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# MICROFINANCE: THE ROAD TO DEVELOPMENT?

Results of an Impact Study – VisionFund Ghana

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## **Abstract**

*This report presents the results of an impact evaluation conducted among the clients of VisionFund Ghana (VFG). The study is based on an approach and (customized IT-based) survey tool developed by Oxfam Novib. This approach involves obtaining impact information directly from clients and includes their perception of changes experienced in key dimensions of poverty, as a result of development interventions, in this case the microfinance products and services of VFG. At the start of the study a Theory of Change was developed, based on the input obtained from VFG. The Theory of Change reveals the expected social and economic impact of microfinance products and services provided by VFG. The expected impact was tested with the help of a -survey conducted among a randomly selected sample of clients and future clients (as a control group). Propensity Score Matching was used to analyze the outcomes of the survey. Evidence was found, that the work of VFG successfully contributed to improved lives of its clients. A positive impact of VFG's clients was observed on livelihoods, vulnerability and coping capacity, and empowerment. Mixed impact is measured regarding education and health and no impact is found on the social and political participation of clients.*

*Key words: Microfinance, Ghana, Impact evaluation, Propensity Score Matching, Theory of Change*

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## List of Acronyms

APED	Association of Progressive Entrepreneurs in Development
BCI	Basic Capabilities Index
GHAMP	Ghana Microfinance Policy
IE	Impact Evaluation
MFI	Microfinance Institution
NN	Nearest Neighbour
PSM	Propensity Score Matching
RCT	Randomized Control Trial
VFG	VisionFund Ghana

# Chapter 1. Introduction

Once I heard a variation on the classic development cooperation story. You should not give a man a fish, but a fishing rod so he can catch fishes himself. In real life however, the man has to walk two hours to reach the river and when he arrives all the fishing rights are already forgiven. Giving him a fishing rod is only a start towards development. To move the discussion towards microfinance, advocates refer to microfinance as the panacea against poverty; critics however, think that microfinance is only the fishing rod and that poor people need much more to walk down the road to development.

This study assesses the impact of microfinance. In this chapter I will first discuss the gap between formal banks and informal lenders and the theoretical need for microfinance. Secondly, I discuss the empirical evidence of microfinance and the need for impact evaluations. Subsequently I give an overview of VisionFund Ghana which is the studied MFI. This results in measuring the social and economic impact of microfinance which is formulated in the problem statement and finally I describe the structure of the report.

## 1.1 Microfinance in theory

Theoretically, microfinance fills the gap between the formal banks and informal lenders. In a simple loan contract, bankers do not offer financial services to non-wealthy people. This is because they face two kinds of problems when they borrow money to them. First, there is the adverse selection problem. This problem arises when bankers cannot determine how risky their borrowers are. They want to raise higher interest rates to risky borrowers than to safer ones. Higher interest rates are charged as compensation for the higher probability of default. However, banks are not able to assess which borrowers are risky and which are not; they are unable to discriminate risky borrowers and charge them a higher interest rate. This means that they have to charge all borrowers a high rate, even the non-risky borrowers (Stiglitz & Weiss, 1981). Further, banks face moral hazard problems. Two types of moral hazard can be distinguished: *ex ante* and *ex post* moral hazard. *Ex ante* refers to the actions of borrowers after the loan is disbursed, but before the investment has taken place. To be able to repay their loan, borrowers have to invest their money in income generating activities. However, clients do not face the consequences when they default and this influences the amount of effort they will put in their investment. Banks, on the other hand face the consequences when clients default but are unable to influence the investment behaviour of their clients. *Ex post* moral hazard refers to enforcement problem of bankers, a situation when bankers are not able to determine whether the borrower made a profit. And, even when the borrower made a profit, he/she can decide to default on the loan (Armendáriz & Morduch, 2010).

Adverse selection and moral hazard problems make that banks face high costs in monitoring their borrowers. Normally banks solve this problem to require collateral. Borrowers need to have collateral which the bank can sell if the borrower defaults. However, poor people normally don't have any valuable asset which can be used as collateral and are therefore excluded from financial services by formal banks (Armendáriz & Morduch, 2010).

Here, informal lenders fill the gap. These informal lenders could be subdivided in friends and family, and commercial moneylenders. Friends and family usually charge lower interest rates, while moneylenders could charge higher rates. Those informal lenders are local people with some capital who lend small amounts of money and keep small savings. They have a close relationship with the borrowers and are therefore better able to monitor their behaviour. However, these moneylenders charge high interest rates, in India sometimes even over 100% on annual basis (Singh, 1968). Siamwalla *et al.* (1990) found lower interest rates in Thailand, around 60% on an annual basis; however, this is still much higher than the rates charged by formal banks in that region (12-14%). These high interest rates are not a strange phenomenon as the costs of moneylenders are relatively high compared to the amount of money they have issued. Besides the high monitoring costs, Braverman and Guasch (1986) calculated that the



administrative costs of small loans is between 25-40% of the loan size. This high administrative costs causes also the low saving and insurance rates of non-wealthy people. The high costs outweigh the profit for formal banks.

