



Impact assessment of CARE's Financial inclusion interventions in Rwanda's Southern Province

Endline report

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EXECUTIVE SUMMARY

The Promoting Opportunities for Women's Economic Empowerment in Rural Africa (POWER Africa) initiative, funded by the Mastercard Foundation and implemented by CARE Canada, aims to improve financial inclusion in Burundi, Côte d'Ivoire, Ethiopia and Rwanda by linking VSLAs with formal financial institutions. Promoting opportunities for Financial Inclusion in Rwanda (PROFIR), as the project is called in Rwanda, aims to facilitate the access of 180 000 people to formal financial services through linkages to various Financial Service Providers. The PROFIR project began in November 2013 and continued till December 2017.

CARE Canada engaged Genesis Analytics, RWI and ikapadata, to conduct an impact evaluation of PROFIR to determine the benefits at the household level that VSLA clients gain from training on financial literacy and linkages with formal financial institutions. As there was no obvious comparable control group, and available associated sampling frame, CARE Rwanda agreed to withhold PROFIR from a randomly selected number of VSLAs in the Southern Province. However, the manner in which the programme rolled out led to the random assignment being abandoned. Moreover, during the gap between baseline and endline surveys, PROFIR was pulled from the Southern Province and replaced by another programme, the NORAD funded Gender Equality and Women's Empowerment Project (GEWEP). Data were collected under the belief that these two programmes were comparable; however, material differences between the programmes were revealed after the completion of the data collection. Thus, the evaluation looks at the efficacy of the financial literacy component, as the content was the same for the two programmes. However, the above point adds a significant limitation to the study: we cannot comment on the overall impact of PROFIR. Given the above considerations, we recommend that the findings and conclusions of this report are not used to make significant decisions around the design or implementation of PROFIR in its entirety.

The evaluation has not found evidence to suggest that the financial inclusion interventions in the Southern Province have driven greater linkages between the formal financial sector and VSLA in terms of groups having accounts with formal institutions. This could be a result of the almost ubiquitous access to SACCOs in Rwanda or CARE Rwanda's assertion that the replacement programme that usurped PROFIR in the Southern Province did not have a great focus on the financial inclusion component. Furthermore, we cannot find evidence to suggest that financial inclusion programmes have led to a greater number of VSLA opening group savings accounts or taking out loans from formal financial institutions. However, we have found that the financial inclusion interventions have driven VSLA to take out larger amounts of credit on average from formal financial institutions. The impact of the financial literacy training and the larger amounts of credit are ambiguous on the financial behaviour and VSLA households. In particular, there are differences in the impact depending on the age of the beneficiary. However, certain impacts are consistent, particularly, households seem to be taking out less loans, and individuals are more risk averse and patient as a result of the financial inclusion programmes. We find that the financial inclusion programmes have had a positive impact on food security, in that the number of days that households have gone hungry in the past six months has decreased. In terms of empowerment, for the individual, we find that the programmes implemented in the Southern Province have resulted in beneficiaries reporting that they are less included in household decision making and have a reduced level of perceived life satisfaction, which could be a result of individuals becoming more self-aware and aware of power dynamics in their households. This is not necessarily a negative finding, and may instead illustrate the beginning stages of empowerment, as people are becoming more aware and critical of their situations.

Thus, overall the evaluation has found modest impacts across the outcomes of interest and has brought to light some interesting results around intra-household decision making and power that require further interrogation.

INTRODUCTION

CARE International is one of the world's leading non-governmental relief and international development organisations and is currently the leading organisation in the promotion of Village Savings and Loan Associations (VSLAs) in Africa, reaching more than 3.5 million people in 26 countries.

The Promoting Opportunities for Women's Economic Empowerment in Rural Africa (POWER Africa) initiative, funded by the Mastercard Foundation and implemented by CARE Canada, aims to improve financial inclusion in Burundi, Côte d'Ivoire, Ethiopia and Rwanda by linking VSLAs with formal financial institutions. Promoting opportunities for Financial Inclusion in Rwanda (PROFIR), as the project is called in Rwanda, aims to facilitate the access of 180 000 people to formal financial services through linkages to various Financial Service Providers (FSPs), including Saving and Credit Cooperative (SACCOs), microfinance institutions (MFIs), mobile network operators (MNOs) and banks with mobile technology and agency banking. In Rwanda, CARE has targeted poor, financially excluded adults (>18 years) in rural and peri-urban areas, with a particular focus on women and specifically the abject poor, the very poor and the poor.

The PROFIR project began in November 2013 and continued till December 2017. CARE Canada engaged Genesis Analytics, RWI and ikapadata, to conduct an impact evaluation of PROFIR, the objective of which is to determine the benefits at the household level that VSLA clients gain from training on financial literacy and linkages with formal financial institutions, and to understand the extent to which those benefits can be attributed to the PROFIR project.

In this endline report, we present findings from the impact evaluation of PROFIR. The report culminates in conclusions and recommendations to consider for similar programmes in future.

BACKGROUND AND CONTEXT

Financial inclusion is an important component in harnessing further development in Rwanda. Rwanda aims to reach 80% financial inclusion by 2017, a target *that has already been achieved*, and to 90% by 2020.¹ To achieve this target, the Government began a financial sector reform in 2008 called the Financial Sector Development Programme (FSDP), which aimed to “develop a stable and sound financial sector that is sufficiently deep and broad, capable of efficiently mobilising and allocating resources to address the development needs of the economy and reduce poverty.”² This programme appears to have been remarkably successful, with FinScope Rwanda's 2012 survey revealing an increase in financial inclusion from 47% to 72%, and FinScope Rwanda's 2016 survey showing further progress to 89%.

Following the success of the FSDP, the government launched FSDP II in 2012, with a focus on the soundness and stability of the financial sector. One of the key focus areas highlighted in FSDP II is the financial inclusion programme. In Rwanda, access and eligibility of financial services are no longer perceived as barriers to financial inclusion; however, quality, understanding, uptake and continued use of financial services remain a significant concern. In particular, use of credit is a specific area of concern, given that 28% of adults do not borrow, and 61% rely on informal mechanisms such as money-lenders, which are often associated with extortionate rates and abusive consumer practices. Only 15% of adult Rwandans access credit through regulated formal lenders.³

¹ Xavier Martin, Rwanda: A country finding its path to financial inclusion, 2014

² National Bank of Rwanda, Financial Sector Development Program, 2008

³ FinScope 2016 Rwanda

VSLAs usually serve a segment of the market, the extremely poor population, that are not traditionally reached by formal means. In Rwanda, a typical VSLA consists of 15 to 30 people and is gender-mixed with the majority of members be women. VSLA members meet once a week to contribute to or to borrow from a shared fund. Eight to twelve months after the savings circle has started, each member will receive her share-out of the fund and her accumulated savings. See Karlan et al. (2017)⁴ for a detailed description of the VSLA model.

VSLAs are often viewed as a means to not only provide access for the poorest households to valuable financial services, but to provide a pathway for formal financial inclusion. VSLAs provide access to a safe, convenient place to save and small timely loans, thus building the financial skills and assets of members. VSLAs also provide their members with practical financial experience that they can leverage to successfully engage with formal financial service providers (FSPs). Equipped with financial literacy to ensure that members understand the way that formal financial markets work, pilots linking VSLAs with FSPs have resulted in increased financial access for VSLA participants and high repayment rates for the banks.⁵

PROFIR

Against this background, CARE Canada launched the PROFIR project with the objective of alleviating the challenge of linking the poorest of Rwanda's population to formal financial institutions. This challenge is complex as there are multiple barriers to poor people becoming financially included, namely:

- Lack of financial understanding or information between providers and consumers;
- Gender and age discrimination;
- Poor people's low income, erratic cash flow, low resilience to shock expenditure, and financial short comings and problems;
- Lack of suitable products and processes from formal financial service providers that cater to the needs of poor people (usually due to the lack of a proven business case for reaching the poorest people given the expectations of their shareholders and the need for sufficient profit margins);
- Geographic distances and high transaction costs for banks to operate in remote locations; and,
- High transport and opportunity costs for people to bank with formal financial institutions.⁶

To address these challenges, PROFIR includes two key components, the combination of which is assessed as part of this impact evaluation:

- Financial literacy training and sensitisation to linkages delivered through Village Agents (Village Agents are local VSLA members, who facilitate and train VSLAs in their community and neighbouring areas, and work on a fee for service basis) to 300 000 VSLA members. The financial literacy training is made up of seven modules; and
- Based on an assumption that 60%⁷ of those VSLAs that receive training will link to FSPs, there is a target of 180 000 VSLA members to be linked to formal FSPs (through their groups) by the end of the programme.

The PROFIR theory of change (TOC) begins as a two-pronged approach with CARE forming partnerships with FSPs and CARE providing financial literacy training to Village Agents (VAs):

⁴ Karlan, D., Savonitto, B., Thuysbaert, B., & Udry, C. (2017). Impact of savings groups on the lives of the poor. *Proceedings of the National Academy of Sciences*, 201611520.

⁵ CARE Canada's proposal to the Mastercard Foundation, 2013

⁶ Village Savings and Loans: A Pathway to Financial Inclusion for Africa's Poorest Households, CARE USA, 2011

