for longitudinal surveys (Capaldi and Patterson, 1987).

2.3. Questionnaire

The questionnaire was developed in consultation with Concern Worldwide Rwanda, stakeholders (listed above) and programme beneficiaries. The questionnaire was approved by Concern before data collection started. It was initially developed in English and then translated into Kinyarwanda. It was amended following discussions with stakeholders, and Concern and further amended following a pilot. Data collection was carried out using digital data devices by Concern staff. All interviews were carried out face to face in Kinyarwanda.

The 36 month questionnaire had the same design as the baseline and 12 month survey so that indicators can be compared over time. The questionnaire contained indicators that are highly correlated with income and consumption and were easier to collect. The questionnaire collected information on:

- assets (productive and non-productive);
- income-generating activities;
- financial inclusion and saving;
- housing conditions;
- diet and food security;
- child education;
- health;
- social inclusion and social capital.

2.4. Data analysis

There are two particular quantitative analyses used to show results: (1) trend analyses and (2) graduation thresholds and its determinants using multivariate analyses.

The analysis of trends in different outcomes is necessary to investigate the sustainability of changes in different indicators over time. To undertake this analysis we rely on the key outcome indicators which have been measured during all the survey rounds. These indicators have been measured for beneficiaries and control group, so we have the relative change in these indicators over four time periods. The first time period is important as this was carried out during the cash transfer period, when beneficiaries had received a full year of cash transfer (12 months), thus it is expected to capture changes in outcomes which were the result income changes. The 36 month period is important as it captures the potential effect of skills and coaching and thus the sustainability of the income effect over time. The 48 month period captures the sustainability of the project over time, when all support has been discontinued and it is expected that beneficiary households maintain a sustained improvement over time. The trend analysis indicate whether relative changes that were measured right after the end of the cash transfer remain sustained 30 months after the final cash transfer was disbursed.

Table 2 shows the potential outcomes of the trend analysis. It is important to highlight that results from the trend analysis have to be investigated relative to the result obtained in the 12 month survey. Therefore, we expect 5 possible results. A **sustained** improvement is obtained when we estimate a relative difference in the outcome in favour of beneficiaries between baseline and the 48 month survey and this estimated difference is similar, or even larger, than the one estimated between baseline and the 12 month survey. A **sustained but declining** result is obtained when there is a relative difference between beneficiaries and control group during the 48 month survey, but this difference is smaller than the one estimated during the 12 month survey. In other words, the initial improvement found in the 12 month survey is still found, but its value has declined or has reduced. At the extreme situation, we classified differently outcomes for which there was an initial difference during the 12 month survey, but this has completely **disappeared** during the 48 month survey. A **late improvement** is found for some outcomes for which finding a benefit takes time, whereas **no change** is used for outcomes for which there was no relative difference over time between treatment and control group.

Table 2: Potential outcomes of trend analysis

Potential result 48-month survey	Note
Sustained	There is still a relative improvement in the difference between treatment and control 48 months after the start of the programme AND this relative improvement is similar (or larger) to that estimated during the 12 month survey.
Sustained but declining	There is still a relative improvement in the difference between treatment and control 48 months after the start of the programme BUT the relative improvement is smaller than that estimated during the 12 month survey.
Late Improvement	There is a relative improvement in the difference between treatment and control 48 months after the start of the programme AND this relative improvement IS NOT found during the 12 month survey.
No change	There IS NOT relative difference on the outcome over time

The second part of the analysis deals directly with trying to determine graduation thresholds. The objective of this analysis is to investigate who are the households who are out of dependence of the project support and into sustainable livelihoods. To operationalise the concept of graduation we rely on information from Table 2 to estimate changes over time based on subjective thresholds from a combination of different outcomes or composite measures. The first step in this analysis is to identify what a potential threshold for graduation may be. This is a subjective assessment depending on the indicator at hand. If we have a poverty score indicator which combines 10 different outcomes, the graduation threshold may be achieving 6 out of these 10 outcomes. Although the selection of the threshold is subjective, in this report we establish the threshold based on the distribution of the indicator over time. Once this is established, then compare thresholds over time, whether individuals were below of above the threshold by the 12 month survey, right after the cash transfer ended, and their situation after the 36 and 48 months surveys.

Therefore, we can also established whether:

- Individuals had a sustained improvement, which meant moving from below the graduation threshold into the graduation over time and remaining above the graduation threshold.
- Individuals had a late improvement, which meant moving from below the graduation threshold into the graduation threshold towards the end of the project (i.e at the 48 month survey)

- Individuals who declined over time, which were individuals above the graduation threshold by the 12 month survey, but who dropped below the threshold by the 36 or 48 month surveys.
- Individuals with no change are those who remain always below the threshold.

For the sake of this analysis, we considered individuals who were always above the threshold in the "sustained" category. This also includes individuals who were above the threshold before the programme started and whose situation remained sustained over time, either due to the programme and a combination of other factors as it could be the case of beneficiaries, or due to livelihood strategies and other potential factors, as it is the case of control group households.

Once individuals have been identified into a category of graduation over time, multivariate analysis will be performed on beneficiaries and control group households separately to estimate the factors measured during baseline which are associated with the likelihood of being a household with sustained improvement, a household with late improvement, a household with declining improvement or a household with no change over time. For reasons explained in the results section, this analysis will be performed separately for beneficiaries and control group households.

2.5. Limitations

There are certain limitations of our research design which are worth highlighting here. First, beneficiaries were not selected at random, but targeted to be those most in need in selected sectors. To reduce the potential bias or the lack of random selection, control group households were selected using the same criteria as for beneficiaries (i.e. those households most in need) in sectors without VUP and without support from Concern. Secondly, it is impossible to isolate the potential impact of multiple interventions on households. It is possible that at any point in time during the intervention households, especially control group households, can receive support from the government or any other organisation. Thirdly, the timing for the collection of baseline information for beneficiaries did not coincide with that for control group households. It is possible, therefore, that results are somehow affected by seasonality effects as well as regional differences. Fourthly, although control group households were selected using the same criteria as beneficiaries it is likely that there are differences between the former and the latter. To verify the potential bias from seasonality and differences in selection criteria, a comprehensive baseline report was produced. From this report, it was concluded that there was enough statistical evidence to conclude that beneficiaries and control group households were similar across many different indicators during baseline.

In addition, control group households have been called upon to participate in the study, initially without any form of support for their time. It was decided that in subsequent

data collection exercises, that is subsequent from the baseline, a non-monetary payment will be given. During the 12 months post the initial cash transfer study control group households were given one hoe, worth 2,500 RWF (2.5 GBP). In subsequent data collection points it is possible that a larger incentive is given to reduce attrition. There is also the problem of survey fatigue. Control group households have been called to participate as control group for two different cohorts of beneficiaries. Control group households have been responding to several surveys, which increases the problem of survey fatigue. With survey fatigue households start to give errant responses to the survey or decide not to respond to certain sections. Missing data thus becomes a risk. It is for this reason that a larger incentive (small solar lamps) were planned for subsequent rounds of data collection.

The survey was designed around a score card to minimise data collection and to obtain relevant information around indicators for the outcomes of the programme. Although this is a good approach with important monetary benefits in terms of cost reductions, it lacks the depth required to investigate some of the issues discussed in this report. Deprivation, asset ownership, education, social inclusion, health are all concepts that require different indicators to be able to obtain a meaningful estimate of the programme effects. While the score card contains an indicator, we are unable to investigate the same concept, for example health, using different indicators. Therefore, we are limited by the indicators collected in the poverty score card.

In addition to the number of indicators collected by the score card, the design of the score card produced some inconsistencies and overlapping categories which could impact on the reliability of the estimates over time. In terms of the inconsistencies, the score card during baseline failed to account for filter questions so it was not possible to estimate some indicators for women only or for children only. This problem was corrected from the 12 month survey onwards, where we introduced a section which contained the household roster and thus we were able to identify male and female head of households, households with and without children among other important indicators. For overlapping categories, the score card during baseline allowed for a classification of the household structure which was overlapping. Households were able to be, for example, ‘a widow’ and ‘a woman living with children’. In order to avoid this issue, the 12 month survey information about the household composition is used to homogenise and re-estimate our models using the more reliable information. Finally, the ways in which data has been collected has change, since the baseline and 12 month surveys used a paper based questionnaire whereas the 36 and 48 month surveys used digital devices to collect information. Digital devices minimised data entry mistakes and data management issues.

3. Trend Analysis

This chapter presents findings from the trend analysis for outcomes using the baseline, 12, 36 and 48 months surveys. We assess whether any observed positive or negative changes in key outcomes have been sustained over time. Findings are presented on the following indicators: deprivation; ownership of productive assets and consumption assets; savings and borrowing; children's education; nutrition, hygiene and prevention; and engagement in social activities. We expect to see if the changes in outcomes have been sustained over time as a result of the programme, which included an 30 month cash transfer, asset transfer and business skill training.

3.1. Deprivation index

Overall Status
For the Deprivation Index, the results are '**Sustained but declining'**

Information was collected on several indicators of deprivation, including individuals' ability (or inability) to afford food, their (in)ability to afford to pay for membership of the government subsidised Mutual Health Insurance Scheme, and their (in)ability to purchase medicines. The responses to these questions were combined to construct a simple index to measure changes in deprivation between beneficiaries and the control group over time. The scale ranges from 0 (only eats a few times a week, can never afford health care or essential medicines), to 9 (eats three times a day, can always afford health care and basic medicines).

Hypothesis	Baseline		+12 months		+36 months		+48 months	
	Control	Treatment	Control	Treatment	Control	Treatment	Control	Treatment
Households that participate in the Graduation Programme will register lower levels of deprivation than at baseline, in comparison to control group households. (*The deprivation index is inverse, so a higher value represents lower levels of deprivation*)	2.26	1.94	2.51	6.96	3.75	5.89	2.71	4.64

IMPORTANT: Scale '0' is worst, 8 is best

Hypothesis: ***Households that participate in the Graduation Programme will register lower levels of deprivation over time, in comparison to control group households.***

At baseline the mean value of this index was 1.9 for the beneficiaries and 2.3 for the control group. The difference was statistically significant, meaning that, on average, control group households were initially less deprived than beneficiaries. During the one-year period after the first cash transfer, control group households recorded a small but statistically insignificant improvement in their average deprivation index value (from 2.3 to 2.5), while beneficiaries recorded a substantial and highly significant improvement (from 1.9 to 7.0) (Figure 1). The relative difference over the 12 month period was an average reduction in the deprivation index of 4.8. For the 36 month period, we find a slight improvement in well-being for the control group, with the overall index increasing from 2.2 from baseline to 3.7 after 36 months (Table 3). For beneficiaries, the improvement in well-being recorded after 12 months declined after the 36 month survey (although it remained relatively high compared with the control group). For the 48 month survey, we found that both control group and beneficiaries declined in the value of this indicator with respect to the value in the 36 month survey. Control group declined from 3.7 to 2.7 while beneficiaries declined from 5.9 to 4.6. The relative difference in deprivation index between beneficiaries and control group in the 48 months is still 2 points, however, this value has declined relative to the value found in the 12 month survey (4.8). Therefore, the overall result is a sustained but declining trend which continues to indicate a reversal of the positive effect of the programme found right after the end of the cash transfer (12 month survey).

Figure 1: Trends in deprivation index

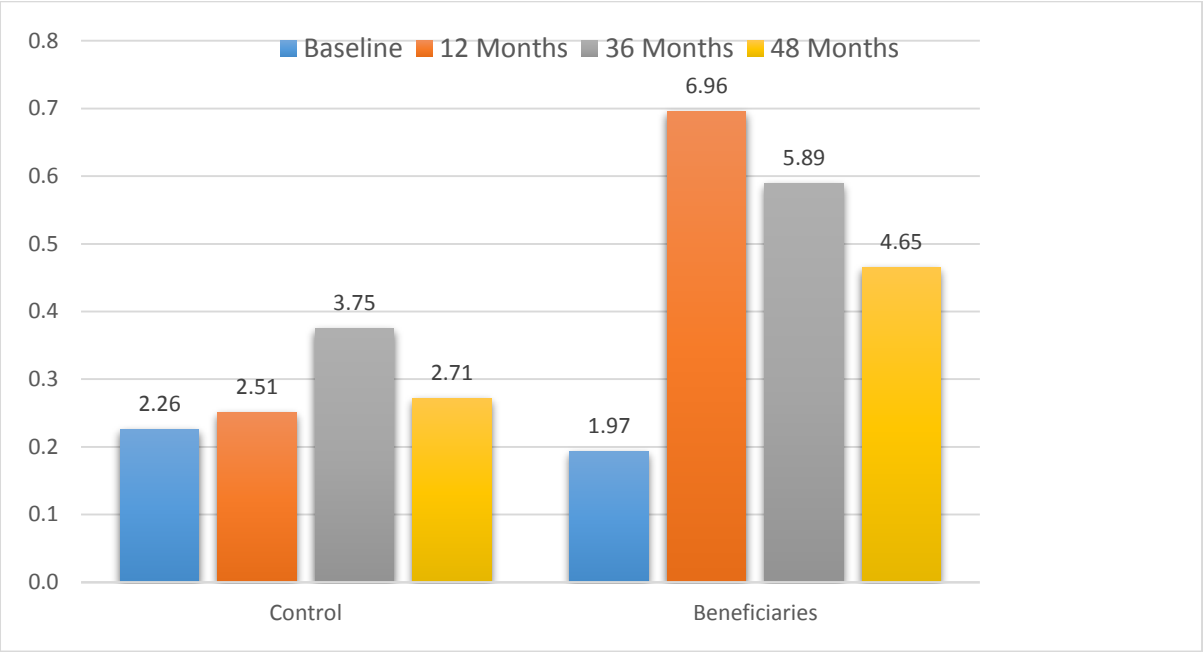


Table 3: Trend analysis for deprivation index

	Baseline	12 Months	36 Months	48 Months	Trend
Control	2.26	2.51	3.75	2.71	Cyclical
Beneficiaries	1.94	6.96	5.89	4.65	Cyclical
	Difference after 48 months relative to 12 months				*Sustained but declining*

Source: Impact Evaluation Data - Concern Worldwide Rwanda

3.2. Ownership of productive assets

Overall Highlights

- For ownership of productive assets, the results are '**Sustained'**
- When comparing beneficiaries and control households in productive asset ownership, the difference is statistically significant, at nearly two assets.
- Beneficiaries living on registered land more than tripled over time (from 25% to 62% and then further increase to 80%).
- Almost all beneficiaries after 48 months farm on more than one plot (increased from 23% at baseline to 66%, 76% and finally 91%),
- Nineteen percent (19%) of beneficiaries had acquired a cow, from a baseline of zero.