Microfinance fills this gap between formal banks and informal lenders by solving the adverse selection and moral hazard problems. Microfinance Institutions introduced group lending to overcome these problems. Group lending implies that individuals have to form a self-selected group before they get a loan. Besides that they are responsible for repaying their own loan, they are also responsible for repayment of the loans of the other members of the group. Because of this, members will monitor each other and risky borrowers are avoided to minimize the default rates. So, MFIs can leave the costly selection and monitoring processes to the clients. Furthermore, MFIs use tools to increase trust between them and clients. Many MFIs have compulsory savings for a certain period before clients receive a loan. Besides these savings, they introduced loan cycles. Borrowers start with a small loan, when they repay on time, they get a bigger loan the next time. The further customers are in the loan cycle, the higher the loan they can obtain (Armendáriz & Morduch, 2010).

MFIs became a formal link between the traditional formal banks and informal lenders. They give non-wealthy people the opportunity to borrow and save money in smaller amounts offered by traditional banks and against lower interest rates offered by moneylenders. This would enable non-wealthy people to make a profit and consequently escape poverty.

Empirical evidence is needed to test this hypothesis. Many impact evaluations regarding microfinance from varying quality has been executed in the last thirty years. Additional, complex social environments decreases external validity, and this demands further research to the impact of microfinance. This study contributes to the debate through assessing the impact of microfinance based on the findings from VisionFund Ghana, a MFI in Ghana.

## 1.2 Microfinance in Ghana

Although microfinance is a relative new term in Ghana, the concept has been known for a longer period. The informal Susu system, invented in Nigeria, spread over Ghana since 1900 and is similar to the microfinance concept used nowadays. This system was invented because women missed the opportunity to save money to use it in the future. In the villages, a person who was trusted collected savings every day from households which wanted to save. The saved money was used for lending purposes and some interest was raised on the loans (Nanor, 2008). In this way, the Susu system worked as a small bank. The microfinance system evolved out of this Susu system. MFIs gave poor people the opportunity to borrow and save small amounts of money. Banks did not offer small amounts of money because due to relative high transaction costs, these loans and savings were not profitable for them. This need for a formal institution which offers financial services to non-wealthy people is seen all over the world.

Several programs and government regulations led to the growth of the microfinance sector in Ghana. In 1991, the Ghana government liberalized the financial market, so non-banking financial institutions were able to settle in Ghana (Nanor, 2008). Within this liberalization of the financial market, a National Strategic Framework was implemented to improve the delivery of financial services to medium and small enterprises (Steel, 2003).

A few years later a whole new instrument was created to improve the outreach, sustainability, and efficiency of microfinance services, called Ghana Microfinance Policy (GHAMP). The purpose of GHAMP is promotion of microfinance services and poverty reduction. According to this policy, microfinance is a powerful tool for poverty reduction and economic development, although it is not a silver bullet. The development of microfinance helps to build a sustainable financial framework which serves non-wealthy people. Due to microfinance the active poor and vulnerable citizens would be able to fill the financial gap. Finally, microfinance would be able to empower women (GHAMP, 2006).

According to GHAMP, MFIs should work together to create a sustainable microfinance sector. GHAMP develops training programmes to make MFIs more efficient, sustainable, and coherent. GHAMP expects from MFIs that they create training programs for the determined focus groups: women, disabled people, and the youth (Nanor, 2008). This means that besides financial services, the government of Ghana also focuses on capacity building of both MFIs and non-wealthy people.

In the end, the non-wealthy people of Ghana should benefit from the microfinance services. To protect the vulnerable non-wealthy people, GHAMP creates some minimum requirements that MFIs should meet. This includes transparency of their operations and avoiding of usurious interest rates. Also, MFIs are requested to implement some research, monitoring, and evaluating programs in their organization. GHAMP encourage MFIs to collaborate with universities to increase outreach and sustainability of their services (Nanor, 2008).

### 1.3 VisionFund Ghana

This study was carried out among clients of VisionFund Ghana (VFG), formally known as APED. VFG is a microfinance institution which has been working with World Vision Ghana in providing microfinance services to the rural poor entrepreneurs since 2001. VFG's social mission is to give each productive person living in poverty opportunities to provide a better livelihood for themselves and their families. This is attempted through the development of sustainable micro-enterprises owned primarily by women and to promote justice. In addition they proclaim the Kingdom of God. VFG focuses on three client groups: poor people, people in rural areas, and women. Potential clients have to meet the following requirements: i) work fulltime; ii) have at least six months of experience in doing business in a sector that does no harm to human beings and the environment. VFG offers its clients both financial and non-financial products. The financial products include loans, savings and insurance, while the non-financial products include training courses on business development and agricultural extension. As of September 2013, VFG has 17.733 clients for a total outstanding portfolio of about US\$ 2.4 million.