⁷ CARE Canada's proposal to the Mastercard Foundation, 2013

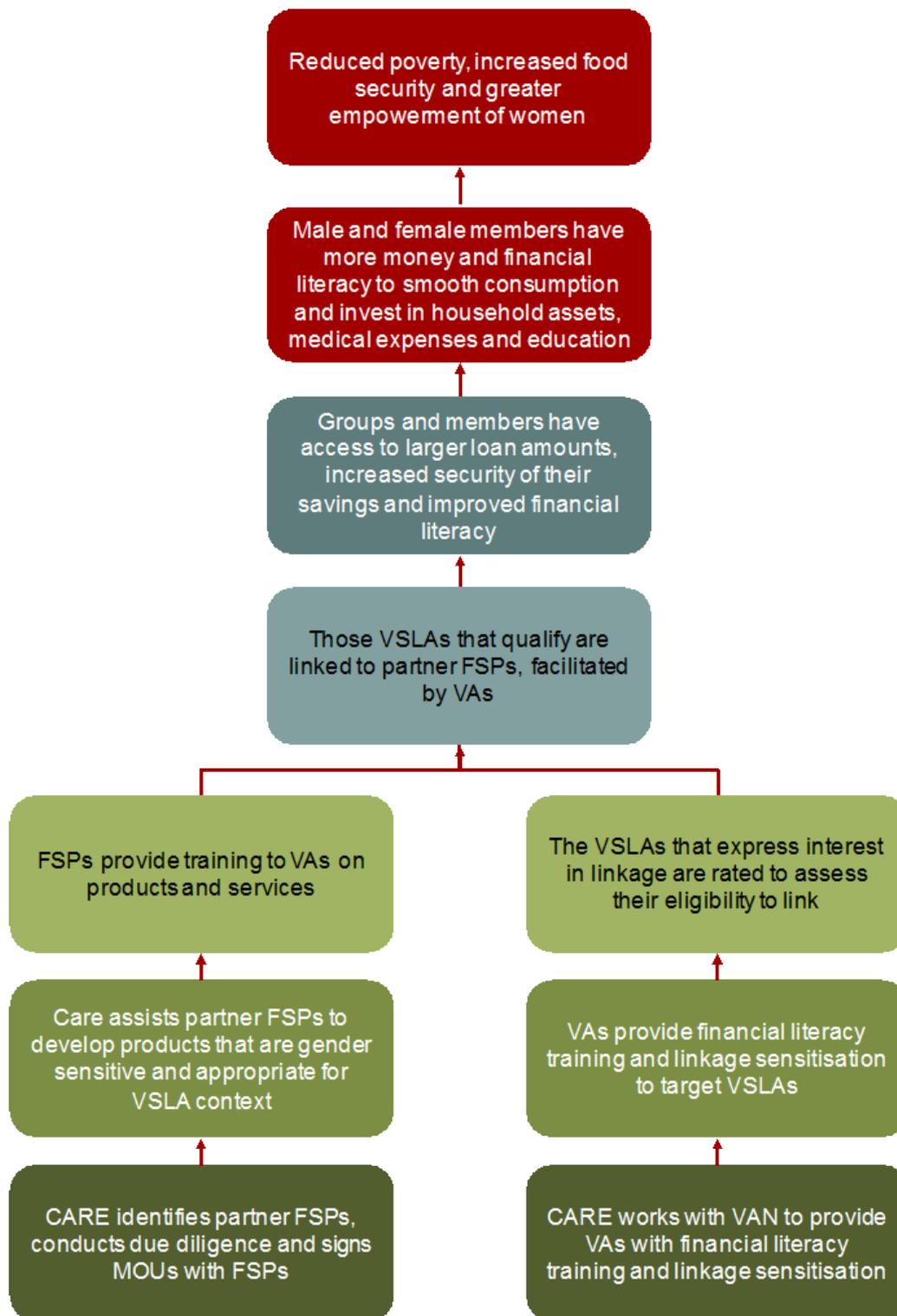
- The first step in this process is that CARE conducts research on the linkage ecosystem in Rwanda. This process helps CARE to identify new partner FSPs, propose new products to FSPs and further develop the linkages strategy. Once CARE has chosen to partner with an FSP and has conducted a due diligence, an MOU is signed with them. CARE then assists the FSPs to develop gender sensitive and appropriate products and services for the VSLA context.
- CARE also formed a Village Agent Network in 24 of Rwanda's 30 districts. The VAs in this network were trained in the financial literacy content and financial linkages, and were then trained to target VSLAs that had completed at least one savings cycle, in a cascade training approach. A savings cycle is a 12-month period, whereby VSLA members purchased shares (save), borrowed money and repaid loans each month; at the end of the 12 months the total amount saved plus any interest accrued from the loans is shared out to the members based the number of shares they purchased.

Once a group had completed the financial literacy and linkages training, some groups were expected to express an interest to link to a formal FSP of their choice. These groups were to be assessed by their VA using a standardised rating tool that examines a number of quantitative and qualitative indicators, such as attendance rates, savings rates, loan activity and repayment. The group was to be given a score out of 100, based on performance against these indicators. A group's score was to indicate whether it was eligible to link to an FSP, and whether the link was only for savings. If the group was also approved to access credit, the score indicated the amount of credit the group was allowed to access. If a VSLA qualified and expressed an interest to link, the linkage of the group was facilitated by the VA and selected FSP. It is important to note that some groups may have received the training and met the assessment criteria but did not choose to link.

The intention is that the linkage would provide groups, and thus group members, with access to larger loan amounts and increased security for their savings. Coupled with this increase in access, there was an anticipated improvement in members' financial literacy and ability to make better-informed financial decisions generated through the upfront financial literacy training. As a result of this, male and female members would be better able to smooth their consumption and invest in household assets, income-generating activities, health and education. These factors assist in reducing poverty levels, improving food security and empowering women (thus reducing the gap in household decision making between men and women).

Importantly, outputs that are a direct result of the PROFIR intervention, and thus under its control, include the number of FSPs with which CARE partnered, and the number of VAs trained. Beyond this, the outcomes of the programme, such as the number of linkages established between VSLAs and FSPs, investment in household assets and poverty reduction, are beyond the direct control of the programme, and can be influenced by external factors. For example, CARE has no control over whether a group chooses to not link to an FSP, or whether individuals link to non-partner FSPs independently of PROFIR, or if success of an income-generating activity leads to reduced poverty levels in a particular household. The TOC is graphically depicted in Figure 1 below.

Figure 1: PROFIR theory of change



Agaciro k'umugabane 2004

Itariki	Umubare w'imigabane yazigamwe ku muni w'Inama			
19/12/04	▲	▲	▲	▲
25/12/04	▲	▲	▲	▲
2/12/04	▲	▲	▲	▲
9/12/04	▲	▲	▲	▲
16/12/04	▲	▲	▲	▲
23/12/04	▲	▲	▲	▲
30/12/04	▲	▲	▲	▲
6/1/05	▲	▲	▲	▲
13/1/05	▲	▲	▲	▲
20/1/05	▲	▲	▲	▲
27/1/05	▲	▲	▲	▲

1. Umubare w'imigabane mu ntangiriro	0
2. Umubare w'imigabane yazigamwe mu nama	44
3. Umubare w'imigabane yasubijwe mu nama	0
4. Umubare w'imigabane isigaye	44

Agaciro k'umugabane 2004

Itariki	Umubare w'imigabane yazigamwe ku muni w'Inama			
19/2/05	▲	▲	▲	▲
10/2/05	▲	▲	▲	▲
17/2/05	▲	▲	▲	▲
24/2/05	▲	▲	▲	▲
3/3/05	▲	▲	▲	▲
10/3/05	▲	▲	▲	▲
17/3/05	▲	▲	▲	▲
24/3/05	▲	▲	▲	▲
31/3/05	▲	▲	▲	▲
7/4/05	▲	▲	▲	▲
14/4/05	▲	▲	▲	▲

1. Umubare w'imigabane mu ntangiriro	44
2. Umubare w'imigabane yazigamwe mu nama	44
3. Umubare w'imigabane yasubijwe mu nama	0
4. Umubare w'imigabane isigaye	88

METHODS

EVALUATION DESIGN

The evaluation is a key aspect of PROFIR. While the specific goal of PROFIR was to improve people's lives by encouraging them to link their savings groups to the formal financial sector, a broader goal of the programme was to design an intervention that has great impact and is able to be scaled and replicated in other contexts by various financial sector players.

In spite of this focus on learning, the evaluation team recognised the need for the evaluation to avoid negatively impacting on the programme, but rather, to fit into CARE's 'business-as-usual' rollout as far as possible. Thus, the evaluation was designed to be as unobtrusive as possible without compromising its credibility and statistical validity, the specifics of which are described below.

As there is no obvious comparable control group, and available associated sampling frame, CARE Rwanda agreed to withhold PROFIR from a randomly selected number of VSLAs in the Southern Province. This delay in rollout was expected to reduce the probability of these VSLAs forming linkages with a financial institution within the time between baseline and endline, as well as the associated changes in their outcome indicators. Thus, the VSLAs in this group were to form the 'control group'. The data collected in May and June 2015 from this group and another randomly sampled group that was to be exposed to PROFIR, served as the baseline point against which the endline data was to be compared.

The evaluation focused on the Southern Province of Rwanda, as PROFIR had already begun widescale rollout in the other provinces. At the time of the baseline the Southern Province was the only province where PROFIR had not been rolled out, thus allowing for the identification of a control group.

PROFIR and GEWEP

The initial assignment of the control and treatment groups was random, and those selected to be in the treatment group were to be exposed to the PROFIR programme. However, the manner in which the programme rolled out led to the random assignment being abandoned. Moreover, during the gap between baseline and endline surveys, PROFIR was pulled from the Southern Province and replaced by another programme, the NORAD funded Gender Equality and Women's Empowerment Project (GEWEP).

The evaluators were informed of this change in January 2017 and were initially assured by CARE Rwanda that GEWEP was comparable to PROFIR as it included the same financial literacy modules and that the impact evaluation could continue as is. However, it was communicated after the initial analysis of the endline data in 2018 that GEWEP was in fact different in its approach and focus, and that there was concern around the validity of estimating the impact of PROFIR using beneficiaries of GEWEP. CARE Rwanda asserts that:

- PROFIR focuses on financial inclusion, which is different to GEWEP, which has many other points of focus. This difference in focuses means that more emphasis is placed on the financial inclusion component during PROFIR than GEWEP, and the progression of the GEWEP programme is different to that of PROFIR;
- That GEWEP was rolled out too soon before the end line to be able to establish impact; and,
- That it is not possible to evaluate PROFIR and attribute the changes observed using the data collected, as those surveyed were exposed to GEWEP and not PROFIR.

However, there has been considerable investment in the collection and analysis of the end line data under the understanding that the financial inclusion component of GEWEP and PROFIR were the same. Thus, we still look at the efficacy of the financial literacy content with this data, as the content was the same in the two programmes. However, the above points suggest there is a caveat to and limitation of the study: we cannot comment on the overall impact of PROFIR, as there appear to be material differences between the two programmes.

Control group

In addition to the above, CARE Rwanda moved to a new MIS during the period, which resulted in difficulties in matching VSLA IDs between the baseline and endline. The new MIS works on a different identification system that has not been matched to the VSLA IDs used by the previous system. This made it initially impossible to confidently match the training data provided by CARE Rwanda to the baseline and endline data, as no combination of geographic characteristics uniquely identified every VSLA. Thus, to overcome this issue, IB&C Consulting (a local firm assisting with the evaluation) were contracted to call each of the village agents to establish what modules of PROFIR each VSLA had been trained on. The data from these calls became the treatment indicator for the evaluation. The following table reports the outcomes from this telephonic survey of village agents:

Treatment	# of VSLAs
No training (control)	78
Received PROFIR training	139
Received informal training	9
Unavailable for survey	43
No longer active	14
Total	283

However, after presenting the initial findings from the data using this assignment strategy, CARE Rwanda worked to match the new MIS with the old MIS. CARE Rwanda did this due to their stated concerns around the validity of asking the village agents (the trainers of the financial literacy content) to report on whether they trained the VSLAs or not.