The second key hypothesis investigated in this report is whether the Graduation Programme enabled individuals to have a sustained increase in the ownership of productive assets. Productive assets are defined as assets that have the potential to generate future streams of income. As such, the hypothesis established was:

Hypothesis	Baseline		+12 months		+36 months		+48 months	
	Control	Treatment	Control	Treatment	Control	Treatment	Control	Treatment
More households that participate in the Graduation Programme will register higher levels of productive assets than at baseline, in comparison to control group households. (*Value represents an index of productive assets*)	3.10	2.43	3.27	4.59	2.82	4.48	2.58	4.54

IMPORTANT: Scale '0' is asset poor, '8' is asset rich

Hypothesis: ***Households that participate in the Graduation Programme will register higher levels of ownership of productive assets over time, in comparison to control group households.***

Firstly, the proportion of beneficiary households owning other domesticated animals (e.g. goats, pigs) increased from 7% during baseline to 81% during 12 month survey, 74% during 36 month survey and finally 79% during 48 month survey. For control group, the proportion of households owning domesticated animals increased from 9% to 19% from baseline to 12 month survey, then declined slightly to 14% during 36 month survey and finally increased to 17% during the 48 month survey.

Then, we generated an index for productive assets which combines information from eight different indicators: lives on own land; land is used for agriculture; amount of land used for agriculture; uses improved seed; owns a bicycle; owns a cow; owns other animals; owns at least one hoe. Our combined measure for productive asset ownership clearly shows a sustained improvement for beneficiaries. On a scale of 0 to 8 (where 0 means no ownership of any of the above productive assets and 8

indicates at least 1 of each of these assets), we find that the trend on productive asset ownership for the control group has not changed much, if any it shows a slight decline after 48 months. Conversely, beneficiaries increased their ownership of productive assets by slightly more than two assets, almost doubling their index value after the 12 months survey (from 2.4 to 4.6) and then remained at the level of 4.5 after the 36 and 48 months surveys (Figure 2).

Although the level of assets owned by beneficiaries was slightly lower during baseline, we estimate a sustained increase in productive asset ownership relative to the control group with the participation in the Graduation Programme. The difference in differences between beneficiaries and control households in productive asset ownership is statistically significant, at nearly two assets, even after 48 months from the start of the programme and the value has remained at a similar level since the 12 month survey (Table 4).

Figure 2: Productive asset index

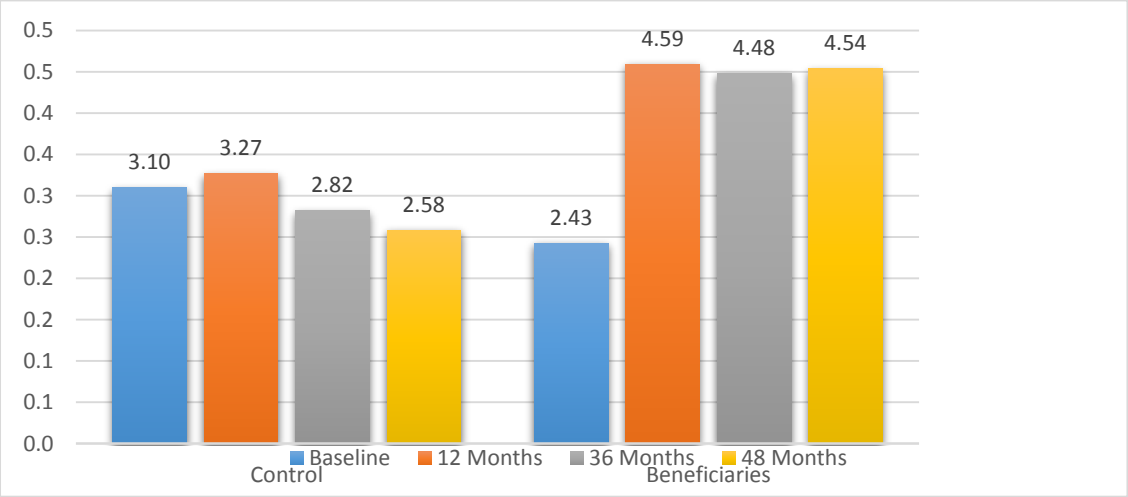


Table 4: Trend analysis for productive assets index

	Baseline	12 Months	36 Months	48 Months	Trend
Control	3.10	3.27	2.82	2.58	Slight downwards
Beneficiaries	2.43	4.59	4.48	4.54	Sustained upwards
	Difference after 48 months relative to 12 months				*Sustained*

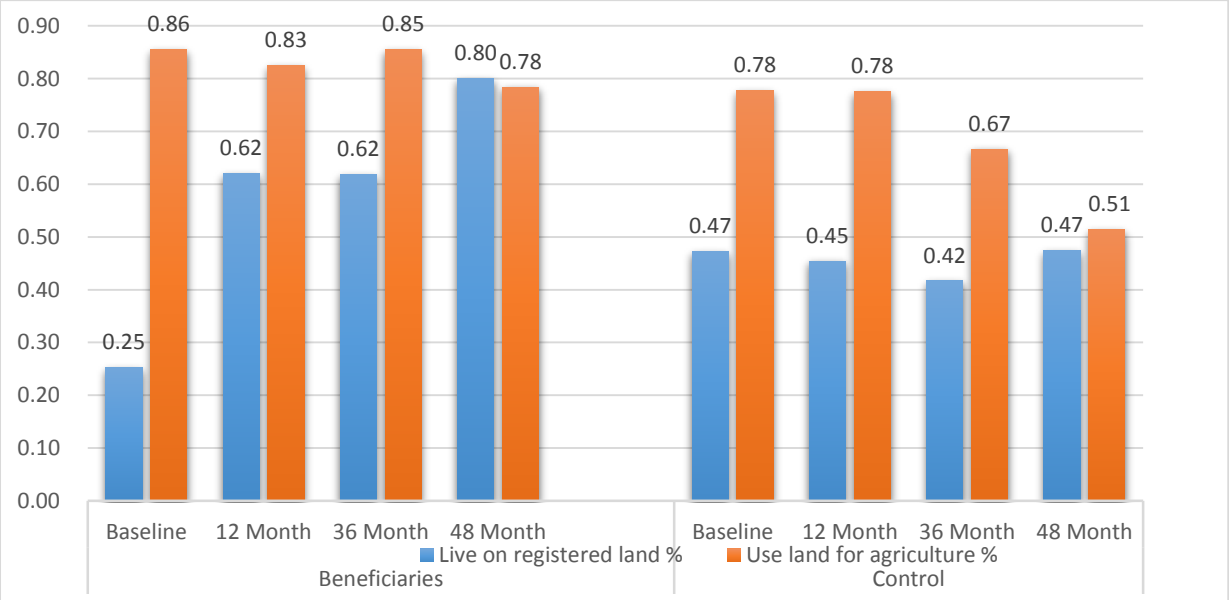
Source: Impact Evaluation Data - Concern Worldwide Rwanda

There are several indicators of productive assets that were investigated for the first cohort. In all surveys, respondents were asked about their access to land for agriculture and whether they use improved seeds for farming, their livestock ownership and whether they own farm tools and bicycles. These are relevant assets to monitor over time since the livelihoods of respondents are dominated by farming. The figures below show changes over time between beneficiary and control group households, for each of these key productive assets.

Living on Registered Land: At baseline, a significantly higher proportion of control group households than beneficiaries lived on registered land (47% *versus* 25%). Many beneficiaries apparently registered their land during the period of the project – the proportion living on registered land actually more than doubled between the 12 month and the 36 month surveys (25% to 62%) and further increased to 80% for the 48 month survey. For the control group, the proportion of households living on registered land did not change significantly over time (47% to 45% after 12 months to 42% after 36 months and 47% after 48 months). Although the proportion of beneficiary households living on registered land started off significantly lower than control group households, after 48 months it has remained significantly higher (Figure 3).

Use of Land for Agriculture: Figure 3 also shows trends in the proportion of households who use land for agriculture. During baseline, a high proportion of households for both beneficiaries and control group used land for agriculture (86% of beneficiaries and 78% of control group). The interesting trend for beneficiaries is that the proportion of households using land for agriculture has remained at the same level (between 78% and 86%) whereas the proportion of households who use land for agriculture for the control group has slightly declined over time (from 78% during baseline and 12 month survey to 67% after 36 month survey and 51% after 48 month survey).

Figure 3: Trends in land registration and land use

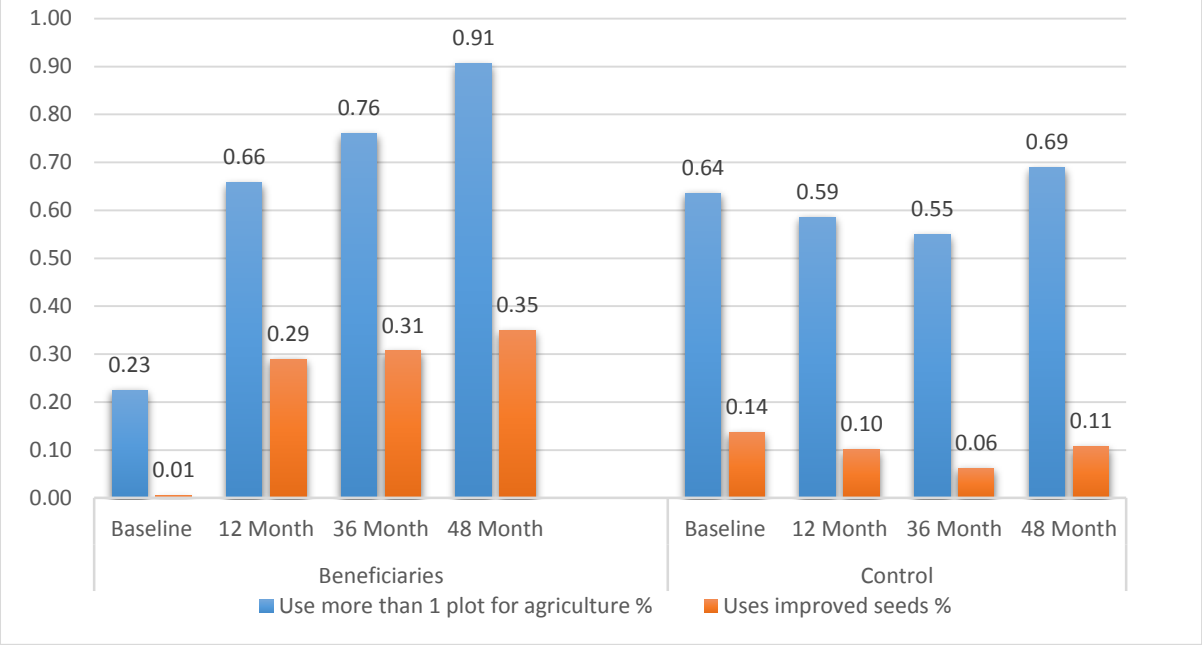


Using More than One Plot for Agriculture: Trends observed for households that used more than one plot of land for agriculture show that control group households started at a significantly higher level than beneficiaries (64% *versus* 23%), but the proportion of beneficiaries farming on more than one plot almost has constantly

increased over time, (from 23% to 66%, to 76%and finally to 91%), while control group households have followed a cyclical pattern, fallen first from 64% to 59% and 55% from baseline to 36 month survey and then increasing to 69% after 48 months (Figure 4:). It is possible that beneficiaries have been able to use the cash transfer to either purchase more land or to rent land out for farming. The size of land farmed would be an important indicator to analyse, as well as a measure of production, to be confident about changes in agricultural potential.

Using Improved Seeds: In terms of use of improved seeds, we found a significant increase in the proportion of beneficiaries who used improved seeds from baseline to the 36 month survey (from practically 0% to 29% during 12 month survey, to 31% during 36 month survey and to 35% during 48 month survey), but a cyclical trend for control group from 14% to 10%, to 6% and to 11% between baseline and 48 month survey (Figure 4).

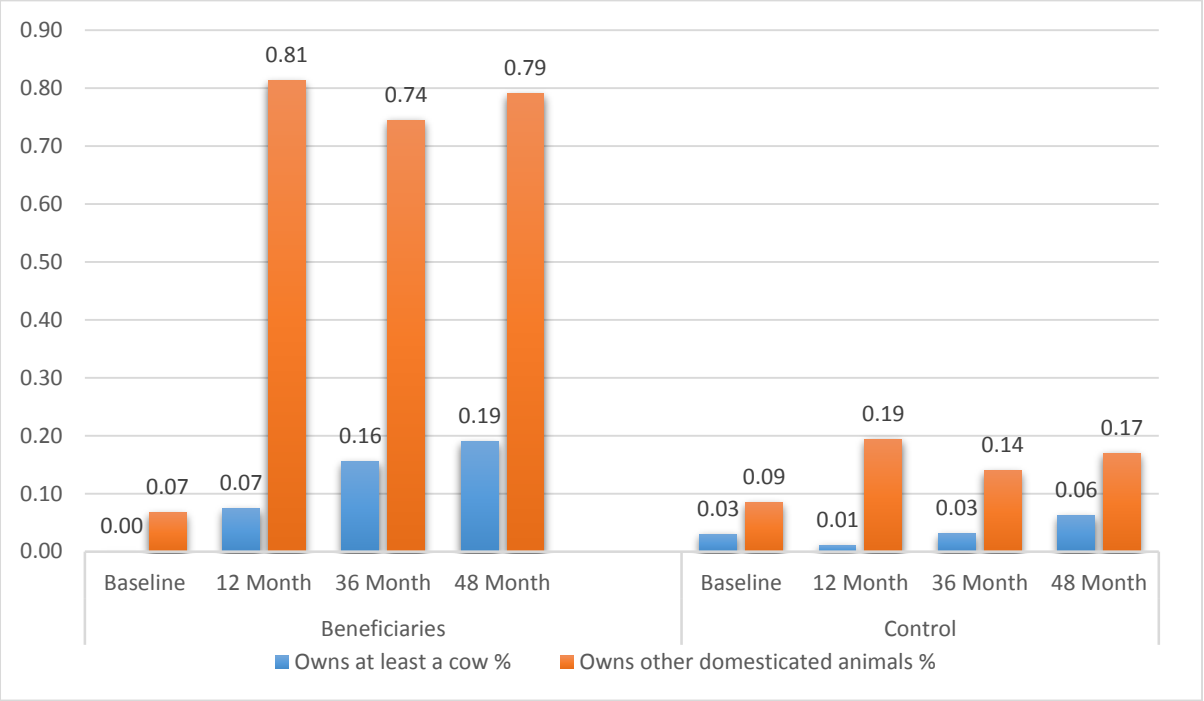
Figure 4: Trends in farming plots and use of improved seeds



Livestock ownership: Very few households in the survey owned a cow at baseline (no beneficiaries *versus* 3% of control group households). Thirty-six months after the first cash transfer 16% of beneficiaries had acquired a cow and at 48 month survey already 19% of beneficiaries had acquired a cow, from a baseline of 0 (Figure 5). The trend in terms of other domesticated animals (e.g. goats, pigs) was even more dramatic. While control group households owning animals other than cows has been cyclical, up after 12 months, down after 30 months and up again after 48 months (from 9% to 19% and then down to 14% and up to 17%), the proportion of beneficiary households owning other domesticated animals increased more than 10 times after 12 months and declined slightly, but remained high after 48 months (from 7% to 81% and then slightly down to 74% and up to 79%). This means that more than four times

as many beneficiaries as control group households owned other domesticated animals over time (Figure 5).

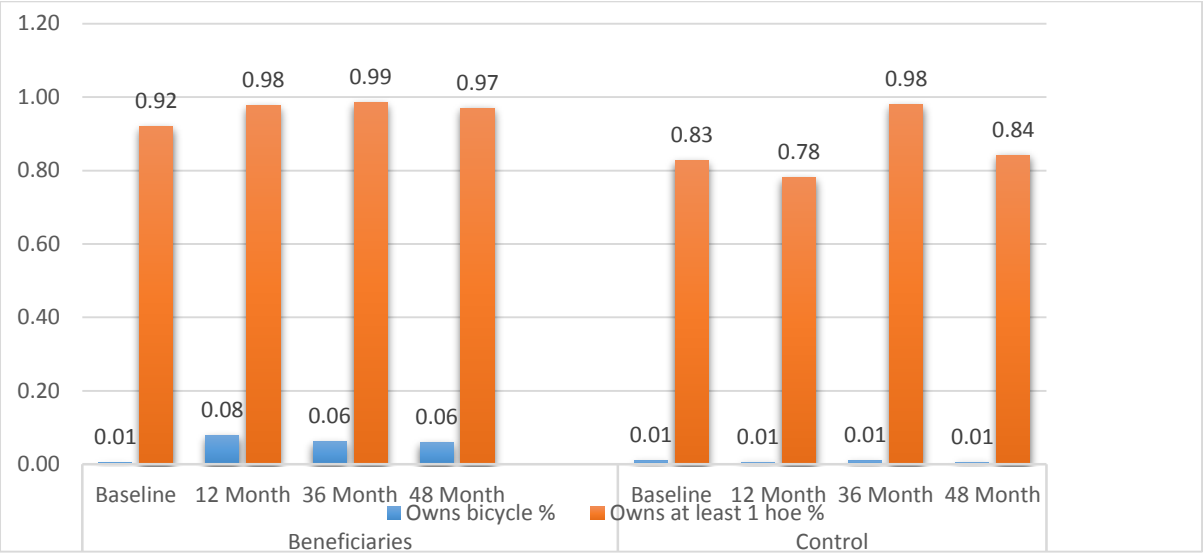
Figure 5: Trends in livestock ownership (cows and other domesticated animals)



Bicycle Ownership: Trends for bicycle ownership shows a significant increase from baseline to the 12 month survey (from only 1% to 8% of beneficiaries) and a slight decline after 36 month survey (back to 6% of beneficiaries) and remained at 6% after 48 month survey (Figure 6:). For control group, the trend in bicycle ownership has remained unchanged, with only 1% of control group who own a bicycle.

Hoe Ownership: For ownership of hoes, we find that more than 80% of control households and more than 90% of programme beneficiary households owned at least one hoe during the baseline survey. There was an upward trend for beneficiaries who almost all reported ownership of at least one hoe. For control group, there was a small decline after 12 months, but with an important increase after 36 months, and then a decline after 48 month survey. Although we did not find a relative change in hoe ownership after 36 months, the relative difference between beneficiaries and control group at 48 months is again more than 10 percentage points.

Figure 6: Trends in bicycle and hoe ownership



3.3. Ownership of consumption assets

Overall Highlights

- For ownership of consumption assets, the results are '**Sustained'**
- Beneficiaries more than doubled their average level of consumption asset ownership
- Almost all beneficiaries now own their house increasing from 45% to 96%.
- From a baseline of 1%, 25% of beneficiaries now own mobile phones
- Radio ownership by beneficiaries has risen almost threefold, from a baseline of 15% to 42%

Another outcome of interest for programme impact is whether there was an increase in consumption assets owned among beneficiaries. To synthesise the data on consumption assets, a simple index was constructed, being the sum of the following assets owned by households: house, saucepan, spoon or fork, plate, basin, jerry-can, chair, radio, mobile phone. For each household, the value of the index ranges from 0 (indicating extremely asset poor – no consumption assets owned) to 9 (indicating asset rich – ownership of at least one or some of each of these assets).

Hypothesis	Baseline		+12 months		+36 months		+48 months	
	Control	Treatment	Control	Treatment	Control	Treatment	Control	Treatment
More households that participate in the Graduation Programme will register higher levels of consumption assets than at baseline, in comparison to control group households. (*Value represents an index of consumption assets*)	4.45	3.44	3.71	6.87	4.77	7.98	3.87	7.09

IMPORTANT: Scale '0' is asset poor, '9' is asset rich

Hypothesis: ***Households that participate in the Graduation Programme will register higher levels of consumption assets over time, in comparison to control group households.***

Combining the information on consumption assets into a single index shows the expected results for overall changes in consumption assets over time (Figure 7). Beneficiaries doubled their average level of consumption asset ownership after 12 months, from 3.4 to 6.9 points (equivalent to an increase of 3.4 distinct assets) and continue to increase after 36 months (up to 7.2, which is equivalent to almost 4 different assets) and 48 months (maintained at a level of 7.1 assets). Conversely, control group households experienced a slight reduction in their ownership of consumption assets from baseline after 12 months, from 4.5 to 3.7 points and stagnated in the ownership of these assets after 36 and 48 months (3.8 is the value of consumption assets at the 36 and 48 months surveys). We find a sustainable increase in consumption assets in favour of beneficiaries over time (Table 5).

Figure 7: Trends in consumption asset index

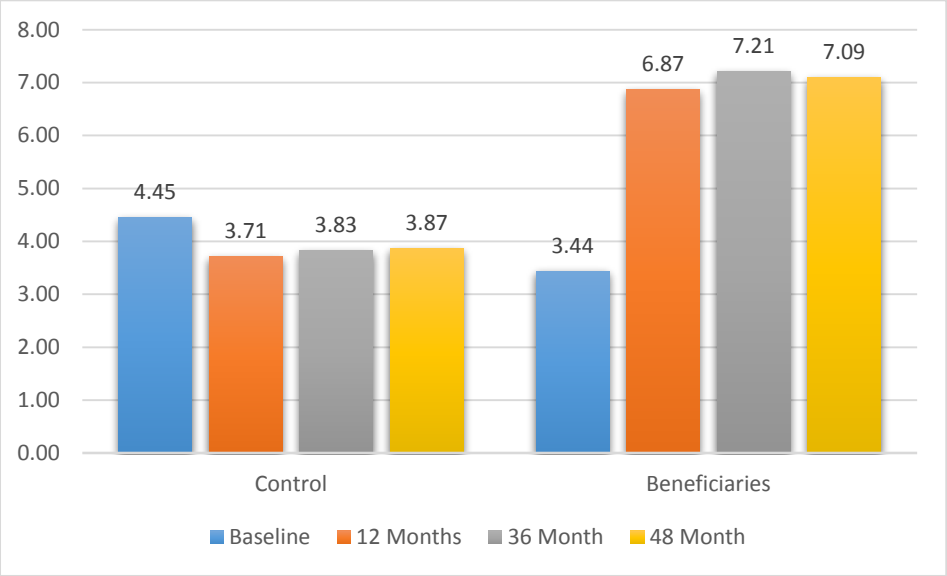


Table 5: Trend analysis for ownership of consumption assets

	Baseline	12 Months	36 Month	48 Month	Trend
Control	4.45	3.71	3.83	3.87	No change
Beneficiaries	3.44	6.87	7.21	7.09	Sustained upwards
	Difference after 48 months relative to 12 months				*Sustained*

Source: Impact Evaluation Data - Concern Worldwide Rwanda

Home Ownership: One of the most visible impacts of the Graduation Programme has been on home ownership. Before the programme started, more than half of beneficiary households were homeless (55%) and most of these were living with relatives or friends. One reason for this is pressure on land, but another is the government campaign to eradicate thatched roofing and the villagisation programme (see Box below).

Cash transfers disbursed by the programme financed the construction of many houses, and there has been a positive trend in house ownership. **Almost all beneficiaries reported owning their house after 48 months into the programme (trend increasing from 45% to 83% to 95% and to 96%).** For the control group, there have been a steady proportion of households who own their properties; around two thirds (
Table 6). This sustained increase in home ownership among beneficiary households is a major positive programme impact.

Box 1. Housing issues in rural Rwanda

Lack of Shelter: Background

Given the poverty status of the Graduation Programme beneficiaries, the vast majority of beneficiaries lived in sub-standard housing, with thatched roofing, prior to the onset of the programme. In 2010, there was a Government of Rwanda initiative to eliminate all houses with thatch roofing, the 'Bye-Bye Nyakatsi Campaign', requiring affected households to relocate to designated village sites (Villagisation or *Imidugudu*) and to construct houses with iron sheeting or tiled roofs.

Thatched roofs (*Nyakatsi*)

The thatched houses (*Nyakatsi*) eradication campaign is part of community development and social welfare programmes. The campaign aims at enforcing all Rwandans get access to decent home, thus enabling the Government to reorganize the rural settlement for social and economic transformation.

Source: Ministry of Local Government website

Villagisation (*Imidugudu*)

A 1997 ministerial-level decree stated that all new houses in rural areas were to be constructed only in *imidugudu*. Faced with land scarcity and an immediate housing crisis resulting from massive population displacements of the civil war and genocide, and later the return from exile of large numbers of Rwandans, the villagisation policy was initially intended as an emergency housing project. At the time of the implementation, however, it was redefined as an ambitious development programme establishing that all households living in scattered rural homesteads – the typical settlement pattern in Rwanda – should be regrouped into organised village settlements. On top of addressing the immediate housing shortage and the problems of arable land for agriculture, the major ambition is to improve service delivery and economic prospects for rural communities; by settling people in clusters, water, power, markets, schools, health centres and other services will be more readily available and accessible, stimulating non-farm income-generating activity and service provision and utilisation, but also freeing arable land for consolidated farming. Importantly, individuals who are still living within the valleys are encouraged to relocate into village settlements in order to expand arable land base because of high soil fertility and flowing water used for irrigation throughout the year in those areas.