After this matching exercise, it was possible to establish which groups had been trained according to the GEWEP MIS; however, it must be noted that 43 VSLAs could not be matched by CARE Rwanda.

Deviation from assignment

Both methods of establishing which VSLAs received treatment show considerable deviation from the baseline assignment of treatment and control. There is also inconsistency between the two methods. The following tables illustrate these deviations:

		Calls			
		Untrained	Trained	Total	
Assigned	Control	41	61	102	<i>55% correct</i>
	Treatment	37	78	115	
	Total	78	139	217	

		MIS			
		Untrained	Trained	Total	
Assigned	Control	37	72	109	<i>61% correct</i>
	Treatment	17	100	117	
	Total	54	172	226	

		Calls			
		Untrained	Trained	Total	
MIS	Untrained	25	29	54	<i>62% matched</i>
	Trained	53	110	163	
	Total	78	139	217	

Validity of control groups

There is no apparent incentive for village agents to misreport who they trained or did not train, thus, the assignment based on calling the village agents is plausible. The assignment based on matching across MIS systems is also plausible, though it is unclear why this could not have been shared earlier. However, given that the GEWEP MIS is only updated quarterly and that the endline survey was completed in June, there is potential for the MIS to incorrectly assign VSLAs. MIS data from the first quarter of 2017 was used. Thus, we prioritise the data collected from village agents above that of the MIS given this time delay.

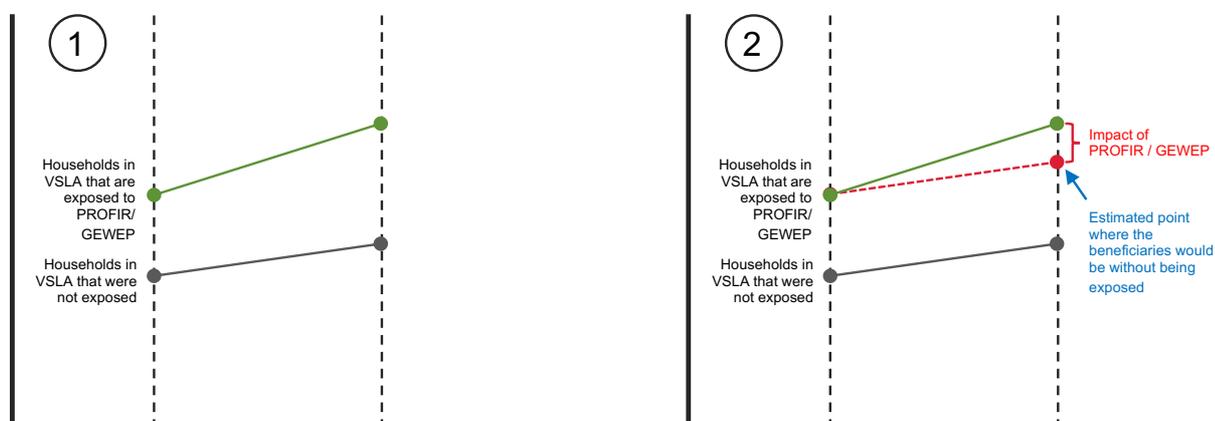
Nevertheless, this report provides analysis using both methods of assignment for completeness. However, the assignment based on calling results in a greater number of significant results (15) than the assignment based on the MIS (4), and presents a more likely source of the true impact of the programmes.

METHOD OF ANALYSIS

A difference-in-difference approach is used to estimate the impact achieved by the programme. The difference-in-difference estimation exploits the pre-intervention baseline data and data gathered during the post-intervention follow-up survey. The principal idea is that a comparison is drawn between the survey data of the 'treatment' and control groups, both before and after the intervention. The developments in both groups' individual households are then compared and the differences in the trends provide a measure of the causal effect of the intervention.

The following figure graphically illustrates how, in theory, this method estimates the attributable impact of the financial education included in PROFIR (hereon referred to as PROFIR):

Figure 2: Simplified explanation of the evaluation design



Estimating the difference-in-differences

	Baseline	Endline	Difference
Annual income (treatment group)	USD 1 000	USD 1 500	USD 500
Annual income (control group)	USD 800	USD 1 100	USD 300
Difference	USD 200	USD 400	USD 200

Difference-in-difference

Parallel trend assumption

Annual income (treatment group without treatment)	USD 1 000	USD 1 300	USD 300
Annual income (control group)	USD 800	USD 1 100	USD 300

same difference in absence of treatment

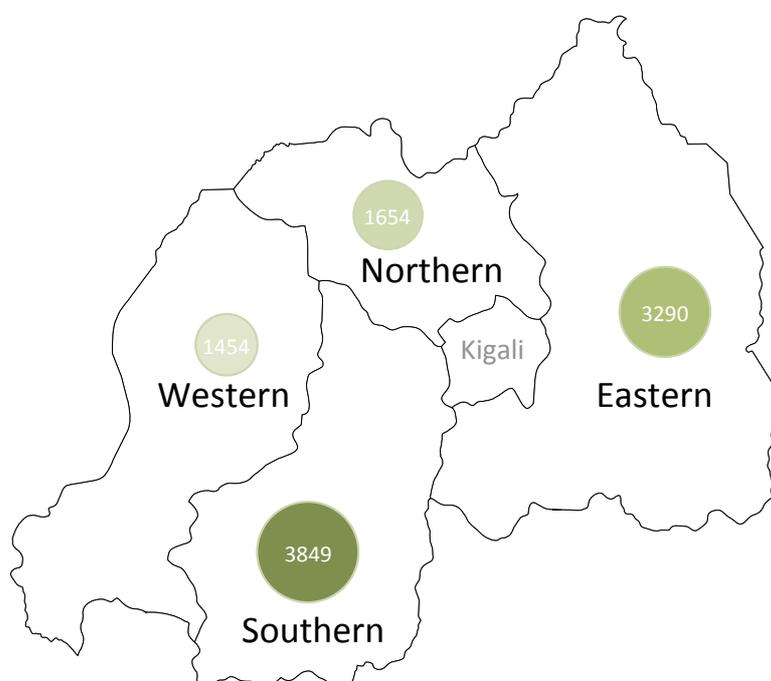
Detail on how these differences are estimated are presented in Annex a: Difference-in-differences. The following section explains in more detail how the control and treatment group are sampled to estimate the difference-in-differences, and hence, impact.

SAMPLE SELECTION

Population

The PROFIR target population is predominantly comprised of VSLAs that were formed under CARE's SAFI and VSLA Scale Up programmes in Rwanda. SAFI ended in 2012 and these groups have completed between two and four cycles, while the newer VSLA Scale Up programme ran between 2013 and 2015.

PROFIR aimed to provide financial literacy training and linkage sensitisation, through Village Agents, to 300 143 VSLA members or 10 247 VSLAs across Rwanda. The geographical split of the targeted population of VSLAs is illustrated in the diagram below, where the circles represent the number of VSLA per province:



Sampling frame

“For the purposes of this evaluation and its objectives, the combination of the financial literacy training and then the linkage of the group with a formal FSP will be considered when evaluating the household benefits attributable to PROFIR. While the training alone may result in benefits to the household through improved financial literacy and capability, it is considered a necessary first step in the creation of the linkages. Thus, only groups that are yet to receive training will be included in the baseline sample, which is possible given that only a small number of groups would have been trained by March/April 2015 (when the baseline is expected to occur).” - Inception report

The assumption asserted in the inception report for this evaluation, and which is quoted above, was incorrect, as the baseline occurred a month later and training rolled out much faster than anticipated. Thus, due to roll out having already begun and being almost completed in the Western, Eastern and Northern provinces, the Southern Province was the only remaining viable province from which to pull a baseline sample.

A list of VSLAs from the Southern Province, provided by CARE Rwanda, served as the sampling frame. Two southern districts, Kamonyi and Muhanga, were missing in the data. However, there are only a total of 29 VSLAs in Kamonyi and 94 in Muhanga. Consequently, the sample only includes six of the Southern Province's eight districts: Gisagara, Huye, Nyamagabe, Nyanza, Nyaruguru and Ruhango.

A further parametrisation of the sampling frame was limiting the selection of VSLAs to those that were not in their third or fourth cycle. This restriction was applied to improve the comparability of drawn sample VSLAs and reduce the chance of selecting outliers, as 84% of the VSLAs in the sampling frame were either in their third or fourth cycle. Thus, the evaluation focused on VSLAs that are only in the Southern Province and were between three and four years old at the time of the baseline evaluation phase.

Sample

The purpose of the quantitative survey in Rwanda's Southern Province was to survey a statistically valid sample of VSLA members to infer generalisable results for all existing Rwandan VSLAs. At the baseline phase of the evaluation, a two-stage random sampling process was adopted (See Annex c: Baseline sampling method). The endline sample consisted of the VSLAs and VSLA members sampled at the baseline phase of the evaluation. Forty-three VSLAs that were part of the baseline sample were not included in the endline survey, the reasons for which are described below:

- 23 VSLAs no longer existed by endline;
- 19 VSLAs were unfound; and,
- 1 VSLA group refused to participate.

A total of 240 VSLA groups were reached with 1 178 individual members being interviewed. Of the 1 178 interviewed, 287 were replacements for the original sample. The most prevalent reason for not being able to interview someone was that they had moved to a new location or moved to a new VSLA.

DATA COLLECTION

Data collection was comprised of two distinct activities, the first of which was quantitative in nature and involved a repeat of the member and VSLA surveys initiated during the baseline phase of the evaluation in 2015. The second data collection process consisted of focus group discussions with a purposefully selected sample of VSLAs from four provinces. Both data collection activities are elaborated on in the sections that follow.

Survey instrument design

Since the purpose of this evaluation is to rigorously assess the effect of PROFIR on various dimensions of the livelihoods of VSLA members at the household level, a quantitative survey tool was designed that focuses on a diverse range of indicators on people's livelihood and well-being. The tool used for the endline was largely similar to that used during the baseline phase of the evaluation, with minor adjustments made on the basis of lessons learnt through the baseline.

The survey is quantitative in that the responses to survey questions are aggregated to draw general inferences about the impact of PROFIR. To meet the aims of the survey, the questionnaire took on a structured design that provided a script for presenting a standard set of questions and response options; for example, respondents were asked to respond to questions in a standard format, or select an answer out of a predetermined list of potential answers, or use a numerical scale to rate their feelings for or understanding of a certain concept.

The survey was implemented using an electronic web-based application, which allowed for an electronic data collection process using tablets. The use of an electronic system, as opposed to a paper form-based system,

limited the potential for incorrect data format entry and ensured that respondents were limited to answering questions in a standard way.