Source: Rwanda Development Board website

		Beneficiaries					Control			
		Baseline	12 Month	36 Month	48 Month		Baseline	12 Month	36 Month	48 Month
Own house	%	0.45	0.83	0.95	0.96		0.55	0.58	0.61	0.65
Owns at least 1 soucepan	%	0.66	0.95	0.98	0.97		0.78	0.65	0.69	0.66
Owns at least 1 basin	%	0.40	0.92	0.90	0.85		0.56	0.41	0.48	0.47
Owns at least 1 jerrycan	%	0.67	0.91	0.95	0.91		0.66	0.47	0.45	0.47
Owns at least 3 spoons or forks	%	0.28	0.90	0.92	0.89		0.51	0.44	0.44	0.46
Owns at least 3 plates	%	0.25	0.84	0.88	0.89		0.45	0.37	0.35	0.38
Owns at least 1 chair	%	0.58	0.86	0.96	0.94		0.66	0.64	0.65	0.66
Owns mobile phone	%	0.01	0.12	0.23	0.25		0.03	0.02	0.06	0.07
Owns a radio	%	0.15	0.55	0.45	0.42		0.21	0.14	0.10	0.07

Table 6: Trends in different consumption assets

Household/Kitchen Assets Kitchen utensils are much smaller household and cheaper assets than a house, but very poor people and homeless people living with others often do not even own kitchen utensils (
Table 6). For saucepans, spoons and forks, plates and basins, there is a clear leapfrog effect: beneficiaries were less likely than control group households to own at least one or some of each of these items before joining the programme, but there has been an increasing trend in the ownership of these assets. The most dramatic changes were reported for plates, ownership of which increased more than three times among beneficiaries (from 25% to 84% of households from baseline to 12 month survey and to 88% and 89% after 36 and 48 months surveys) while changing cyclically quite significantly among control households (from 45% to 37%, to 35% and to 38%). It is likely that part of the dramatic increase in ownership of kitchen utensils is associated with the increase in home ownership – when formerly homeless people moved into their new houses, they probably stocked up on utensils and other basic household goods. Similar observations can be made about other household equipment and furniture, as represented by ownership of jerry-cans and chairs respectively. Beneficiary households increased their ownership of jerry-cans and chairs after joining the Graduation Programme, while some control households apparently lost these assets over the first 12 month period and have not recovered after the 36 month period.

Electronic Goods: Ownership of electronic goods is much lower among this population than is ownership of kitchen utensils, furniture and household equipment. At baseline, 21% of control households and only 15% of beneficiary households owned a radio. One year after the first cash transfer was given, radio ownership reported by control households had fallen by one-third, to 14%, but radio ownership among beneficiary households had risen almost fourfold, to 55% or over half of all beneficiaries. After 36 months, radio ownership declined for both beneficiaries and control group, remaining at 45% of beneficiaries and only 10% of control group. At the 48 month survey, 42% of beneficiaries reported having a radio while only 7% of control

group. Almost no households in these communities owned a mobile phone when the Graduation Programme started – only 3% of control group households and 1% of beneficiary households. There has been a steady increase in mobile phone ownership for beneficiaries, from 1% increasing to 12% after 12 months survey, 23% after the 36month survey and 25% after the 48 month survey. There was no significant change for control households over the 12 month survey and remained at levels of 6 to 7% during the 36 and 48 months surveys. It is possible that there is a substitution effect from radio to mobile phone, in particular given the importance of mobile phone for communication and making transactions and the possibility of using mobile phones to receive radio signal.

3.4. Savings and borrowing

Overall Highlights

- For Savings and Borrowing, the results are **Sustained but declining'**
- Although we found a declining trend from 12 month survey to the 36 month survey, the proportion of beneficiaries who saved by the 48 month survey was 84%
- The relative difference between beneficiaries and control group households found in the 12 month survey (80 percentage points) has declined over time (to 47 percentage points after 48 months).
- Up to thirty-Nine percent (39%) of beneficiaries reported taking loans. On average, the amounts borrowed by beneficiaries were much higher than loans taken by the control group

As part of the Graduation Programme, beneficiaries were asked to open a bank account, as this was the way in which cash transfers were disbursed. Since opening a bank account was mandatory for the beneficiaries, changes in the proportion of households who have a bank account is not seen as an impact of the programme but as compliance with the programme procedures.

Hypothesis	Baseline		+12 months		+36 months		+48 months	
	Control	Treatment	Control	Treatment	Control	Treatment	Control	Treatment
More households that participate in the Graduation Programme will have savings than at baseline, in comparison to control group households. (*Value represents proportion of households who saved*)	9%	12%	16%	96%	31%	76%	37%	84%

IMPORTANT: The proportion of households who saved is extracted from the question about places where people saved. Those who reported saving money at either formal or informal institutions are considered "households who saved".

***Hypothesis*: More households that participate in the Graduation Programme will have sustained savings over time, in comparison to control group households.**

Beneficiaries were also encouraged to save some money from the cash transfers provided. In this report, the way in which we operationalise savings is from responses to the question "*where do you save money*?". Households who reported saving into either formal or informal institutions were considered as those who saved, regardless of whether they saved any money during the period before the interview. Basic information showed in Figure 8 revealed that one year after the first cash transfer 96% of the beneficiaries reported that they had saved money, from a baseline of 12%, mostly in a SACCO. However, this trend has followed a cyclical pattern since after 36 months into the programme 76% of beneficiaries reported savings and after 48 months 84% of beneficiaries reported savings. The situation for the control group is somehow different, since there has been an increasing proportion of households saving over time. The relative difference between beneficiaries and control group households reached a maximum point after the 12 month survey, just at the end of the final cash transfer, and then declined for the 36 and 48 month surveys, both because more control group households were saving but also since not all the beneficiaries managed to maintained sustained savings over time (Table 7).

Using information from the survey one year after the first cash transfer and considering only those who managed to have positive savings, we found that, on average, beneficiaries saved RwF2,600 per month whereas control households saved less than half of this amount, only RwF.1,080 per month. Using information from the 36 month

survey we found that beneficiaries who reported positive savings managed to save, on average, RwF 2,550 per month whereas control group households RwF 1,220 per month. For the 48 month survey, average savings for the control group was RwF 1,190 and RwF 2,770 for the beneficiaries. Monthly savings have not changed over time between the 12 and the 48 month surveys.

Figure 8: Trends on whether household has savings

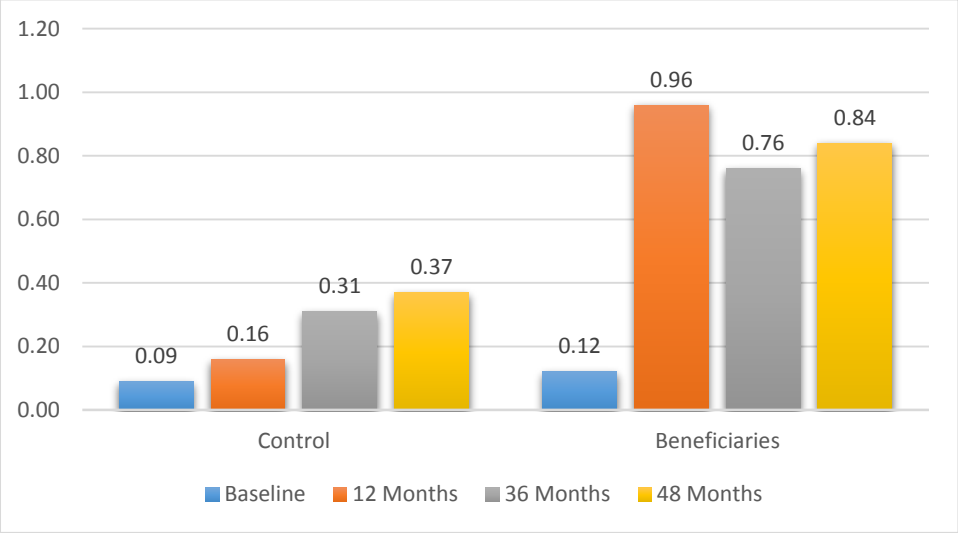


Table 7: Trend analysis for whether households save money

	Baseline	12 Months	36 Months	48 Months	Trend
Control	0.09	0.16	0.31	0.37	Increasing
Beneficiaries	0.12	0.96	0.76	0.84	Cyclical
	Difference after 48 months relative to 12 months				*Sustained but declining*

Information about taking loans was only collected from the 12 month survey; hence we only have information on three points in time and no baseline. Our results showed that 88 beneficiaries took loans (slightly over 20%) whereas only 20 control group households took a loan (10%) one year after the first cash transfer (12 months survey). Thirty-Six months after the start of the programme we find that the number of beneficiaries who reported taking a loan during the previous year was 145 (equivalent to 39% of beneficiaries) and for the 48 month survey 112 beneficiaries reported taking a loan (equivalent to 30% of beneficiaries). For control group, the number of households who reported taking a loan within the previous year to the 36 month survey was 26 (only 13.5% of control group households) and 28 for the 48 month survey (only 15% of control group). We found, therefore, an increasing propensity to take loans by beneficiaries, while this has not been the case for control group households.

On average, the amounts borrowed by beneficiaries during the 12 month survey were much higher than loans taken by the control group. Using information only on beneficiaries who took a loan less than RwF.20,000 (to eliminate outliers which can distort the average), beneficiaries took loans worth RwF.5,800 on average whereas control group households took loans worth only RwF.3,100. Using the same cutting off criteria to estimate the average value of loans in the 36 month survey, we found that beneficiaries and control group borrowed similar amounts, RwF 7,314 and RwF 8,022 for beneficiaries and control group households, respectively. For the 48 month survey, beneficiaries took loans worth RwF 9,448 whereas control group took loans worth RwF 5,666. The amount borrowed has increased substantially between the 12 and the 48 month surveys.

In the 36 and 48 months surveys, information was also collected on whether the loan taken during the last year was repaid by the time of the survey. Our results showed that 38% of beneficiaries had repaid the loan both in the 36 and 48 months surveys whereas only 23% and 25% of control group households did in the 36 and 48 months surveys, respectively.

Respondents were also asked to answer a question about their potential to borrow funds given their current situation (one during the 12, 36 and 48 months surveys). *"How much money could you dare to borrow now?*" During the 12 month survey, control households reported, on average, a higher amount (RwF.147,300) than beneficiaries (RwF.133,300), the difference though not statistically significant. During the 36 and 48 months surveys, beneficiaries reported a lower amount for borrowing (RwF 101,521 during the 36 month survey and RwF 118,600 during the 48 month survey) than control group households (RwF 130,578 and RwF 127,079 after the 36 and 48 months surveys, respectively) and this time the difference is statistically significant. The reduction in reported amount borrowed by beneficiaries could indicate that they do not see the need to borrow as much money as their situation has improved over time. It could also mean that beneficiaries, given that they are more likely to save and borrow, that their actual estimate for the amount that they dare to borrow is lower than that reported by the control group.

3.5. Children's education

Overall Highlights

- For primary school enrolment, there is **No Relative Difference** between Treatment and Control. The number of children from beneficiary households going to primary school has increased from 63% to 84%. This progress is matched by control households
- For affordability of school uniform, the results are **Sustained**. The proportion of beneficiaries who could afford uniforms for most or all children increased from 7% during baseline at 83%.

Another important indicator in terms of programme effects is children's education. Although primary education is free in Rwanda, there are associated costs such as uniforms and scholastic materials. Poor households may not send their children to school if they cannot afford the associated costs of schooling, or if the opportunity cost of sending children to school is too high. Alternatively, families may not send their children to school if they perceive the quality of education as very bad or if there is no school nearby.

During the baseline survey information was gathered on children's education. The key question asked to households was to respond the proportion of children of primary school age in primary school and the proportion of children of secondary school age in secondary school. These questions aimed to gather information on age in grade, that is to know whether primary school age children were in primary school. Unfortunately, the survey did not collect information on the age of children in a household roster, therefore we were unable to verify the accuracy of the responses and to select from the responses only those households with primary school age children. For the second survey, household roster information was collected and the same questions about the proportion of children of primary school age and secondary school age in primary and secondary school were also recorded. Unfortunately, for the 36 month and 48 months surveys, although information was collected on a household roster and this time with information on whether children were in school or not, the question about children of particular age in particular grade of school was asked differently. This time the question was to recall the proportion of children in school. For primary school children this is not too problematic, as it is almost impossible to have primary school age children in secondary school. However, for secondary school age children this was not the case. It is possible to have over age children in school, therefore the meaning of the previous questions "children of secondary school age in secondary school" was now interpreted as "children in school" and thus secondary school age children could have been in primary school.

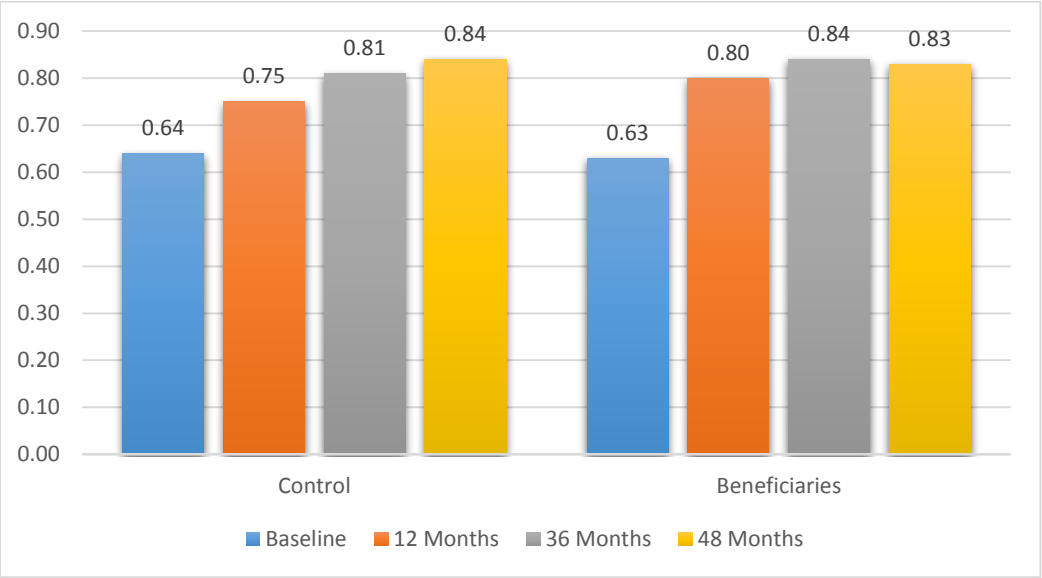
Hypothesis	Baseline		+12 months		+36 months		+48 months	
	Cont.	Treat.	Cont.	Treat.	Cont.	Treat.	Cont.	Treat.
More households that participate in the Graduation Programme will send some or all of their primary school-age children to primary school than at baseline, in comparison to control group households. (*Value represents proportion of children*)	64%	63%	75%	80%	81%	84%	83%	84%
More households that participate in the Graduation Programme will send some or all of their secondary school-age children to secondary school than at baseline, in comparison to control group households. (*Value represents proportion of children*)	11%	10%	15%	23%	n.a.	n.a.	n.a.	n.a.
More households that participate in the Graduation Programme will their primary school-age children (6 to 13) to school P1 to S3 than at baseline, in comparison to control group households. (*Value represents proportion of children*)	n.a.	n.a.	n.a.	n.a.	84%	85%	83%	82%
More households that participate in the Graduation Programme will send their secondary school-age children (14 to 16) to school P1 to S3 than at baseline, in comparison to control group households. (*Value represents proportion of youth*)	n.a.	n.a.	n.a.	n.a.	71%	76%	73%	70%

IMPORTANT: The survey enabled the differentiation between children and young people attending different grades of school.

***Hypothesis*: More households that participate in the Graduation Programme will send some or all of their primary school-age and secondary school-age children to school in comparison to control group households.**

Figure 9 reveals the trend in the proportion of households that have primary school age children in primary school. We find that over time an increasing proportion of households are sending their children to primary school. While beneficiaries were more likely to send their children to school after 12 months from participating in the programme, control group households are catching up. Figure 9 shows that the proportions of children in beneficiary households who were attending school increased from a baseline of 63% to 80% after 12 months and to 83% after 48 months. For control group households, children attending primary school increased from 64% to 73% after 12 months and to 81% after 36 months and finally to 84% after 48 months. **There is no relative difference over time in the proportion of children attending primary school between beneficiaries and control group households.**

Figure 9: Trends on primary school enrolment



For households who have children of secondary school age, participation in education was recorded higher for beneficiaries after 12 months into the programme, but there is no data to match this trend for the 36 and 48 month surveys. Using the 36 and 48 months surveys we find that almost three-quarters of secondary school age children are either in primary or secondary school and there is no relative difference between control group households or beneficiaries.

Affordability of school uniforms is an important aspect of financial barriers to education. In other words, the transfer is helping to alleviate school access costs. Table 8 shows that 12 months after the programme, the proportion of beneficiaries who could afford uniforms for most or all children increased from 7% during baseline to 76% after 12 months. This proportion remained high at 74% and 83% after 36 months and 48 months for beneficiary households, respectively. For control group households there has been a slow increase in the proportion of households who can afford school uniforms for most or all children (increasing from 14% to 33% and to 46% from

baseline to 12 month survey to 36 month survey and remaining at 47% during the 48 month survey). **The relative difference over time is still positive in favour of beneficiaries after 48 months.**

Table 8: Trend analysis for proportion of households who have most or all children with school uniforms

	Baseline	12 Months	36 Months	48 Months	Trend
Control	0.14	0.33	0.46	0.47	Upwards
Beneficiaries	0.07	0.76	0.74	0.83	Sustained upwards
	Difference after 48 months relative to 12 months				*Sustained*

Source: Impact Evaluation Data - Concern Worldwide Rwanda

3.6. Nutrition, hygiene and prevention

Overall Highlights

- The proportion of beneficiary households consuming meat at least once a week has showed constant increments until the 36 month survey, but declined during the 48 month survey.
- The proportion of beneficiary households consuming milk at least once a week increased from 4% to 27% after 36 month survey, but then declined to 17% during the 48 month survey.
- For growing their own vegetables, beneficiary households increased from 29% to around 80%
- For growing their own fruit, beneficiary households increased from 29% to 71%, but declined to 55% during 48 month survey.
- There was not a significant difference between the perception of the presence of malnutrition within the households amongst beneficiaries or control groups.
- The relative difference between the proportion of beneficiary households sleeping under a mosquito net and that of the control group has remained high since the 12 month survey.
- Although there were improvements in the use of laundry soap and change of clothes, the relative difference over time between beneficiaries and control group has narrowed over time.

We have already indicated that the deprivation index contains information on the individuals' ability to afford food, individuals' ability to afford to pay for membership of the Mutual Health Insurance Scheme as well as their ability to purchase medicines. Hence these indicators are not reviewed here again. Instead we focus on whether households increased their consumption of meat, whether they started fruit and vegetable gardens (kitchen gardens), whether they increased their weekly consumption of milk and whether they perceived that fewer children or other household members suffered from symptoms of malnutrition over time.

***Hypothesis 26*: More households that participate in the Graduation Programme will improve their nutrition, hygiene and health prevention over time, in comparison to control group households.**

Figure 10 shows trends for the consumption of meat and milk by beneficiary and control group households. We find that while the consumption of meat and milk has been cyclical for control group households, that is decreasing during the 12 months relative to the baseline and then increasing again during the 36 month survey and then decreasing substantially again during the 48 month survey. For beneficiaries, consumption of meat increased substantially after the end of the cash transfer (from 8 to 41%), then remained at a sustained level of around 39% of beneficiaries consuming meat at least once a month, and then declining to 21% during the 12 month survey. As we have indicated previously, it is possible that the cash transfer induced an income effect and thus enabled households to increase their consumption of these products.

Figure 10: Trends on proportion of households eating meat and drinking milk

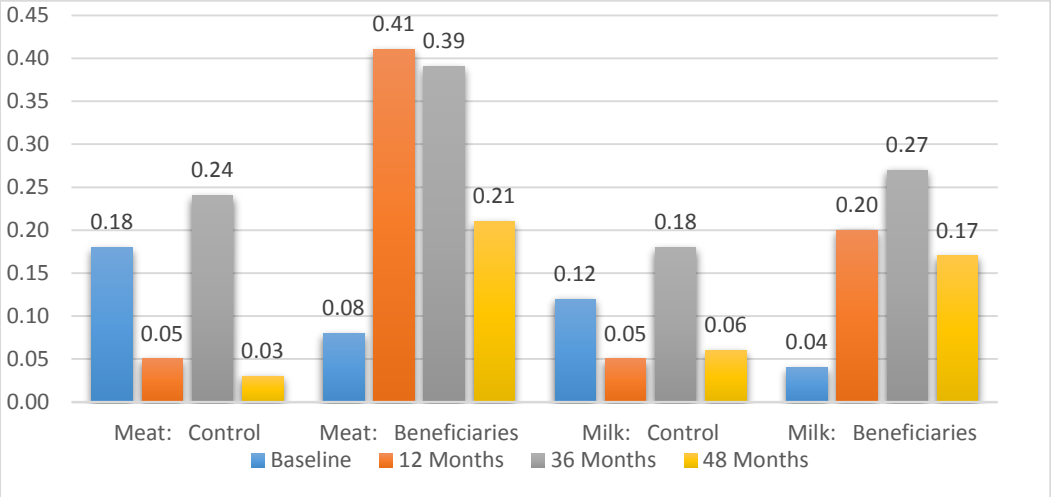


Table 9 shows that the proportion of beneficiaries consuming milk at least once a week increased, from 4% during baseline, to 20% during the 12 month survey and to 27% during the 36 month survey and down to 17% during the 48 month survey. For control group households, there was also a cyclical pattern in the reported consumption of milk. What is important is that the relative consumption of meat and milk has been in favour of beneficiaries, but the highest relative difference was obtained right at the end of the end of the cash transfer, indicating the peak of the income effect, and then slowly declining over time.

Table 9: Trend analysis for proportion of households eating meat and drinking milk

	Baseline	12 Months	36 Months	48 Months	Trend
Eating Meat at least once a month					
Meat: Control	0.18	0.05	0.24	0.03	Cyclical
Meat: Beneficiaries	0.08	0.41	0.39	0.21	Cyclical
Difference after 48 months relative to 12 months					*Sustained but declining*
Drinking milk at least once week					
Milk: Control	0.12	0.05	0.18	0.06	Cyclical
Milk: Beneficiaries	0.04	0.20	0.27	0.17	Cyclical
Difference after 48 months relative to 12 months					*Sustained but declining*

Supporting our previous finding about an increase in consumption of meat and milk, Figure 11 and Table 10 show that beneficiaries have also increased their likelihood to produce their own vegetables and fruit, particular with the creation of kitchen gardens. For growing vegetables and fruit, we found that the continuous increase in the proportion of beneficiaries who grow their own products up to the 36 month survey actually declined for the 48 month survey. This cyclical pattern however, was also shown by control group. For growing vegetables, the proportion of beneficiary households increased from 74% during the 12 month survey to 89% during the 36 month survey and then slightly declined to 80% during the 48 month survey. For growing fruit, the proportion of beneficiaries increased from 53% during the 12 month survey to 71 during the 36 month survey and then declined to 55% during the 48 month survey. It is important to highlight that the increase in the proportion of households who grow their own products between the 12 and the 36 month surveys and who then declined between the 36 and the 48 month survey was also found for control group. Therefore, the pattern of consumption follows some general economic cycles, affecting all Rwandan families. Nonetheless, the relative advantaged shown by beneficiaries is still present even after 48 months.

Figure 11: Trends on proportion of households growing their vegetables and fruit

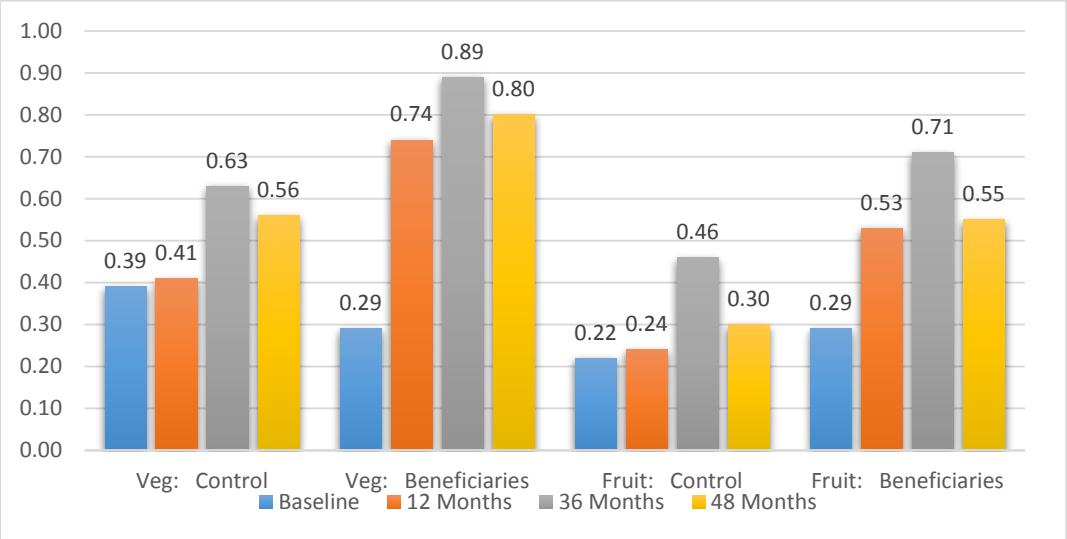


Table 10: Trend analysis for proportion of households growing vegetables and fruit

	Baseline	12 Months	36 Months	48 Months	Trend
Grow vegetables					
Veg: Control	0.39	0.41	0.63	0.56	Cyclical
Veg: Beneficiaries	0.29	0.74	0.89	0.80	Sustained upwards
	Difference after 48 months relative to 12 months				*Sustained*
Grow fruit					
Fruit: Control	0.22	0.24	0.46	0.30	Cyclical
Fruit: Beneficiaries	0.29	0.53	0.71	0.55	Cyclical
	Difference after 48 months relative to 12 months				*Sustained*

In the absence of anthropometric[6] measurements of individual nutrition status, a subjective indicator was applied: respondents were asked for their perception of the prevalence of malnutrition in their households. Interestingly, fewer beneficiary households (25%) reported having household members with symptoms of malnutrition in the baseline survey compared to control group households (42%). During the 12 month survey, both sets of households reported improvements in terms of perceived symptoms of malnutrition within their households, which halved among beneficiary households (from 25% to 12%) and fell by a smaller proportion among control group households (from 42% to 31%). By the 36 month survey, the trend in perceived malnutrition continued to decline, with only 2% and 8% of beneficiaries and control group households reporting perception of malnutrition within their households. The declining trend continued so that by the 48 month survey only 1.5 and 7% of beneficiaries and control group households perceived malnutrition within their household (Table 11). When comparing the relative change over time between beneficiaries and control group households we find that this is not significant, since

[6] Refers to measurement of human being: weight/height etc.

both groups reported a reduction in subjective malnutrition within their respective households.