An additional survey instrument was designed to collect VSLA-level data and was designed to guide questions about the VSLA to the VSLA's president or leader. The member and VSLA surveys were each designed to take between 45 minutes to one hour to complete. Both surveys are described further below.

Member questionnaire design

Due to the potentially broad effects of PROFIR the questionnaire was designed to cover a wide variety of indicators to ensure that all potential impacts could be tested. The following areas of interest were investigated by the questionnaire:

- Demographic and non-finance specific questions
- Financial inclusion
- Financial literacy
- Economic welfare
- Household decision-making
- Subjective wellbeing

More details on these topics are presented in Annex d: Outcomes investigated.

VSLA questionnaire

A more general questionnaire was designed to elicit VSLA characteristics. This survey was designed to be used to interview the president or leader of the randomly selected VSLA. The questionnaire includes questions on the number of members of the group, value of a share, return on the last share out, and the maximum amount of money one member is allowed to borrow. A particular focus is set on their access to formal financial services as a group, with questions asking about group accounts at banks or SACCOs.



DESCRIPTIVE STATISTICS AND BALANCING

This section reviews the basic characteristics of the control and treatment groups at the endline phase of the evaluation, including demographics and other socio-economic variables. Comparing the groups on this basis allows for an assessment of the balancing of the treatment and control groups in terms of these observable characteristics. This section focuses on using the balancing of the treatment and control using the VA determined measure of treatment, as opposed to the CARE MIS measure for reasons discussed in the Section: PROFIR and GEWEP. Nevertheless, we summarise the balancing for the CARE MIS measure at the end of the section by reporting on only the significant differences.

To keep information manageable, standard deviations and p-values are not reported. Where statistically significant differences exist, the significance level is indicated by asterisks.⁸

VSLA-LEVEL DATA COMPARISON

The VSLA questionnaire was designed to collect information at the VSLA level and to characterise and understand the development of VSLAs. As indicated in Table 1 below, the control and treatment groups are similar in terms of the year the VSLA was formed, the number of group members and frequency of defaults. However, there is a statistically significant difference in the reported average returns on previous share out of 22,63% for control groups and 32,86% for treatment groups. This suggests more active lending within the treatment groups.

Table 1: General statistics on the sampled VSLAs

	Control		Treatment	
	Mean	Obs	Mean	Obs
Year formed	2011	78	2011	118
Members	28,14	78	28,31	118
Returns on previous share out (%)	22,63	64	32,86*	100
Frequency of defaults	1,67	78	1,73	118

Source: PROFIR endline dataset, 2017

This difference is not significant when using the CARE MIS defined treatment and control allocation. However, using this method of assignment, we find a significant difference between frequency of defaults, with a control mean of 1.5 and a treatment mean of 1.81 and the difference significant at the 5% level.

DEMOGRAPHIC CHARACTERISTICS

In this section, we present descriptive statistics on socio-economic variables among VSLA members to establish whether the control and treatment groups are balanced in terms of these key characteristics.

For each characteristic, we begin by reviewing the mean value at baseline for control and treatment groups, focusing specifically on individuals who were found at both baseline and endline phases of the evaluation (the original sample without replacement). Then, we review the mean values for control and treatment groups including replacement participants. As baseline data are not available for replacement individuals, endline values for these participants have been imputed to the baseline. This approach allows us to scrutinise the

⁸ The asterisks refer to the significance level detected by the t-tests on differences in means between control and treatment groups, and the original sample and replacement groups, where * indicates a 5% significance level and ** indicates a 1% significance level.

balancing of the two groups, including whether the replacement sample introduces statistically significant differences between the control and treatment groups in terms of these observable characteristics.

Individual level characteristics

As depicted in Table 2 below, the average VSLA member in both control and treatment groups is female, in their early forties, belongs to Ubudehe category two, and resides in a household of five people. These values hold when we review the individual demographic structure for the two groups including replacement, as indicated in Table 3 below.

Table 2: Individual socio-economic demographic structure (original sample)

	Control		Treatment	
	Mean	Obs	Mean	Obs
<i>Demographics</i>				
Age (in years)	43,27	241	44,17	479
Female	0,80	241	0,78	479
Ubudehe category (1 - 4)	2,00	228	2,02	468
<i>Marital status</i>				
Single (proportion)	0,08	240	0,05	477
Widowed (proportion)	0,20	240	0,13	477
Divorced (proportion)	0,07	240	0,05	477
Married (proportion)	0,65	240	0,76	477
<i>Highest level of education attained</i>				
Primary education or less	0,89	223	0,89	454
Secondary education and more	0,10	223	0,08	454
Other education	0,01	223	0,04	454
<i>Literacy level</i>				
Literacy	0,67	240	0,63	474
Spelling (proportion of respondents able to spell the Kinyarwanda word 'bee' correctly)	0,60	221	0,59	479

Source: PROFIR endline dataset, 2017

Table 3: Individual socio-economic demographic structure (including replacement)

	Control		Treatment	
	Mean	Obs	Mean	Obs
<i>Demographics</i>				
Age (in years)	42,90	370	43,90	603
Female	0,78	370	0,79	603
Ubudehe category (1 - 4)	2,17	354	2,11	590
<i>Marital status</i>				
Single (proportion)	0,07	369	0,05	601
Widowed (proportion)	0,20	369	0,15	601
Divorced (proportion)	0,07	369	0,05	601
Married (proportion)	0,66	369	0,75	601
<i>Highest level of education attained</i>				
Primary education or less	0,90	332	0,90	547
Secondary education and more	0,08	332	0,07	547
Other education	0,01	332	0,03	547
<i>Literacy level</i>				
Literacy	0,73	369	0,65	598
Spelling (proportion of respondents able to spell the Kinyarwanda word 'bee' correctly)	0,72	350	0,65	568

Source: PROFIR endline dataset, 2017

However, a comparison between the tables above shows that the mean Ubudehe category value increased for both control and treatment groups with the inclusion of the replacement participants. This is driven by a

statistically significant difference in the mean Ubudehe category values between the original sample and replacement group at the 1% level, indicating that replacement participants are slightly less impoverished than the individuals in the original sample. This difference is indicated in Table 4 below.

Table 4: Ubudehe category for original sample and replacement groups

	Original sample		Replacement	
	Mean	Obs	Mean	Obs
Ubudehe category (1 - 4)	2,00	835	2,46**	301

Source: PROFIR endline dataset, 2017

Table 2 and Table 3 above also present the results of the educational questions. The differences in educational characteristics between control and treated individuals are not remarkable, both for the original sample as well as with replacement. The highest level of education reported by sampled individuals is uniformly low, with approximately 90% of both control and treatment groups reporting to have attained primary school education or less, both in the original sample and with replacement participants.

Respondents were also asked to indicate whether they can read and write, described here as 'literacy'. As indicated in Table 2 above, the results of this question are similar for both control and treatments groups. Additionally, enumerators proved the respondents' ability to read and write by asking them to write the Kinyarwanda word for 'bee' on a piece of paper. This small test eliminates the likelihood that respondents overestimate their ability to read or write. As with the results of the literacy question, a similar proportion of individuals in the control and treatment groups spelt 'bee' correctly, at 60% and 59% of respondents, respectively.

However, when we review the results of these questions including the replacement individuals, we find that a higher proportion of respondents in both the control and treatment groups reported to be able to read and write, and correctly spelt the Kinyarwanda word for 'bee', as indicated in Table 3 above. While these differences between the control and treatment groups including replacement were not statistically significant, they are driven by the replacement individuals included in the sample. When disaggregating the participants by the original sample and the replacement sample, we find a statistically significant difference in literacy and spelling at the 1% level. Replacement participants reported higher mean results for both literacy and spelling, indicating that individuals in the replacement group are generally more literate than individuals in the original sample. These results are indicated in Table 5 below.

Table 5: Literacy level among the original sample and replacement groups

	Original sample		Replacement	
	Mean	Obs	Mean	Obs
<i>Literacy level</i>				
Literacy	0,59	868	0,96**	239
Spelling (proportion of respondents able to spell the Kinyarwanda word for 'bee' correctly)	0,65	862	0,78**	306

Source: PROFIR endline dataset, 2017

Household level characteristics

This section reviews the household and family characteristics for the control and treatment groups, both for the original sample as well as including the replacement sample. Table 6 below indicates that on average 80% of participants in the control have dependents, and 84% in the treatment group. The average VSLA member in both the control and treatment groups resides in a household with approximately four other people. While the table indicates slight differences in these variables between the control and treatment groups, these differences are not statistically significant.

As shown in Table 7 below, there is a similar pattern with respect to these variables for the control and treatment groups when replacement participants are included in the sample.

Table 6: Household and family characteristics (original sample)

	Control		Treatment	
	Mean	Obs	Mean	Obs
Household size (number of household members)	5,02	241	5,15	478
Dependents	0,80	241	0,84	478
Toddlers (0-5)	0,67	241	0,71	478
Children (6-12)	1,07	241	1,15	478
Youth (13-17)	0,68	241	0,76	478

Source: PROFIR endline dataset, 2017

Table 7: Household and family characteristics (with replacement)

	Control		Treatment	
	Mean	Obs	Mean	Obs
Household size (number of household members)	5,05	370	5,12	602
Dependents	0,80	370	0,84	602
Toddlers (0-5)	0,61	370	0,71	602
Children (6-12)	1,05	370	1,10	602
Youth (13-17)	0,71	370	0,77	602

Source: PROFIR endline dataset, 2017

Summary

The above show that the treatment and control groups are sufficiently balanced for this analysis, with little to no significant differences between them. *This holds true when using the CARE MIS allocation of treatment and control too.*

FINDINGS AND ANALYSIS

The findings and analysis section is organised by first presenting the impact findings on the group-level indicators, followed by those on the household-level indicators, and finally discusses the impacts at the individual level.