Table 11: Trend analysis for perceived malnutrition

	Baseline	12 Months	36 Months	48 Months	Trend
Control	0.42	0.31	0.08	0.07	Sustained downwards
Beneficiaries	0.25	0.12	0.02	0.01	Sustained downwards
Difference after 48 months relative to 12 months					*No change*

Source: Impact Evaluation Data - Concern Worldwide Rwanda

In terms of hygiene and preventive measures, households reported on whether their members sleep under mosquito nets (all do, some do, few do, none do), the frequency of using soap (always, often, sometimes, rarely, never), and the frequency of changing clothes (every 2 days, every 3 days, every 4 to 5 days, once every 2 week, once every month). Since these are also categorical ordinal variables we employed an ordered logit model for the estimation of the difference in difference parameter.

Results show that beneficiaries continue to have a sustained benefit in terms of improved prevention and hygiene relative to the control group (Table 12), but for some indicators the relative difference found right after the end of the cash transfer has declined after the 48 month survey. For instance, the proportion of beneficiaries having some or all of their household members sleeping under a mosquito net has improved from 64% after the 12 month survey to 90% during the 36 month survey, but then declined to 68% after the 48 month survey. The proportion of control group households who sleep under mosquito nets increased from 57% to 68% between the 12 and the 36 month survey, and also declined to 50% after the 48 month survey. For this indicator, the relative difference found during the 12 month survey (7 percentage points) has increased in the 36 month survey (22 percentage points) and in the 48 month survey (18 percentage points). The relative change is higher for beneficiaries, making this an improvement over time.

For beneficiaries who use laundry soap (either often or always), we find a cyclical patterns for both control group and beneficiaries, with a more declining proportion of beneficiaries using laundry soap either often or always. During baseline, the proportion of beneficiaries who used laundry soap either often or always was 34% and only 19% of control group. During the 12 month survey, the proportion of beneficiaries using laundry soap often or always increased to 88% and remained high (at 76%) during the 36 month survey, but then declined to 61% during the 48 month survey. For control group households, there was a slight increase over time, increasing to 21% and 37% during the 12 month and the 36 month surveys, and then declining to 28% after the 48 month survey (Table 12). Therefore, beneficiaries ended up in a better situation after the 12 month survey, but the gap between beneficiaries and control group has narrowed over time.

For changing clothes, the situation is somehow similar. Between the baseline and 36 month surveys, the control group showed a cyclical trend, (the proportion of households who changed clothes 2 or 3 times per week decreased from 24% during baseline to 19% during 12 month survey and increased to 26% during the 36 month survey then increase again to 30% during the 48 month survey). For beneficiaries, the large increase in the proportion of households who changed clothes regularly from baseline to the 12 month survey (from 11% to 64%) remained relatively high during the 36 month survey (at 60%) and then declined to 55% during the 48 month survey. Therefore, the relative difference found in the 12 month survey has declined after 48 months (from 45 percentage points to 25 percentage points).

Table 12: Trend analysis for perceived indicators of hygiene and prevention

	Baseline	12 Months	36 Months	48 Months	Trend
Mosquito Nets					
Control	0.60	0.57	0.67	0.50	Cyclical
Beneficiaries	0.76	0.64	0.89	0.68	Cyclical
Difference after 48 months relative to 12 months					*Sustained*
	Baseline	12 Months	36 Months	36 Months	Trend
Laundry Soap (always or often)					
Control	0.19	0.21	0.37	0.28	Cyclical
Beneficiaries	0.34	0.88	0.76	0.61	Cyclical
Difference after 48 months relative to 12 months					*Sustained but declining*
	Baseline	12 Months	36 Months	36 Months	Trend
Change Clothes (every 2 or 3 days)					
Control	0.24	0.19	0.26	0.30	Cyclical
Beneficiaries	0.11	0.64	0.60	0.55	Cyclical
Difference after 48 months relative to 12 months					*Sustained but declining*

Source: Impact Evaluation Data - Concern Worldwide Rwanda

3.7. Engagement in social activities

Overall Highlights

- For engagement in social activities, two indicators, participating in women's meetings and membership of cooperatives are '**Sustained'**, whereas for church attendance and participation in *Umuganda* the trend is '**Sustained but declining**'.
- For all 4 indicators there has been a decline in participation between the 36 and the 48 months surveys for both control group and beneficiaries. Still, beneficiaries maintain a relatively higher participation in all social activities compared with control group.

The Graduation Programme is expected to help individuals to engage more in social activities. Poor and vulnerable individuals often withdraw from social activities or else are excluded from communal activities, either because poverty reduces the time and money they have available for social events and commitments – all of their resources

have to be allocated to securing their basic needs – or because they have feelings of shame (for example if they do not have good enough clothes to attend meetings). We investigate trends in engagement in social activities for different indicators of participation.

Hypothesis	Baseline		+12 months		+36 months		+48 months	
	Cont.	Treat.	Cont.	Treat.	Cont.	Treat.	Cont.	Treat.
More households that participate in the Graduation Programme will be attending women's meetings than at baseline, in comparison to control group households. (*Value represents proportion of households*)	69%	62%	64%	80%	67%	79%	58%	72%
More households that participate in the Graduation Programme will be members of cooperatives than at baseline, in comparison to control group households. (*Value represents proportion of households*)	26%	18%	18%	75%	32%	75%	28%	65%

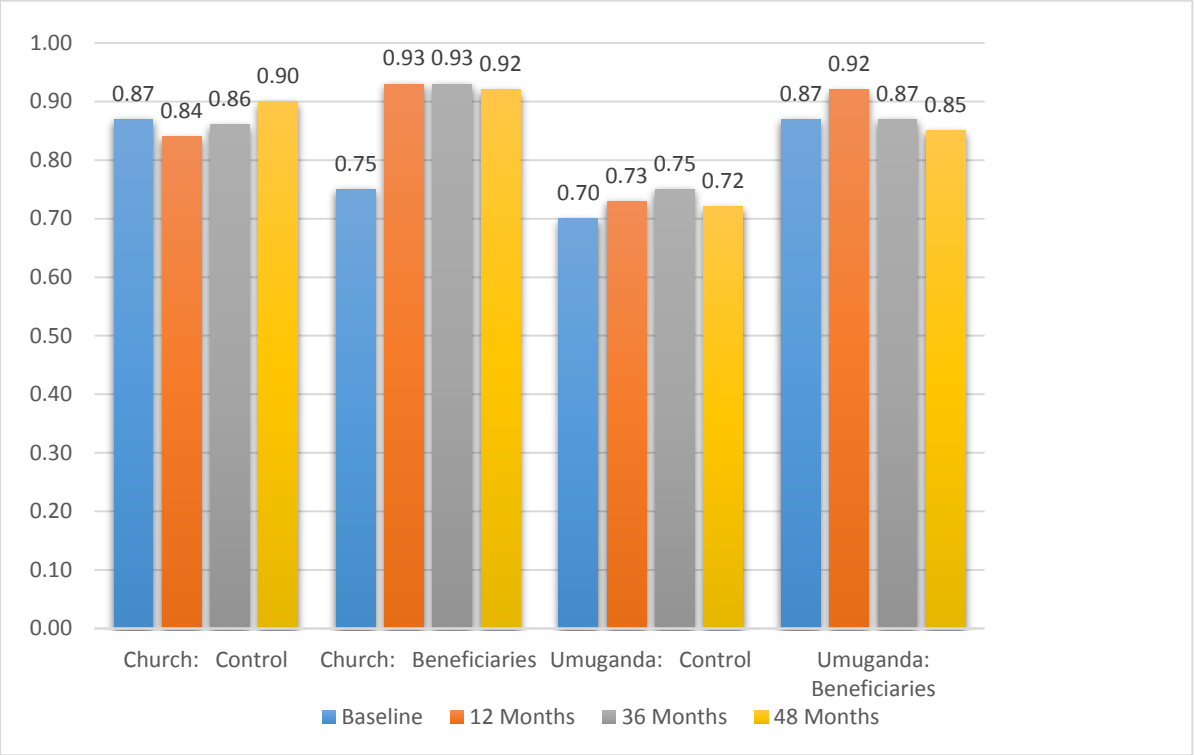
Hypothesis: ***More households that participate in the Graduation Programme will be engaged in social activities over time, in comparison to control group households.***

The surveys collected information on the following four indicators of participation in social and community activities: (1) church attendance – measured as an ordered categorical variable (many times a week, once a week, once in a while, not at all); (2) engagement in community work or *'Umuganda'* (every month, once in a while, never); (3) attendance at women's workshops (every day, once in a while, never); (4) membership of cooperatives (a binary variable – yes or no).

Trends for church attendance (Figure 12) show that the proportion of beneficiaries who attended church at least sometimes increased from 75% during baseline to 93% during the 12 month survey and remained this level for the 30 month and 40 month surveys. For the control group, church attendance has been increasing slightly over time (Table 13). Therefore, we found that over time the intial gap between beneficiaries and control group has narrowed. With respect to *Umuganda*, Figure 12 shows that

participation for beneficiaries started at a higher point during baseline than control group, and has been cyclical for beneficiaries (with a slight increase to 92% after 12 month survey and a reduction back again to 87% during the 36 month survey and to 85% during the 48 month survey). For control group, participation in Umuganda has remained between 70 and 75% during the 48 month period. The gap in participation in *Umuganda* in favour of beneficiaries is declining over time (Table 13).

Figure 12: Trends on church attendance and participation in *umuganda* (%)



With respect to attendance at women's meetings we a slight decline in the proportion of women participating in meetings during the 48 month survey for both control group and beneficiaries (Figure 13). The gap over time between control group and beneficiary women, however, has remained high and in favour of beneficiary women (Table 13). Finally, with respect to membership of cooperatives, the large increase in the proportion of beneficiaries who are members of cooperatives recorded in the 12 month survey remained unchanged for the 30 month survey, but also declined for the 48 month survey. For control group households, the situation has been cyclical too, with cooperative membership declining from 26% during baseline to 18% during the 12 month survey and then increasing to 32% during the 30 month survey, then declining to 28% during the 48 month survey. Cooperative membership shows a sustained improvement over time since the gap found at 12 months remains after 48 months (Table 13).

Figure 13: Trends for attending women's meeting and membership of cooperatives (%)

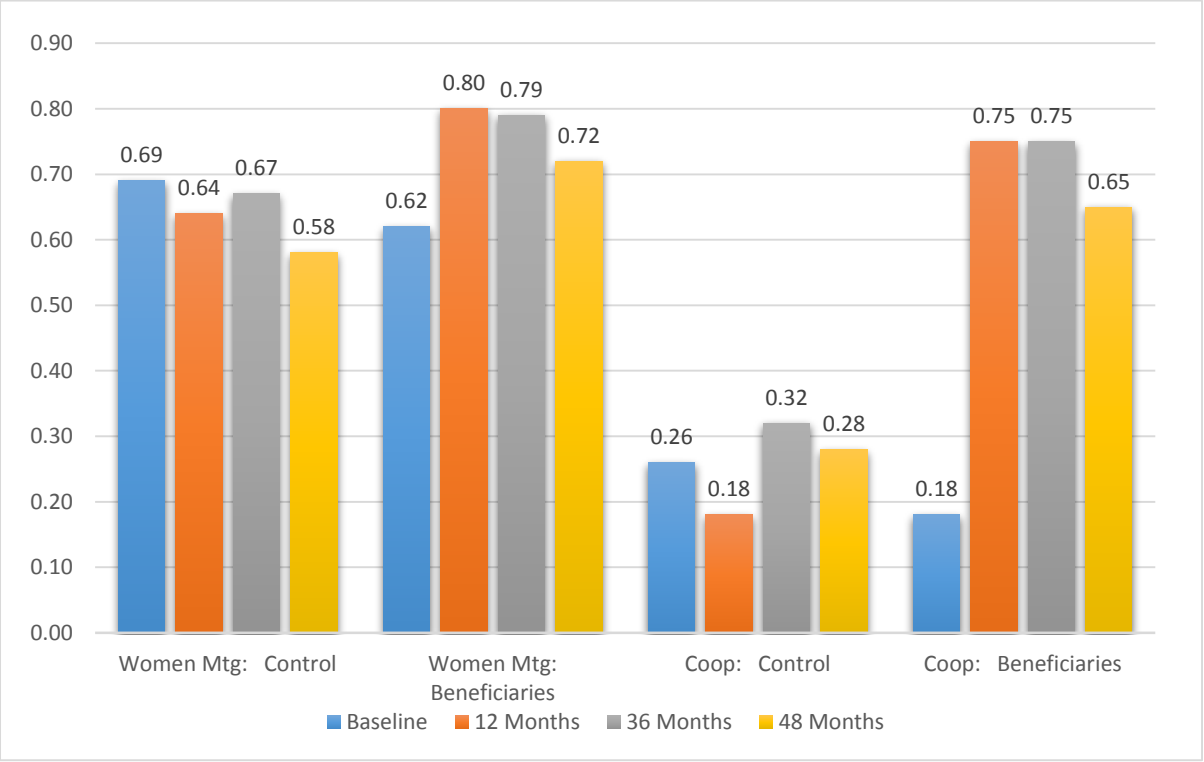


Table 13: Trend analysis for engagement in social activities (different indicators)

	Baseline	12 Months	36 Months	48 Months	Trend
Church Membership					
Church: Control	0.87	0.84	0.86	0.90	No change
Church: Beneficiaries	0.75	0.93	0.93	0.92	Sustained upwards
	Difference after 48 months relative to 12 months				*Sustained but declining*
Umuganda					
Umuganda: Control	0.70	0.73	0.75	0.72	Cyclical
Umuganda: Beneficiaries	0.87	0.92	0.87	0.85	Cyclical
	Difference after 48 months relative to 12 months				*Sustained but declining*
Attending Women's Meetings					
Women Mtg: Control	0.69	0.64	0.67	0.58	No change
Women Mtg: Beneficiaries	0.62	0.80	0.79	0.72	Cyclical
	Difference after 48 months relative to 12 months				*Sustained*
Members of Cooperatives					
Coop: Control	0.26	0.18	0.32	0.28	Cyclical
Coop: Beneficiaries	0.18	0.75	0.75	0.65	Cyclical
	Difference after 48 months relative to 12 months				*Sustained*

4. Graduation Over Time: Empirical Analysis

This section provides results from trajectories of graduation thresholds over time for beneficiaries and control group households. In order to maintain consistency with our previous analyses, we use the same three key outcomes which were previously analysed in terms of enables and constrainers of sustained changes over time (consolidated report 2014). These outcomes are the poverty index, the production asset index and the consumption asset index.

The first part of the analysis will identify trajectories of graduation over time, and for this analysis the selection of graduation thresholds is important. Then, households will be classified into each of the categories of trajectories of graduation described in Table 2, which are (i) sustained change over time, (ii) late improvement, (iii) decline over time and (iv) no change over time. For the final part of the analysis a multinomial logistic regression is employed to estimate the likelihood that households (beneficiaries and control group separately) fall into each of the categories for trajectories of graduation. Due to the complexity of the multinomial logit model in the interpretation of results we undertake the empirical analysis separately for beneficiaries and control group. Among the key factors that will be included in the analysis we have gender of the head of the household, more than two adults living in the household, household size, land ownership and land size, dwelling ownership, use of improved seeds and cooperative membership, additional support from outside the home (remittances and access to credit), and human capital of the main respondent. These are the same factors used in the consolidated report for Cohort 1 in 2014, for which 3 rounds of the graduation survey were employed.

4.1. Trajectories of graduation thresholds over time

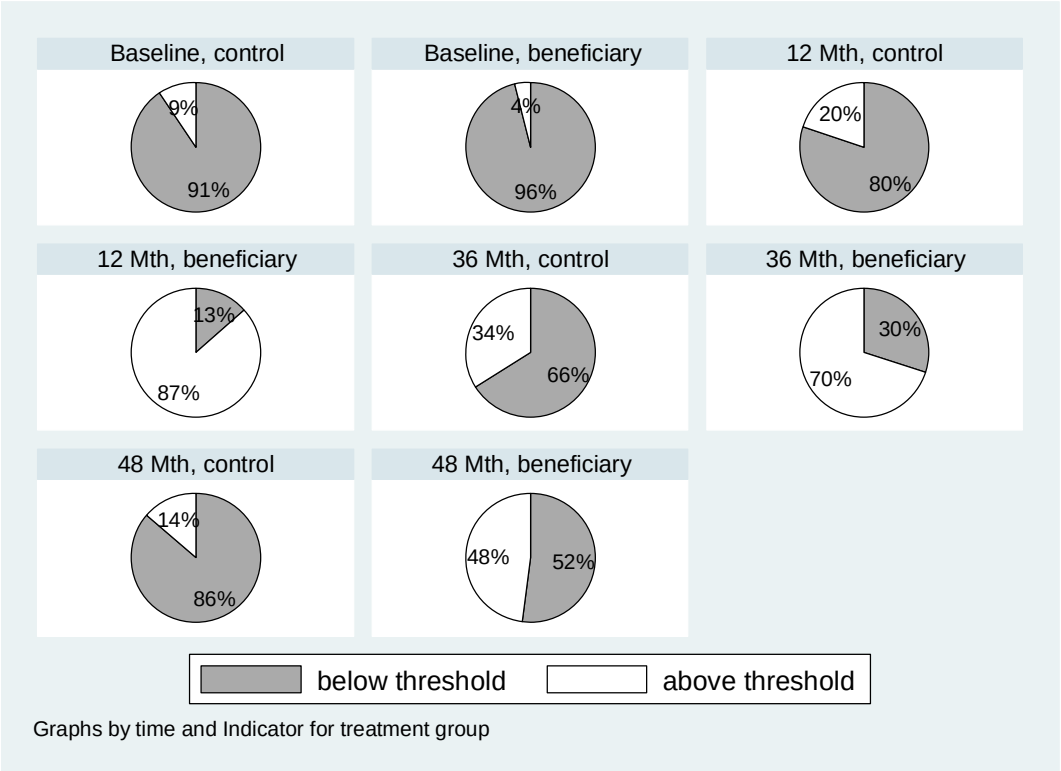
The first part of the empirical analysis consists on the identification of thresholds over time for the key outcome indicators: lack of deprivation index, productive asset index, and consumption asset index. For each of these indicators a ‘subjective’ threshold is established based on the distribution over time of the proportion of households, beneficiaries and control group, below and above the threshold. The aim of this analysis is to avoid using extreme cases, whereby none or all of the individuals in a particular group below to a particular graduation threshold.

The first indicator is the lack of deprivation index which combines number of meals per day, ability to afford to pay for membership of the government subsidised Mutual Health Insurance Scheme, and their ability to purchase medicines. The scale ranges from 0 (only eats a few times a week, can never afford health care or essential medicines), to 9 (eats three times a day, can always afford health care and basic medicines). A threshold was selected at 5, as this will imply that households with a

threshold of 5 can have at least two of these indicators since each of these indicators has a maximum value of 3 for the index. For example and individual eating three meals per day (value for the index of 3) and at least afford medicines sometimes (value for the index of 1), will be above the threshold. This threshold was also selected due to the low proportion of households who recorded being above the threshold during baseline.

Figure 14 the proportion of beneficiaries and control group households falling below the threshold during the 4 time periods. During baseline only 4% and 9% of beneficiaries and control group households were above the threshold, respectively, which is important for the analysis. Right after the end of the cash transfer, 87% of beneficiaries were above the threshold and only 20% of control group did. The situation has declined for beneficiaries, since 70% and 48% were above the threshold during the 36 and 48 months surveys. Control group households also followed a cyclical pattern, increasing in the proportion of households above the threshold by the 36 month survey and then declining after the 48 month survey.

Figure 14: Thresholds for lack of deprivation index (below 4 in the value of the indicator) over time by treatment (%)

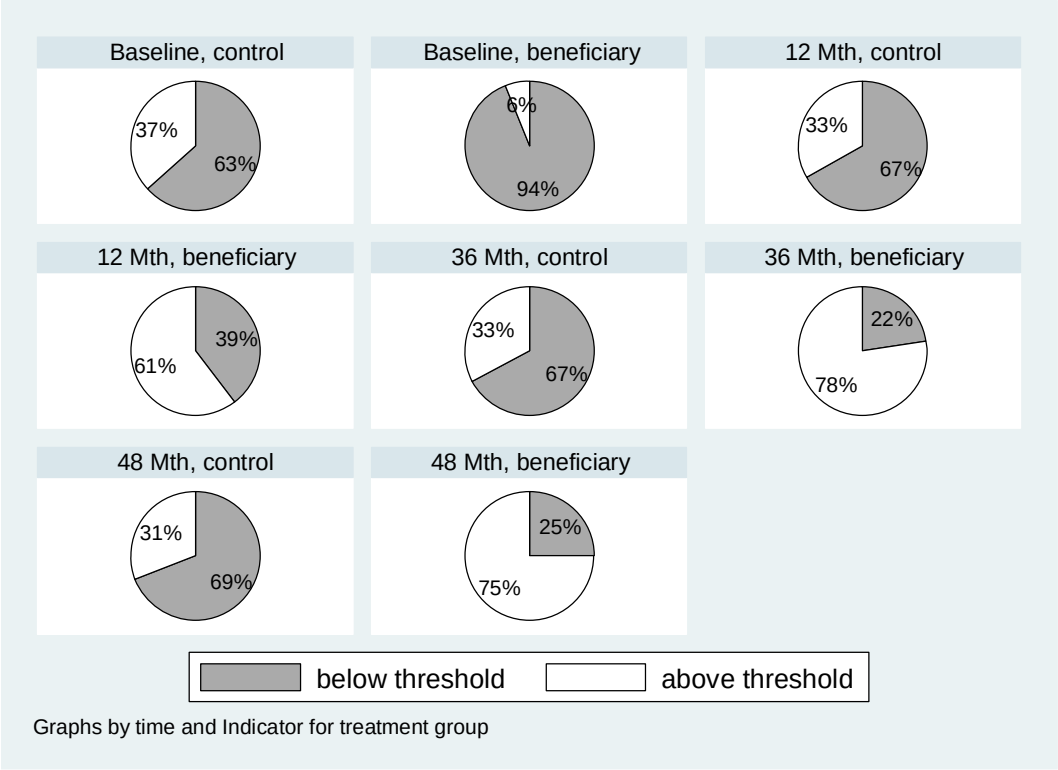


The second composite outcome is the productive asset index. The index combined with the same weight for the 8 different productive assets owned by households (lives on own land; land is used for agriculture; amount of land used for agriculture; uses improved seed; owns a bicycle; owns a cow; owns other animals; owns at least one

hoe). The combined measure has a minimum value of 0 meaning no ownership of any of the above productive assets and 8 indicates at least 1 of each of these assets. A threshold for the ownership of at least 4 of these assets was established, mainly due to the low proportion of beneficiary households who owned at least 4 of these assets during baseline.

Figure 15 shows the proportion of beneficiaries and control group households falling below and above the threshold for productive assets. During baseline only 6% of beneficiaries were above the threshold, but this increased to 61% after 12 months, 78% after 36 months and 75% after 48 months. For control group households the situation of asset accumulation is more stable over time.

Figure 15: Thresholds for productive asset index (below 4 assets) over time by treatment (%)

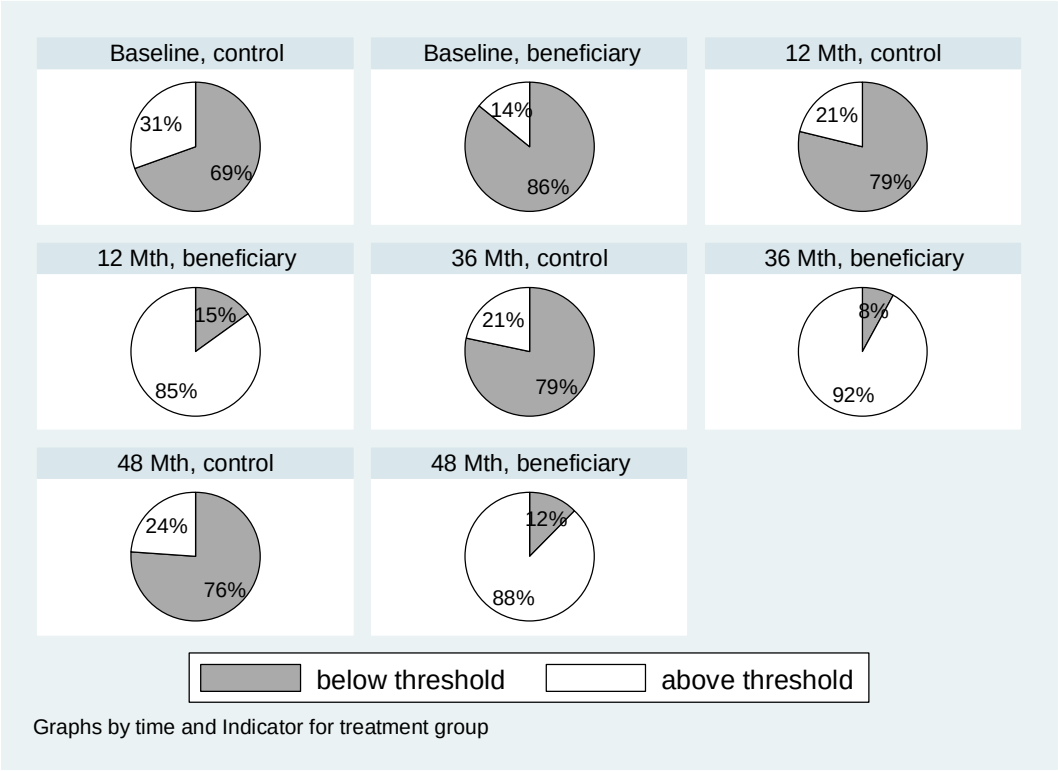


The third composite index is consumption assets, which includes the sum of the following assets owned by households: house, saucepan, spoon or fork, plate, basin, jerry-can, chair, radio, mobile phone. There is no weight given to the index so each item adds the same value to the index, which ranges from 0 indicating extremely asset poor to 9 (indicating ownership of at least one or some of each of these assets.

A threshold was established at the ownership of at least 6 of these assets, to be considered above the threshold. During baseline, only 14% of beneficiaries had 6 of these assets, and 31% of control group. Over time, the proportion of beneficiaries who passed the threshold increased to 85% during the 12 month survey, 92% during

the 36 month survey and 88% during the 48 month survey (Figure16). For control group households, although 31% started above the threshold during baseline, actually a fewer proportion of households were above the threshold over time.

Figure 16: Thresholds for consumption asset index (below 6 assets) over time by treatment (%)



4.2. Classification of graduation thresholds over time

The next step in the analysis is to classify households according to whether they showed a sustained trajectory over the graduation threshold over time, whether the start of the trajectory was late, meaning at the 36 or 48 months surveys; whether a potential increased showed right after the end of the cash transfer has reversed back to the original position and the household is below the graduation threshold or whether there were no changes over time.