Box 1: Guide to interpreting regression results

Indicators of linkages with formal financial institutions	Group has a formal account		Group has savings with a formal institution		Group has taken out credit from a formal institution		Value of credit taken out from a formal institution	
	VA	MIS	VA	MIS	VA	MIS	VA	MIS
Treatment assignment								
Post	0.100** (0.0494)	0.0711 (0.0574)	0.114** (0.0579)	0.0345 (0.0645)	0.0143 (0.0609)	0.103 (0.0669)	-49,346 (100,997)	197,823* (108,522)
Treatment	-0.0494 (0.0441)	-0.0550 (0.0468)	-0.0717 (0.0517)	-0.0843 (0.0524)	0.0668 (0.0544)	0.0582 (0.0544)	-25,532 (90,143)	83,827 (88,435)
Impact of PROFIR	0.0356 (0.0624)	0.0514 (0.0659)	0.0137 (0.0730)	0.105 (0.0741)	0.0685 (0.0768)	-0.0776 (0.0768)	246,066 (127,482)*	-103,447 (124,614)
Constant	0.871*** (0.0350)	0.877*** (0.0408)	0.843*** (0.0409)	0.862*** (0.0456)	0.0857** (0.0431)	0.0862* (0.0473)	151,143** (71,416)	57,018 (77,070)
Observations	376	392	377	393	377	393	376	392
R-squared	0.046	0.038	0.039	0.033	0.026	0.028	0.024	0.026

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Value of credit taken out from a formal institution	Baseline	Endline	Difference
Control	USD 151.143	USD 101.797	- USD 49.346
Treatment	USD 125.611	USD 322.331	USD 196.720
Difference	USD 25.532	- USD 220.534	USD 246.066 <i>Difference-in-differences</i>

The regression output illustrates the calculation of the difference in differences between baseline and endline and control and treatment. The illustrative table below the example regression output above shows how the "impact of PROFIR" result is determined with subtraction. The key figures of interest in the regression tables are the red values in the *Impact* row

GROUP-LEVEL INDICATORS

One of the main focuses of PROFIR was on driving formal financial inclusion by training VSLA on forming linkages with formal financial institutions, such as banks, microfinance institutions and SACCOs. These linkages could provide a formal savings account to the VSLAs or extend credit options. The extension of credit to the groups could then allow for larger loans to be given out to its members. The inability of VSLA to provide larger loans to its members has been established as one of their limitations.

Table 8: Group-level inclusion indicators

Indicators of linkages with formal financial institutions	Group has a formal account		Group has savings with a formal institution		Group has taken out credit from a formal institution		Value of credit taken out from a formal institution	
	VA	MIS	VA	MIS	VA	MIS	VA	MIS
Treatment assignment								
Post	0.100** (0.0494)	0.0711 (0.0574)	0.114** (0.0579)	0.0345 (0.0645)	0.0143 (0.0609)	0.103 (0.0669)	-49,346 (100,997)	197,823* (108,522)
Treatment	-0.0494 (0.0441)	-0.0550 (0.0468)	-0.0717 (0.0517)	-0.0843 (0.0524)	0.0668 (0.0544)	0.0582 (0.0544)	-25,532 (90,143)	83,827 (88,435)
Impact	0.0356 (0.0624)	0.0514 (0.0659)	0.0137 (0.0730)	0.105 (0.0741)	0.0685 (0.0768)	-0.0776 (0.0768)	246,066 (127,482)*	-103,447 (124,614)
Constant	0.871*** (0.0350)	0.877*** (0.0408)	0.843*** (0.0409)	0.862*** (0.0456)	0.0857** (0.0431)	0.0862* (0.0473)	151,143** (71,416)	57,018 (77,070)
Observations	376	392	377	393	377	393	376	392
R-squared	0.046	0.038	0.039	0.033	0.026	0.028	0.024	0.026

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

First, we establish whether the financial inclusion programmes resulted in more VSLA opening accounts with formal financial institutions, but find that there is no statistical evidence to suggest this is true using either the VA treatment allocation or CARE's MIS. It is important to note that the majority (94.61%) of VSLA at endline had a group account with either a bank, SACCO, or MFI. However, this is primarily driven by the prevalence of SACCO accounts and not necessarily linkage partners.

The proportion of VSLA that have made savings as a group with a formal financial institution has not been impacted on either; however, the matter of credit is more complicated. Table 8 shows that while there has been no significant increase in the number of groups accessing credit, the financial inclusion programmes have resulted in groups taking out larger amounts of credit on average from formal financial institutions. *This finding is not significant when using the CARE's MIS specification of treatment.*

No other group-level outcomes, such as share values or default frequency were founded to be significantly influenced by financial inclusion programmes.

HOUSEHOLD INDICATORS

Household expenditure

The effects of financial inclusion programmes on household expenditure are not significant for the entire group, but are varied by age group. When disaggregating expenditure by type, the younger and more mature groups appear to have had opposite experiences as a result of financial inclusion programmes, with the younger spending more on health, communication, and medical expenses for their female dependents; while the more mature spend less on rent, health, medical expenses for their female dependents, and less on female education. However, we cannot conclude that there has been an overall change in household expenditure.

Using the MIS defined treatment, we find that there has been a reduction on food expenditure and an increase in expenditure on eating outside of the households at restaurants.

Table 9: Composite household expenditure on day-to-day needs⁹

Household expenditure on day-to-day needs	Food		Clothes (for the whole family)		Restaurants / eating out		Communication	
	VA	MIS	VA	MIS	VA	MIS	VA	MIS
Treatment assignment								
<i>Impact (whole sample)</i>	0.017 [0.023]	-0.042 [0.025]*	-0.017 [0.066]	0.054 [0.069]	0.027 [0.058]	0.097 [0.051]*	0.007 [0.052]	0.081 [0.050]
<i>Impact on young</i>	0.034 [0.039]	-0.046 [0.045]	-0.006 [0.100]	0.105 [0.094]	0.127 [0.101]	0.039 [0.081]	0.155 [0.091]*	0.120 [0.097]
<i>Impact on middle aged</i>	0.037 [0.032]	-0.070 [.025]***	-0.054 [0.102]	-0.101 [0.114]	0.033 [0.084]	0.128 [0.075]*	0.007 [0.098]	0.090 [0.081]
<i>Impact on mature</i>	-0.003 [0.025]	-0.008 [0.020]	-0.019 [0.103]	0.203 [0.084]**	-0.038 [0.075]	0.128 [0.078]	-0.090 [0.082]	0.078 [0.087]

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Household expenditure on day-to-day needs	Water		Transport (public and private)		Rent (house and fields)	
	VA	MIS	VA	MIS	VA	MIS
Treatment assignment						
<i>Impact (whole sample)</i>	0.035 [0.050]	0.066 [0.053]	0.011 [0.054]	0.065 [0.057]	-0.044 [0.064]	0.092 [0.059]
<i>Impact on young</i>	0.079 [0.083]	0.124 [0.094]	0.091 [0.097]	0.097 [0.099]	0.121 [0.098]	0.121 [0.099]
<i>Impact on middle aged</i>	0.023 [0.075]	-0.025 [0.085]	-0.002 [0.097]	-0.045 [0.082]	-0.011 [0.110]	0.072 [0.099]

⁹ This table represents the output of four distinct difference-in-differences estimations with the latter three being estimated on parameterised samples

<i>Impact on mature</i>	0.012 [0.088]	0.114 [0.097]	-0.042 [0.077]	0.180 [0.088]**	-0.194 [0.084]**	0.122 [0.084]
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Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Table 10: Composite household expenditure on health and education¹⁰

Household expenditure on health and education	Educational expenditures		Health expenditures		Medical expenses and other health services for the females in your household	
	VA	MIS	VA	MIS	VA	MIS
<i>Impact (whole sample)</i>	-0.051 [0.094]	0.025 [0.102]	0.034 [0.138]	0.185 [0.150]	0.024 [0.070]	-0.050 [0.052]
<i>Impact on young</i>	0.096 [0.139]	-0.070 [0.149]	0.406 [0.190]**	0.058 [0.191]	0.199 [0.098]**	0.099 [0.107]
<i>Impact on middle aged</i>	-0.097 [0.157]	-0.057 [0.170]	0.199 [0.235]	0.219 [0.211]	0.094 [0.123]	0.147 [0.115]
<i>Impact on mature</i>	-0.195 [0.121]	0.165 [0.150]	-0.438 [0.176]**	0.293 [0.238]	-0.201 [0.088]**	0.250 [0.105]**

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Household expenditure on health and education	Medical expenses and other health services for the males in your household		Schooling expenses for females (materials, school fees, transport)		Schooling expenses for males (materials, school fees, transport)	
	VA	MIS	VA	MIS	VA	MIS
<i>Impact (whole sample)</i>	0.043 [0.070]	-0.058 [0.054]	-0.049 [0.050]	0.034 [0.043]	-0.003 [0.053]	0.025 [0.043]
<i>Impact on young</i>	0.161 [0.106]	0.029 [0.098]	0.044 [0.081]	-0.140 [0.087]	0.051 [0.078]	0.069 [0.080]
<i>Impact on middle aged</i>	0.140 [0.109]	0.212 [0.096]**	-0.114 [0.093]	-0.003 [0.096]	0.017 [0.083]	-0.053 [0.094]
<i>Impact on mature</i>	-0.137 [0.097]	0.147 [0.132]	-0.117 [0.067]*	0.113 [0.080]	-0.078 [0.075]	0.051 [0.091]

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

When looking at household expenditure on income generating activities there are no significant results to suggest that the financial inclusion programmes impact on these; however, when restricting the sample by age group, we find that the mature and middle aged reduce their household expenditure on farming inputs and income generating activities respectively. Although concerning, this may be explained by the finding presented in the next section which suggests that more mature individuals are moving away from agricultural activities.

Using the MIS defined treatment, we find that there has been an increase in spending on agricultural expenses, but this is not the case for the younger beneficiaries.

Table 11: Composite household expenditure on income generating activities¹¹

Household expenditure on income generating activities	Livestock breeding		Income generating activities		Agricultural expenses (seeds fertilizer dung pesticides & workers)	
	VA	MIS	VA	MIS	VA	MIS
<i>Impact (whole sample)</i>	-0.021 [0.061]	0.054 [0.060]	-0.062 [0.057]	0.060 [0.057]	-0.101 [0.069]	0.202 [0.066]**
<i>Impact on young</i>	0.042 [0.100]	0.011 [0.098]	-0.022 [0.101]	0.140 [0.109]	0.108 [0.114]	-0.002 [0.111]
<i>Impact on middle aged</i>	0.015 [0.099]	0.118 [0.084]	-0.161 [0.076]**	0.014 [0.078]	-0.118 [0.098]	0.262 [0.096]**

¹⁰ This table represents the output of four distinct difference-in-differences estimations with the latter three being estimated on parameterised samples

¹¹ This table represents the output of four distinct difference-in-differences estimations with the latter three being estimated on parameterised samples

<i>Impact on mature</i>	-0.084 [0.091]	0.068 [0.100]	-0.019 [0.082]	0.076 [0.075]	-0.239 [0.096]**	0.337 [0.100]***
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Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Household income

Examining household income and related indicators, we find that there are no significant impacts of the financial inclusion programmes on the whole; however, when disaggregated by age group, we find that there is a movement of older people away from agricultural activities, as a result of programmes. Furthermore, we find that the middle-aged move down in the Ubudehe categories, reduce their annual expenditure, and take out more credit from their VSLA for income generating activities as a result of the programmes. The reduction in expenses may allow the middle aged to balance household budgets better. The increase in loans for income generating activities may be related to this adjustment, as the individual establishes the need to generate more income and takes out additional credit to pay for these activities.

Income and employment	Ubudehe		Annual expenditures (log) [proxy for income]		VSLA loan for ICA		Business	
	VA	MIS	VA	MIS	VA	MIS	VA	MIS
Treatment assignment								
<i>Impact (whole sample)</i>	-0.114 [0.078]	0.008 [0.080]	-0.144 [0.099]	0.081 [0.110]	0.065 [0.064]	-0.128 [0.062]**	-0.050 [0.054]	-0.014 [0.063]
<i>Impact on young</i>	-0.093 [0.129]	-0.040 [0.132]	0.007 [0.181]	0.236 [0.207]	-0.090 [0.112]	-0.164 [0.116]	-0.138 [0.104]	-0.099 [0.129]
<i>Impact on middle aged</i>	-0.288 [.104]***	0.077 [0.099]	-0.304 [0.149]**	0.014 [0.169]	0.241 [0.100]**	-0.149 [0.103]	-0.091 [0.077]	0.103 [0.080]
<i>Impact on mature</i>	0.012 [0.121]	-0.009 [0.121]	-0.124 [0.161]	0.046 [0.173]	0.043 [0.095]	-0.117 [0.086]	0.016 [0.074]	-0.057 [0.083]

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Income and employment	Is the business yours or did you help one of your family members start it?		Do you employ any other persons (paid labour)?		How many do you employ?		Main occupation is non-agricultural	
	VA	MIS	VA	MIS	VA	MIS	VA	MIS
Treatment assignment								
<i>Impact (whole sample)</i>	-0.047 [0.050]	0.080 [0.065]	0.005 [0.047]	0.096 [0.046]**	0.325 [1.151]	-0.211 [0.571]	0.065 [0.049]	-0.013 [0.048]
<i>Impact on young</i>	0.003 [0.087]	-0.021 [0.108]	0.062 [0.082]	0.129 [0.087]	-1.315 [0.962]	-0.007 [0.951]	0.027 [0.088]	-0.052 [0.093]
<i>Impact on middle aged</i>	-0.037 [0.087]	0.050 [0.082]	-0.084 [0.085]	0.116 [0.072]	-1.646 [1.333]	0.706 [1.073]	0.032 [0.071]	0.047 [0.069]
<i>Impact on mature</i>	-0.139 [0.090]	0.296 [0.190]	0.022 [0.061]	0.068 [0.059]	2.864 [2.860]	-1.751 [1.483]	0.128 [0.060]**	-0.032 [0.055]

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Using the MIS treatment definition, we find that on average less people take out loans for income generating activities as a result of the financial inclusion programmes. While they also appear to hire more people as a result of the financial inclusion programmes.

Household food security and vulnerability

To examine food security and vulnerability we examine the effects of the financial inclusion programmes on food production, food availability, and the ability of the households to cope with shock expenditures. As can be seen in the following table, the financial inclusion programmes have reduced the reported number of days in the past 6 months that a household has gone without food by more than 5 days on average. This is the only indicator of food security and vulnerability that has shown a significant change as a result of the financial

inclusion programmes. However, this suggests that beneficiaries may now be better able to plan or smooth their food consumption as a result of the financial inclusion programmes.

Indicators of vulnerability and food security	Emergency in past 12 months		Pay for emergency without sale of assets		Afford to pay for emergency within next 6 months		How many meals were served in your household in the last two days?	
	VA	MIS	VA	MIS	VA	MIS	VA	MIS
Treatment assignment								
Post	0.153 [0.044]***	0.125 [0.045]***	0.136 [0.064]**	0.167 [0.068]**	0.003 [0.061]	-0.005 [0.070]	-0.391 [0.097]***	-0.444 [0.110]***
Treatment	-0.089 [0.046]*	-0.077 [0.047]	0.049 [0.065]	0.042 [0.061]	-0.075 [0.056]	-0.004 [0.058]	0.018 [0.096]	-0.047 [0.105]
Impact	0.045 [0.057]	0.049 [0.054]	-0.089 [0.081]	-0.115 [0.081]	-0.065 [0.076]	-0.006 [0.079]	0.076 [0.118]	0.174 [0.124]
Female	-0.007 [0.033]	-0.007 [0.030]	0.024 [0.041]	0.011 [0.036]	-0.126 [0.041]***	-0.134 [0.038]***	-0.098 [0.064]	-0.105 [0.060]*
Observations	1,440	1,736	726	878	1,418	1,712	1,440	1,736
R-squared	0.049	0.036	0.018	0.021	0.016	0.010	0.037	0.037

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Indicators of vulnerability and food security	In the past 6 months was there at least one day in which your household did not have food?		Days without food during last 6 months		Did you produce enough cereal and other agricultural products during the season?		Were you able to purchase food to supplement your harvest?	
	VA	MIS	VA	MIS	VA	MIS	VA	MIS
Treatment assignment								
Post	0.146 [.035]***	0.182 [0.048]***	6.537 [2.341]***	3.596 [1.581]**	-0.120 [0.038]***	-0.076 [0.037]**	0.013 [0.033]	0.023 [0.046]
Treatment	0.008 [0.027]	-0.030 [0.029]	4.293 [1.755]**	0.110 [1.224]	-0.003 [0.037]	-0.019 [0.038]	-0.017 [0.031]	0.043 [0.031]
Impact	0.072 [0.045]	-0.020 [0.053]	-5.494 [2.776]**	-0.607 [1.975]	0.045 [0.045]	0.009 [0.043]	-0.033 [0.041]	-0.029 [0.050]
Female	0.060 [0.027]**	0.061 [0.024]**	-0.488 [1.568]	-0.052 [1.340]	-0.027 [0.026]	-0.033 [0.023]	-0.025 [0.017]	-0.027 [0.015]*
Observations	1,440	1,736	313	373	1,439	1,735	1,356	1,625
R-squared	0.064	0.047	0.062	0.049	0.021	0.016	0.018	0.013

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

INDIVIDUAL-LEVEL INDICATORS

Financial literacy

Following the impact pathway, we examine the impact on financial literacy, using a standard financial literacy test.¹²

Table 12: Impact on financial literacy

Indicators of financial literacy	Financial literacy index		Financial literacy dummy	
	VA	MIS	VA	MIS
Treatment assignment				
Female	-0.407 (0.071)***	-0.345 [0.063]***	-0.121 (0.031)***	-0.103 [0.027]***
Post	0.154 (0.124)	0.129 [0.129]	0.049 (0.043)	0.003 [0.048]
Treatment	-0.028 (0.112)	0.041 [0.107]	0.034 (0.038)	0.013 [0.036]

¹² Cole, S., Sampson, T. and B. Zia (2011), Prices or knowledge? What drives demand for financial services in emerging markets? The Journal of Finance, 66(6), 1933-1967.

Impact	0.009	0.074	-0.076	-0.005
	(0.151)	(0.147)	(0.053)	(0.055)
Observations	1,440	1,736	1,440	1,736
R-squared	0.029	0.027	0.021	0.015

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Indicators of financial literacy	Interest question		Inflation question		Crops question		Credit question	
	VA	MIS	VA	MIS	VA	MIS	VA	MIS
Treatment assignment	VA	MIS	VA	MIS	VA	MIS	VA	MIS
Female	-0.118	-0.087	-0.093	-0.105	-0.071	-0.043	-0.126	-0.154
	(0.025)***	(0.024)***	(0.029)***	(0.028)***	(0.027)***	(0.027)	(0.034)***	(0.032)***
Post	0.140	0.129	0.016	0.003	0.074	0.096	-0.076	0.036
	(0.053)***	[0.129]	(0.050)	[0.048]	(0.039)*	[0.055]*	(0.052)	[0.048]
Treatment	-0.021	0.041	-0.008	0.013	0.013	-0.004	-0.013	0.040
	(0.048)	[0.107]	(0.048)	[0.036]	(0.045)	[0.044]	(0.047)	[0.045]
Impact	-0.014	0.074	0.027	-0.005	-0.040	0.040	0.036	0.014
	(0.061)	(0.147)	(0.061)	(0.055)	(0.050)	(0.061)	(0.064)	(0.056)
Observations	1,440	1,736	1,440	1,736	1,440	1,736	1,440	1,736
R-squared	0.036	0.033	0.010	0.010	0.011	0.009	0.021	0.017

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

The findings of the evaluation show that there is no evidence that the financial inclusion programmes have resulted in improvements in financial literacy using this standardised test. We further test to see if results hold if the sample is divided into three age groups – young (younger than 35), middle aged (36 – 50), and mature (older than 50) – and find that there are still no significant impacts. We parameterise the sample by gender and still find no significant impact.

The assertion by CARE Rwanda that GEWEP does not prioritise financial literacy may be the cause behind the lack of impact on financial literacy.

Financial inclusion, behaviours, and attitudes

While there seems to be no impact on financial literacy, we establish whether there has been a change in reported financial inclusion and financial behaviours.

Table 13: Composite table of financial inclusion and behaviours¹³

Indicators of financial inclusion and behaviour	Formal financial inclusion		Accumulated savings in the last 12 months		How many loans has your household taken out in the last 12 months?		Total loan amount (log)	
	VA	MIS	VA	MIS	VA	MIS	VA	MIS
Treatment assignment	VA	MIS	VA	MIS	VA	MIS	VA	MIS
Impact (whole sample)	0.014	0.041	-0.005	-0.007	-0.339	0.150	-0.030	-0.029
	(0.055)	[0.051]	(0.012)	[0.009]	(0.145)**	[0.168]	(0.095)	[0.090]
Impact on young	0.186	0.131	0.021	-0.003	-0.356	0.573	0.009	0.243
	(0.099)*	[0.091]	(0.015)	[0.011]	(0.267)	[0.278]**	(0.176)	[0.157]
Impact on mid-age	-0.072	0.052	0.005	-0.012	-0.170	0.219	-0.129	0.030
	(0.087)	[0.084]	(0.019)	[0.012]	(0.241)	[0.220]	(0.129)	[0.132]
Impact on mature	-0.090	0.018	-0.029	-0.006	-0.498	-0.234	-0.037	-0.282
	(0.076)	[0.085]	(0.020)	[0.018]	(0.203)**	[0.272]	(0.155)	[0.161]*

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

¹³ This table represents the output of four distinct difference-in-differences estimations with the latter three being estimated on parameterised samples

Indicators of financial literacy	Average loan amount (log)		Total outstanding loans	
	VA	MIS	VA	MIS
Treatment assignment	VA	MIS	VA	MIS
Impact (whole sample)	0.094	-0.133	2,670.956	-3,751.118
	(0.079)	[0.074]*	(7,667.518)	[5,585.134]
Impact on young	0.131	0.243	10,255.077	-861.402
	(0.136)	[0.157]	(13,597.510)	[7,531.772]
Impact on mid-age	-0.028	-0.109	-4,857.889	147.794
	(0.118)	[0.121]	(14,253.920)	[10,738.270]
Impact on mature	0.149	-0.240	2,912.519	-9,197.805
	(0.140)	[0.146]	(9,585.550)	[8,186.277]

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Interestingly, unlike at the VSLA level, using the VA assignment of treatment, the financial inclusion programmes appear to have reduced the uptake of individual credit. As a result of the financial inclusion programmes there has been a reduction in the number of loans reported to be taken out by the individual households, with the overall amount of credit showing no significant changes. This is potentially a positive outcome, as it may illustrate a reduction in unnecessary credit. Conversely, this could also be result of beneficiaries becoming weary of credit as a result of the financial inclusion programmes. The findings are consistent across the age groups; however, the reduction is primarily being driven the more mature adults.