Table 14 shows results of the classification of households according to trajectories of graduation thresholds over time. According to lack of deprivation, only 4% of control group maintained a sustained improvement whereas 41% of beneficiaries did. In terms of late increase, 10% of control group households and 9% of beneficiaries showed a late improvement. A substantial proportion of control group and beneficiaries were classified as declining, meaning that by the 12 month survey they had already

passed the threshold but fell below the threshold during the 36 or 48 months surveys. Finally, nearly half of control group households remained below the threshold, and only 4% of beneficiaries did.

Table 14: Classification of households according to trajectories of graduation threshold over time (different outcome indicators)

	Lack of Deprivation Index		Productive Asset Index		Consumption Asset Index	
	Control	Beneficiaries	Control	Beneficiaries	Control	Beneficiaries
	%	%	%	%	%	%
Sustained	4.15	40.51	19.17	48.61	9.84	75.44
Late increase	10.36	8.61	12.44	25.57	12.95	11.9
Declined	35.75	46.84	26.94	15.44	18.65	8.86
No change	49.74	4.05	41.45	10.38	58.55	3.8

Source: Impact Evaluation Data - Concern Worldwide Rwanda

For productive assets, nearly half of beneficiaries were classified as sustaining their position over the threshold of 4 assets and only 19% of control group did. Another 26% of beneficiaries were considered late increase, showing an accumulation of assets above the threshold after the 36 or 48 months survey (but not during the 12 month survey) and only 12% of control group households did. Most control group households were classified as no change or declining over time according to this index (68%).

Finally, according to consumption assets, nearly three-quarters of beneficiaries maintained their position above the threshold of ownership of at least 6 consumption assets and a further 12% managed to cross the threshold late. Only 3.8% of beneficiaries showed no change remaining below the threshold over time. The situation for control group households is the opposite, with 59% being classified as always below the threshold of consumption assets and a further 19% showing a declining position over time, falling under the threshold below 6 assets.

4.3. Multinomial logit: factors associated with classification of graduation thresholds over time

Once we have classified households according to the four different graduation thresholds over time (sustained improvement, late increase, declined improvement or no change) the next stage in our analysis is to identify the factors that are associated with the likelihood that households are classified into each of these graduation thresholds. Gender of the head of the household, labour capacity, literacy of the head of the household, initial assets, external support from remittances or access to institutions such as cooperatives are factors measured during baseline which may determine the likelihood that households belong to the graduation thresholds over time.

Given that we have four distinct groups, the empirical analysis is based on a multinomial logit model. The multinomial logit model works as a series of independent logit models. The simple logit model measures the probability that the household belong to a certain group, for instance the household achieving sustained improvement. Since the multinomial logit model uses independent single logit models it is important to define a reference group. In our case, the comparison is not only whether households achieved sustained improvement, but also whether they had a late increase, a decline over time or no change. For the analysis, a reference group has to be selected so that all results are in relative terms.

Selecting a comparison group is somehow arbitrary. It depends mainly on the presentation of results. For this report we are interested in comparing those households who are having a sustained changed, a late increase or a decline over time, so we use those households who showed no change as a comparison group. Apart from the selection of comparison group, we estimate separate models for beneficiaries and for control group households. We know that beneficiaries are more likely to show a sustained increase over time, this has been shown previously by simply looking at the proportion of beneficiaries who are having a sustained improvement relative to control group households. But this is not the key aspect of the research. We are interested to know if there were factors which make the household more resilient and thus increase their ability to have a sustained change.

The multinomial logit model works as follows. Using our reference category, in this case beneficiaries who had not change in the outcome over time, it measures whether the inclusion of a factor, for example labour capacity, increases or decreases the likelihood of beneficiaries being in each of the other categories. To exemplify, we assume that labour capacity increases the likelihood to have sustained improvement on the outcome and less likely to have a late increase on the outcome and no difference with respect to showing a decline in the outcome. Therefore, we report:

- Relative to beneficiaries who had no change in the outcome, those with labour captaincy are more likely to have a sustained improvement.
- Relative to beneficiaries who had no change in the outcome, those with labour capacity are less likely to show a late increase in the outcome
- Relative to beneficiaries who had no change in the outcome, labour capacity is not determinant of showing a decline in the outcome over time.

The fact that for every variable and for every outcome there are at least 3 relative results makes the presentation of findings from the multinomial logit model challenging. In addition, we have separate results for beneficiaries and for control group households. In order to make the results more accessible, we present results in a single table and only for the factors that are associated with positive or negative changes. Results are reported separately for beneficiaries and for control group.

Table 15 shows the empirical results for beneficiaries and Table 16 for control group households. Results are presented for each of the factors investigated.

Gender of the head of the household: We found that male and female headed households, from both beneficiaries and control group, were as likely to belong to each of the categories of graduation thresholds over time. Therefore, gender of the household is not a determinant of graduation thresholds over time.

Home Ownership: Home ownership has previously been shown to be important determinant of sustained reductions in deprivation among beneficiaries. Our results show that beneficiaries who owned their dwelling at the beginning of the programme are more likely to be classified as having sustained improvements in productive assets and consumption assets relative to beneficiaries who were classified as having no change in these assets. For control group households, ownership of dwelling is also associated with improvement in outcomes over time for the control group. Relative to control group households who were classified as having no change, those who owned their dwelling in baseline were more likely to be classified as having sustained reductions in deprivation and late reductions in deprivation. In terms of productive assets, control group households who own their dwelling were less likely to be classified as those having a decline over time in productive assets relative to those classified as having no change. As for consumption assets, control group households who own their dwelling were less likely to be classified as having a late improvement in consumption assets relative to those classified as having no change. Overall we find that ownership of dwelling is an important aspect of sustained improvements over time.

Table 15: Multinomial logit results for trajectories of graduation threshold over time for beneficiaries (different outcome indicators)

Reference category: No Change	Lack deprivation	Productive Assets	Consumption assets
Female headed household	--	--	--
Own a house	--	More likely to sustain above threshold	More likely to sustain above threshold
Labour capacity	--	Less likely to show decline	Less likely to show decline
			Less likely to cross threshold late
Registered land	--	Less likely to show decline	More likely to sustain above threshold
Large plot of land	--	--	--
Increase support from outside	--	--	More likely to sustain above threshold
Cooperative membership	--	--	More likely to sustain above threshold
Household size	--	Less likely to show decline	Less likely to show decline
			More likely to sustain above threshold
Literacy of individual	More likely to sustain above threshold	--	More likely to sustain above threshold
	More likely to cross the threshold late		More likely to cross the threshold late

Labour Capacity of the Household: Labour capacity was explored as an enabler of graduation. Unfortunately, the survey did not allow differentiating between adults with and without labour capacity. Our approximation is therefore to differentiate between households with only one adult from households with two or more adults. Our previous results showed that beneficiaries with two or more adults living in the household do much better than beneficiaries with only one adult in the household in terms of the accumulation of productive assets over time. Our current results on the association between labour capacity and likelihood of being classified into a sustained improvement in outcomes over time show that beneficiaries with two adults in the household were less likely to be classified as showing a decline over time in productive and consumption assets relative to beneficiaries who showed no change. Similarly, beneficiaries who had two adults in the household were less likely to be classified as showing a late increase in consumption assets relative to beneficiaries who showed no change. For control group households, having two adults in the household was associated with reduced likelihood of being classified as showing a decline over time in lack of deprivation and productive asset accumulation and more likely to be classified as having a sustain improvement in consumption assets relative to control group household who were classified as having no change over time in these indicators.

Land Tenure Status: We have previously investigated initial land tenure status as a potential enabler of sustainable growth in outcomes for beneficiaries over time. Tenure security in the analysis is proxied by having registered land. We have previously found that land tenure could be a potential enabler of sustained reductions in deprivation over time for beneficiaries. Our analysis here suggests additional benefits in terms of beneficiary households who own their land being classified less likely to have decline in productive assets and more likely to be classified as having sustained changes in consumption assets relative to being classified as having no changes in these outcomes. For control group households, those who owned their land were more likely to be classified as having sustained reductions in deprivation (on time and late), sustained improvements in productive assets and less likely to be classified as having decline in productive assets relative to control group households who were classified as having no change in these outcomes.

Table 16: Multinomial logit results for trajectories of graduation threshold over time for control group (different outcome indicators)

Reference category: No Change	Lack deprivation	Productive Assets	Consumption assets
Female headed household	--	--	--
Own a house	More likely to sustain above threshold	Less likely to show decline	Less likely to cross threshold late
	More likely to cross the threshold late		
Labour capacity	Less likely to show decline	Less likely to show decline	More likely to sustain above threshold
Registered land	More likely to sustain above threshold	Less likely to show decline	--
	More likely to cross the threshold late	More likely to sustain above threshold	
Large plot of land	--	More likely to sustain above threshold	--
Increase support from outside	--	--	--
Cooperative membership	Less likely to show decline	--	--
Household size	More likely to show decline	--	--
Literacy of individual	Less likely to show decline	--	Less likely to show decline

Size of the Plot: The size of a households plot was explored to assess its impact on the classification of graduation thresholds over time. The results for households with plots larger than 1/8 of hectare or more (at baseline) were compared to those with less than 1/8 of hectare. Previously we found some counterintuitive results in terms of the size of the plot having a negative association with lack of deprivation for beneficiaries. Our current results do not show size of the plot as a significant determinant of the likelihood of being classified into different graduation thresholds over time for beneficiaries. We do find that for control group, those with larger land holdings were more likely to be classified as having sustained improvements in productive assets over time relative to being classified as showing no change in this outcome. Evidence for graduation thresholds in favour of the size of the plot is not as robust as seems to be for land tenure.

Outside Support: We have previously investigated whether additional support, for instance receiving remittances, serves as an enabler of sustained growth in outcomes over time. We found that indeed those beneficiaries who were also receiving outside support were more likely to show sustained improvements. We had to recode the indicator and use it as increase support from outside of the house over time, since there were only 4% of beneficiaries and control group households who reported receiving support from outside of the household during baseline. Our results confirm

that beneficiaries who received increased support from outside of the house were more likely to be classified as having sustained improvements in consumption assets relative to beneficiary households who showed no change in this outcome. For control group households, receiving increased support from outside of the house was not a factor associated with the classification of graduation thresholds over time.

Membership of a Cooperative: Our previous results showed that beneficiary household members of cooperatives benefitted more in terms of productive assets than beneficiary households who were not members of cooperatives. Our current results highlight the importance of cooperative membership for showing sustained improvements in consumption assets relative to no change for beneficiaries. For control group households, we found that being a member of a cooperative was associated with a lower likelihood to be classified as having a decline in lack of deprivation over time relative to showing no change. Overall results continue to point to the importance of cooperative membership for sustain improvements over time for beneficiaries.

Size of the Household: We had assessed whether larger households face issues with sustainable graduation over time. There is a link between household size and labour capacity which is important to keep in mind since it is possible that part of the result obtained for household size is indeed labour capacity. Overall, our current results point also to the importance of household size. Larger beneficiary households were less likely to be classified as showing a decline in productive assets and consumption assets and indeed more likely to be classified as showing sustained improvement in consumption assets relative to beneficiary households who showed no change in these outcomes. For control group households, we found that larger households were associated with a higher likelihood to be classified as having a decline in lack of deprivation over time relative to showing no change. Overall, we suggest that household size could perhaps be distorted in terms of its association with sustained improvements over time. It is possible that larger households have more assets, but not more per-capita assets, which is problematic. It is possible that larger households have more labour capacity, but higher dependency ratio.

Human Capital: Finally, we investigated whether human capital in the household is a potential enabler of sustained change over time. We do not have a perfect measure of human capital, so we considered the literacy level of the main respondent to the survey (reading and writing). Previous results did not show that the ability to read or write was associated with sustained changes over time. In the current analysis we found that beneficiaries who were able to read or write at the beginning of the programme are more likely to be classified as having sustained improvements in lack of deprivation, sustained improvements in consumption assets, as well as being classified as crossing the threshold line late with these two outcome indicators relative to beneficiaries who showed no change. For control group households, literacy was associated with reduced likelihood of being classified as having a decline over time

with respect to lack of deprivation and consumption assets relative to control group households classified as having no change in these outcomes.

5. Conclusion

This report provides the results of the research on the long term benefits of the programme Enhancing the Productive Capacity of Extremely Poor People in Rwanda using the first cohort of beneficiaries. In general we find that a substantial proportion of households have benefitted from the programme. In previous reports we have indicated that beneficiaries have:

- Improved their economic and social situation right after the end of the cash transfer as a result of the programme support, both monetary and training.
- The set up of the programme does not enable us to differentiate between the impact of cash from that of training, so the results of programme support must be taken holistically.
- 18 months after the end of the cash transfer, we asses trajectories of the outcome indicators and started to established some key enablers of graduation. Among the key enablers of graduation we found land tenure, labour capacity, receiving additional support from outside of the home, and cooperative membership as important for supporting beneficiaries over time.
- 30 months after the end of the cash transfer, we continued to assess the trajectories followed by beneficiaries and control group households in terms of their outcomes. In some areas, there were some reductions in the value of the indicator, and this reduction was the same for beneficiaries and control group households. When this is the case, it is likely that a more general economic or social downturn is affecting the region. The positive side of this analysis is that beneficiaries in most indicators have managed to maintain a position of advantage relative to control group households.
- In the classification of households according to graduation thresholds over time, we continue to find labour capacity, receiving additional support from outside of the home, and cooperative membership as key determinants of whether households are classified as showing a sustained change.
- Gender of the head of the household has not shown to be a key differential in programme benefits.

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