If we use the MIS assignment of treatment, we find that there has only be a reduction in the average loan amount as a result of the programme.

The financial inclusion programmes do not appear to have impacted on formal financial inclusion at a household level for the broader sample; however, there is some evidence to suggest that the financial inclusion programmes have driven formal financial inclusion for younger beneficiaries. This means that the younger beneficiaries are more easily driven to become financially included through the financial inclusion programmes.

In the endline survey we asked respondents to comment on their perception of their ability to save, as well as their risk and time preferences towards money. Given that these questions were only asked in the endline survey, we cannot use the difference-in-differences approach to establish impact, but instead we use a means comparison, which assumes that the delivery of the financial inclusion programmes was approximately random.

Table 14: Assumed experimental design results for attitudes¹⁴

Indicators of attitudes towards saving, risk, and patience	I have a hard time saving money even though I know I want to save money.		Risk preference (higher = more risk loving)		Time preference (higher = more patient)	
	Overall	Gender differentiation	Overall	Gender differentiation	Overall	Gender differentiation
Treatment effect	0.049	0.038	-0.657	-0.340	0.085	0.371
	(0.056)	(0.099)	(0.242)***	(0.418)	(0.065)	(0.165)**
Additional effect on females		0.014		-0.409		-0.369
		(0.110)		(0.458)		(0.173)**
Observations	973	973	961	961	965	965
R-squared	0.016	0.016	0.016	0.017	0.019	0.025

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Assuming random assignment, the financial inclusion programmes appear to have made beneficiaries more cautious or risk averse, and more patient. The data also show that the financial inclusion programmes impact less on females' time preferences than men's. Interestingly, the results do not indicate any significant impacts

¹⁴ Only using VA assigned treatment

to the perceived difficulty of saving money, which is in line with the finding that there is no significant difference in actual savings behaviours.

Decision making in the household

One of the key components of PROFIR and GEWEP is a focus on empowerment. We first examine the impact on decision making within the household, and whether VSLA group members exposed to the financial inclusion programmes now have more power in decision making. Interestingly, we find that the opposite has occurred. The financial inclusion programmes have resulted in a reduction of reported power in decision making. Though this does not make immediate sense, this could be an unintended consequence. Potentially spouses of VSLA members exposed to the financial inclusion programmes are concerned about their own power within the household and have felt the need to assert themselves more. Alternatively, the VSLA members themselves are now more aware of the power imbalance within the household, while at baseline they accepted the status quo of having less power. This is potential result of GEWEP.

Decision making indicators	Involved in investment decisions		Involved in credit decisions		Involved in food expenditure decisions	
	VA	MIS	VA	MIS	VA	MIS
Treatment assignment						
Post	0.054 [0.022]**	0.046 [0.023]*	0.046 [0.018]**	-0.013 [0.014]	0.064 [0.026]**	0.039 [0.026]
Treatment	0.019 [0.024]	-0.010 [0.023]	0.030 [0.019]	-0.038 [0.013]***	0.022 [0.026]	-0.010 [0.023]
Impact	-0.053 [0.028]*	-0.019 [0.028]	-0.077 [0.023]***	0.018 [0.019]	-0.042 [0.031]	-0.002 [0.030]
Female	-0.006 [0.018]	-0.008 [0.016]	0.009 [0.017]	0.002 [0.013]	0.164 [0.026]***	0.161 [0.023]***
Observations	1,412	1,700	1,440	1,736	1,440	1,736
R-squared	0.007	0.008	0.015	0.013	0.062	0.059

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Decision making indicators	Involved in health expenditures for self		Involved in clothes expenditure for self		Involved in energy expenditure decisions	
	VA	MIS	VA	MIS	VA	MIS
Treatment assignment						
Post	0.054 [0.021]**	0.034 [0.018]*	0.050 [0.021]**	0.011 [0.016]	0.117 [0.026]***	0.066 [0.035]*
Treatment	0.013 [0.023]	-0.018 [0.020]	0.022 [0.023]	-0.036 [0.018]**	0.015 [0.033]	-0.043 [0.033]
Impact	-0.024 [0.026]	0.010 [0.022]	-0.041 [0.025]*	0.017 [0.021]	-0.043 [0.036]	0.032 [0.040]
Female	0.024 [0.020]	0.013 [0.016]	0.002 [0.017]	-0.002 [0.014]	0.072 [0.025]***	0.077 [0.022]***
Observations	1,439	1,735	1,440	1,736	1,436	1,731
R-squared	0.016	0.015	0.011	0.012	0.034	0.035

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Next, we look at whether the respondent (the VSLA member) requires permission to make personal decisions and find that the financial inclusion programmes have had no significant impact on the need for permission from one's spouse or family.

Happiness and life satisfaction

We asked participants to rate their own happiness and life satisfaction on a scale. Interestingly, the financial inclusion programmes appear to have had a negative impact on people's reported life satisfaction.

Using the MIS treatment allocation, we find that people's happiness has been reduced as a result of the financial inclusion programmes.

Happiness and satisfaction indicators	Scale of happiness		Scale of life satisfaction	
	VA	MIS	VA	MIS
Treatment assignment				
Post	0.090 [0.051]*	0.246 [0.067]***	-0.253 [0.182]	-0.452 [0.227]**
Treatment	-0.061 [0.057]	0.123 [0.058]**	-0.078 [0.164]	0.131 [0.180]
Impact	-0.074 [0.070]	-0.246 [0.077]***	-0.475 [0.232]**	-0.134 [0.257]
Female	-0.168 [0.044]***	-0.136 [0.038]***	-0.569 [0.142]***	-0.505 [0.128]***
Observations	1,439	1,734	1,430	1,725
R-squared	0.021	0.020	0.041	0.029

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

The reason behind the reduction in life satisfaction could be a result of becoming more aware of one's position. In the endline we tested individuals' financial awareness, and found that (assuming an experimental design) the financial inclusion programmes have improved people's financial awareness. Moreover, as discussed under decision making, if beneficiaries of GEWEP make up our treatment group, and they have been taught more about power imbalances, this could also have spurred greater awareness and made people more aware of difficulties in their lives.



CONCLUSION

It is important to note the challenges experienced in conducting this evaluation, as these should be highlighted and avoided in future evaluations. These include:

- A deviation of the assigned treatment and control groups;
- An inability to retrospectively match groups because of a new MIS system implemented by CARE Rwanda;
- The replacement of PROFIR in the Southern Province with GEWEP and the lack of consultation or communication around this; and,
- The miscommunication from CARE Rwanda that GEWEP was comparable to PROFIR and that the evaluation could continue, which was later rescinded and the differences between the two programmes claimed as being too large to allow inference on PROFIR using the data collected for this evaluation.

CARE Rwanda's MIS if implemented consistently presents an opportunity for rich analysis and experimentation. Thus, the standardisation and institutionalisation of the system across CARE Rwanda's projects should be considered.

Given the above considerations, we recommend that the conclusions and findings of this report are not used to make significant decisions around the design or implementation of PROFIR.

This evaluation has not found evidence to suggest that the financial inclusion interventions in the Southern Province have driven greater linkages between the formal financial sector and VSLA in terms of groups having accounts with formal institutions. This could be a result of the almost ubiquitous access to SACCOs in Rwanda or CARE Rwanda's assertion that the replacement programme that usurped PROFIR in the Southern Province did not have a great focus on the financial inclusion component. Furthermore, we cannot find evidence to suggest that the financial inclusion programmes have led to a greater number of VSLA opening group savings accounts or taking out loans from formal financial institutions. However, we have found that the financial inclusion interventions have driven VSLA to take out larger amounts of credit on average from formal financial institutions.

The impact of the financial literacy training and the larger amounts of credit are ambiguous on the financial behaviour and VSLA households. In particular, there are differences in the impact on the three distinct age groups discussed above. However, certain impacts are consistent, particularly, households seem to be taking out less loans, and individuals are more risk averse and patient as a result of the financial inclusion programmes. It should be noted that programmes implemented in group settings with a one-size-fits-all approach may be inadequate to address personal limitations for behavioural changes or lack of knowledge (Carpena et al., 2017).¹⁵ Moreover, financial behaviour may be difficult to change as people already decide rationally on their borrowings and savings with no scope for significant changes. Furthermore, this intervention was designed for savings groups whose members may already make rational contribution to savings given their income, and thus, VSLA members may already be at their saturation point with regards to savings.

We find that the financial inclusion programmes have had a positive impact on food security, in that the number of days that households have gone hungry in the past six months has decreased. In terms of empowerment, for the individual, we find that the programmes implemented in the Southern Province have resulted in beneficiaries reporting that they are less included in household decision making and have a reduced level of perceived life satisfaction, which could be a result of individuals becoming more self-aware and aware of power

¹⁵ Carpena, F., Cole, S. A., Shapiro, J., & Zia, B. (2017). The ABCs of financial education: Experimental evidence on attitudes, behavior, and cognitive biases. *Management Science*.

dynamics in their households. This is not necessarily a negative finding, and may instead illustrate the beginning stages of empowerment, as people are becoming more aware and critical of their situations.

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Annexes

ANNEX A: DIFFERENCE-IN-DIFFERENCES

To estimate the difference-in-differences coefficients we use regression analysis. The treatment effect, or impact on outcomes of forming linkages, are estimated using the following equation:

$$y_{it} = \beta_0 + \beta_1 S_i + \beta_2 T_t + \beta_3 X_{it} + \delta(S_i \times T_t) + \varepsilon_{it}$$

Where:

- y_{it} is the measurement of the outcome indicator for individual 'i' at time 't';
- S_i is a binary indicator for whether individual 'i' was in the treatment or control group ($S_i = 1$ if in treatment group, and $S_i = 0$ if in control group) {this is used to account for initial difference between the treatment and control groups};
- T_t is a binary indicator for baseline or endline ($T_t = 0$ if at baseline, $T_t = 1$ if at endline) {this is used to account for the changes in outcomes overtime which are not a result of PROFIR};
- X_{it} is a matrix of explanatory characteristic of individual 'i' at time 't', such as household size and gender;
- The betas represent the coefficient (magnitude and sign of the relationship between the indicators and the outcomes);
- $(S_i \times T_t)$ represents the interaction between the time period and treatment status of the individual and this interaction will only take on the value 1 when in the treatment group and in the endline, and will be 0 otherwise; and,
- ε_{it} is merely the error term that captures all unobserved effects.

Thus, in estimating this equation we are able to estimate delta, δ , the coefficient on the interaction term ($S_i \times T_t$), which represents the impact of the financial literacy programmes on the outcome indicators of interest. All other terms in the equation are used to account for any of the initial discrepancies between the control and treatment groups, as well as the any changes in the outcomes that have occurred over time not as a result of PROFIR, thus allowing for the isolation of the causal effect of the linkages on the outcome indicators.

ANNEX B: PROFIR SPLIT ACROSS DISTRICTS IN SOUTHERN PROVINCE

The geographical split of the sampling frame for the Southern Province is illustrated in **Error! Reference source not found.** below.

Figure 3: VSLA split over districts in Southern Province

Ruhango and Huye are the two districts with the largest share of the sampling frame



As can be seen in **Error! Reference source not found.**, the split of VSLAs across four of the districts in the province is evenly spread, ranging from 17,3% to 18,6%, and the Nyanrugu and Nyamagabe districts represent a slightly smaller split, at 15,0% and 13,4%, respectively.

ANNEX C: BASELINE SAMPLING METHOD

This annex reviews the sampling method used to identify participants at the baseline phase of the evaluation.

A stratified sampling strategy was applied to ensure that at least a representative fraction was picked from each district. The stratified selection was proportional to the number of VSLAs per district and a total of 300 VSLA were sampled.

The next step was to randomly select five individuals within each VSLA, resulting in a total sample of 750 individuals from both the treatment and control groups, or 1 500 in total. In the dataset CARE Rwanda provided, on average, a VSLA has approximately 30 members of which, approximately 80% are female. The random selection of individual members was done by first compiling a list of all active members of the visited VSLA. Five names from this list were then randomly selected using a dedicated mobile form and a random number generator on the tablets. An additional five names were selected as possible replacements if the original selection would not be available. Whenever a member of the original sample was unavailable enumerators were instructed to first interview VSLA members that were on the original list and present, to allow for other bystanders to find and call the others on the list. Only if these members were unavailable for the whole day, or unwilling to partake in the survey, a member from the replacement list could be interviewed. At a few VSLA's, where enumerators ran out of sampled and replacement members before reaching the target of five respondents, they were allowed to select respondents at their own discretion; however, these respondents are flagged in the dataset.

As seventeen VSLAs that were part of the original baseline sample were not covered by the survey, the final baseline sample included 139 VSLAs in the control group and 144 in the treatment group.

Source: PROFIR baseline report, 2015

ANNEX D: OUTCOMES INVESTIGATED

Demographic and non-finance specific questions

The questionnaire includes general non-finance specific questions on gender, age, marital status and education level, as well as the number of children in the household, the number of children attending school, and reasons for why children could not attend school.

Financial inclusion

The FinDex and FinScope surveys were used as a basis for generating the questions on financial inclusion. This section of the questionnaire includes questions on household linkages to formal financial institutions, access and frequency of use of different financial services, such as savings and borrowings. The data collected through these questions allowed the evaluation team to obtain insights into the extent to which the programme had an effect on the intensive margin (e.g. usage of existing bank accounts) as well as factors related to the effect on the extensive margin (e.g. opening a bank account).

Financial literacy

The baseline survey included standard financial literacy to estimate the baseline level of respondents' financial literacy and establish how much (or how little) people understood about financial decision-making. To assess the benefits at the household level that VSLA members gained from the financial literacy training, this survey was implemented for a second time during the endline phase of the evaluation. The questions included in this section of the survey are described below.

Since the programme covers topics such as costs of borrowing¹⁶ and risk management¹⁷, questions on compound interest, understanding of inflation, and understanding of risk diversification are relevant and appropriate measures to assess CARE Rwanda's financial literacy training.

Thus, we adjusted the traditionally used Lusardi and Mitchell questions (2011)¹⁸, which exclusively focus on numeracy skills for calculating financial trade-offs. This approach has been implemented in many surveys internationally and was also adapted in a seminal paper by Cole et al. (2011)¹⁹ for the Indian context. Questions that were asked are the following:

- Suppose you borrow RWF 10,000 from a moneylender at an interest rate of 2% per month, with no repayment for 3 months. After 3 months, do you owe less than RWF 10,200, exactly RWF 10,200, or more than RWF 10,200?

¹⁶ See the financial literacy and linkage training manual, topic 4.2.

¹⁷ See the financial literacy and linkage training manual, topic 6.3.

¹⁸ Lusardi, A., & Mitchell, O. S. (2011). Financial literacy and planning: Implications for retirement wellbeing (No. w17078). *National Bureau of Economic Research*.

¹⁹ Cole, S., Sampson, T., & Zia, B. (2011). Prices or knowledge? What drives demand for financial services in emerging markets?. *The journal of finance*, 66(6), 1933-1967.

- If you have RWF 10,000 in a savings account earning 1% interest per annum, and prices for goods and services rise 2% over a 1-year period, can you buy more than, less than, or the same amount of goods in 1 year as you could today, with the money in the account?
- Is it riskier to plant multiple crops or one crop?
- Suppose you need to borrow RWF 50,000. Two people offer you a loan. One loan requires you to pay back RWF 60,000 in 1 month. The second loan requires you to pay back in 1 month RWF 50,000 plus 15% interest. Which loan represents a better deal for you?

For each question the respondent provides a correct answer for, they receive one point, with a potential maximum of four points available. Thus, the financial literacy indicator ranges from zero to four. Hence, if someone answered all questions correctly, they would achieve a score of four points and is considered financially literate. It should be noted that all questions were multiple choice; two questions with two possible answers and two questions with three possible answers. To avoid potential biases (e.g. "the first option is always right" or "in a true-false I always agree with the sentence saying that it is true"), we used the tablet to randomly rotate the order of given options.

Economic welfare

Economic welfare is often taken as a succinct measure of wellbeing and is expressed in terms of assets and money. Thus, the questionnaire includes questions aimed at gaining data on household assets, such as the compound they live in, the number of animals they own, or their means of transportation.

To understand the extent to which poverty has been reduced, a question is included on households' current *ubudehe* category²⁰, which provides an aggregated estimate of the household's standard of living. To compliment this indicator, we include questions on income sources and income generating activities, which indicate households' potential to generate and grow income as a result of the programme. Due to the sensitivities around and potential misreporting of household income, questions asking the respondent to state the amount of expenses on various categories, such as food, clothes, health expenditures, and medical expenditures are included.

The questionnaire also includes questions aimed at generating insights into risk situations and respondents' risk management. Whether someone is able to protect themselves against economic shocks and unforeseen costs is introduced as one part titled "emergency expenses and consumption". The former is related to emergencies (sickness, death, accident, fire etc.), whereas the latter is related to questions on food security and food production. Finally, questions on food security are included to measure livelihoods and will be used to measure the extent to which poverty has been reduced, as well as changes in the respondent's ability to practise consumption smoothing.

Household decision-making

The survey instrument includes questions that address household decision making. Questions on bargaining power at home with respect to various categories, such as expenditures on food, education, and health are included in the questionnaire. The survey includes questions regarding whether the respondent must ask for permission from a spouse to engage in various activities, such as participation in village meetings, travel to a place outside of their village or joining a group or association. Data were collected for these indicators at both baseline and endline to assess the extent to which the programme resulted in improvements in female empowerment.

²⁰ Traditionally, *ubudehe* was a Rwandan practice where a community would get together to solve a problem. Presently, *ubudehe* is a process where a community collaboratively assigns individuals to a 'category' that signifies their living standard. *Ubudehe* categories are now assigned to all Rwandans and are used as a measure to determine what social support individuals will receive. *Ubudehe* categories are analogous to the Living Standards Measure (LSM) used in other countries.

Subjective wellbeing

The final set of questions included require respondents to provide a self-evaluation of their living conditions. The subjective wellbeing of participants is interrogated by asking how happy they are with their lives. Respondents are asked to indicate how happy they are, using four categories: very happy, rather happy, not very happy, and not at all happy. This question has also been implemented in the seminal World Values Survey.

Life satisfaction is an alternative measure of subjective wellbeing that has been included in the survey questionnaire. This has already been used in many surveys around the world, including the World Values Survey. The question aims to lift the issue of economic wellbeing to other dimensions of human welfare and asks participants whether this upgrade in financial terms also affects other aspects of their lives. Life satisfaction is assessed by asking respondents to indicate how satisfied they were with their life as a whole, using a scale that ranged from one (not at all satisfied) to ten (very satisfied).

Abbott and Wallace (2012)²¹ analyse this indicator for the post-conflict society in Rwanda and find that life satisfaction of Rwandan citizens is relatively low, whereas happiness happens to be much higher. Inglehart et al. (2008)²² use these indicators to create a composite index of subjective wellbeing. For a composite measure of subjective wellbeing, they combined each person's responses to the questions about happiness and life satisfaction to produce an index, giving equal weight to each variable. Because life satisfaction is measured on a ten-point scale and happiness is measured on a four-point scale, and because the two questions have opposite polarity, the composite index was structured as follows: subjective wellbeing = life satisfaction – 2.5 happiness. If 100% of respondents were very happy and extremely satisfied, the index would score the maximum value of 7.5. If happiness and life satisfaction were evenly balanced, the index would be zero. If more were people dissatisfied or unhappy than satisfied or happy, the index could fall into the negative.

These items are sensitive indicators of a broad subjective wellbeing dimension, capturing most of the common variance in scores of domain-specific indicators. These indicators were assessed at both baseline and endline phases of the evaluation to indicate improvements in the quality of life from an emotional and cognitive perspective.

²¹ Abbott, P., & Wallace, C. (2012). Happiness in a post-conflict society: Rwanda. In *Happiness Across Cultures* (pp. 361-376). Springer, Dordrecht.

²² Inglehart, R., Foa, R., Peterson, C., & Welzel, C. (2008). Development, freedom, and rising happiness: A global perspective (1981–2007). *Perspectives on psychological science*, 3(4), 264-285.