Table 1: Performance indicators of VFG

Indicator	VISIONFUND GHANA PERFORMANCE INDICATORS FY06-FY13							
	Sep-06	Sep-07	Sep-08	Sep-09	Sep-10	Sep-11	Sep-12	Sep-13
Clients	11,086	15,569	18,796	9,038	8,258	11,050	13,495	17,733
% Women	75	76	79	80	79	81	77	78
% Clients in Rural areas	93	93	96	98	98	98	90	90
Loan Portfolio (\$) '000	1,100	1,900	1,600	1,000	1,000	1,600	2,070	2,400
Loan Loss Rate (%)	1.9	2.6	24.5	18	8.7	1.0	1.0	1.7
Total Revenue '000	524	944	1,215	787	754	964	1,407	1,683

Source: VFG (2014)

VFG's main product is credit for the productive poor, in the form of Working Capital Loans through groups known as community banks. The loans are generally not collateralized, but a system of collateral provided by peers is developed to ensure that loans are guaranteed by group members collectively. The credit is meant to help expand the business of the small entrepreneur who does not have access to credit from commercial banks. The loan size increases progressively in the so-called product cycle, depending on the repayment rate and the business's capital needs. Clients are charged an interest rate of 42-60% a year, and pay a processing fee of 3% of the loan amount. The interest rate that is charged depends on the client's loan cycle, the nature and location of the business, and the interest rates charged by competitors. This interest rate is between the rate of the Bank of Ghana and moneylenders. The Bank of Ghana charges a rate around 16% on an annual basis (Bank of Ghana, 2014). Interest

rates among informal lenders vary widely from zero to over 100% on an annual basis. Aryeetey *et al.* (1997) found that moneylenders set their interest rates on average at least 50% higher than formal rates, which in this case is 66% or higher. Further, loan sizes of VFG vary from \$20 to \$3,000 and are given for a period of 4 to 12 months. The loan amount issued and repayment period defined by VFG also depends on the borrower's loan cycle and business activity.

Although loans are VFG's main product, savings are recognized as an important by-product. According to VFG, savings make clients more independent. As with loans, VFG wants to give its clients access to a formal way of saving. Moreover, it is also mandated that a percentage of the loan should be held as savings by clients. Clients have the option also to save voluntarily, in addition to the mandatory savings.

Furthermore, VFG provides micro-insurance to clients in co-operation with MicroEnsure. MicroEnsure is an organization that exclusively focuses on mitigating risk for the mass-market. They provide insurances for poor people mostly in Africa. The insurance provide funds for clients in case of a natural disaster or fire, or in the unfortunately event of the death of a client.

## 1.4 Impact evaluations in Ghana

Two good quality studies measured the impact of microfinance in Ghana. Adjei *et al.* (2009) measured the impact of the services provided by the MFI Sinapi Aba Trust on poverty reduction and asset building. According to that study the services of Sinapi Aba Trust enables participants to own a savings account and increases participation in insurance schemes. Further, positive effects are measured regarding health, education, and households spend more on durable goods. Nanor (2008) also found a positive impact of microfinance on education. This study focused on four districts in eastern Ghana. In two of the regions positive impact on income is measured, while in the other districts no impact is found. Chapter three elaborates more on the existing literature regarding the impact of microfinance.

## 1.5 Study Objective

In theory microfinance fills the gap between formal banks and informal lenders. In this study I measure if microfinance is really able to serve the non-wealthy and improve their wellbeing. This improvement in wellbeing is measured based on the social and economic impact of microfinance and contributes to the ongoing debate about the impact of microfinance. This impact evaluation measures the achieved changes in the lives of people. In particular, this report answers the question: *what is the social and economic impact at the client level of the services provided by VisionFund Ghana?*

## 1.6 Structure of the report

The next chapter focuses on the Theory of Change on which the assumptions are built to determine the impact of microfinance. Chapter three gives an overview of the impact evaluations implemented in the field of microfinance, followed by the methods used in this study in chapter four. Chapter five shows the results of this impact evaluation and subsequently chapter six reveals the conclusions and discussion of this paper. Finally chapter seven gives recommendations for further research.

## Chapter 2. Theory of Change

To explain the changes in the lives of the beneficiaries because of the intervention, a theory of change is used. A Theory of Change is an approach to navigate in the complexity of social change processes (Eguren, 2011). This is done by making our assumptions explicit and by analysing them critically.

This study uses a multidimensional approach to impact, and is based on the assumption that different factors determine poverty beyond income. This multidimensional approach is based on the Universal Declaration of Human Rights. The Universal Declaration assumes that every human being has inalienable rights and that poverty and exclusion are a violation of these universally recognized basic rights, which are:

1. the right to a sustainable livelihood
2. the right to essential social services (health and education)
3. the right to life and security
4. the right to be heard
5. the right to an identity (Oxfam, 2013)

The impact domains used in this study are deduced from these five – interconnected – basic human rights. The impact domains can be classified in an economic and a social dimension. Each domain was translated to indicators, variables and questions. The questions to measure the impact on these five rights are based on various international standards and indices, such as the social welfare index of Social Watch and the multidimensional poverty index developed by the UNDP. Table 2 provides an overview of the different impact domains used in this study.

Table 2: Impact domains

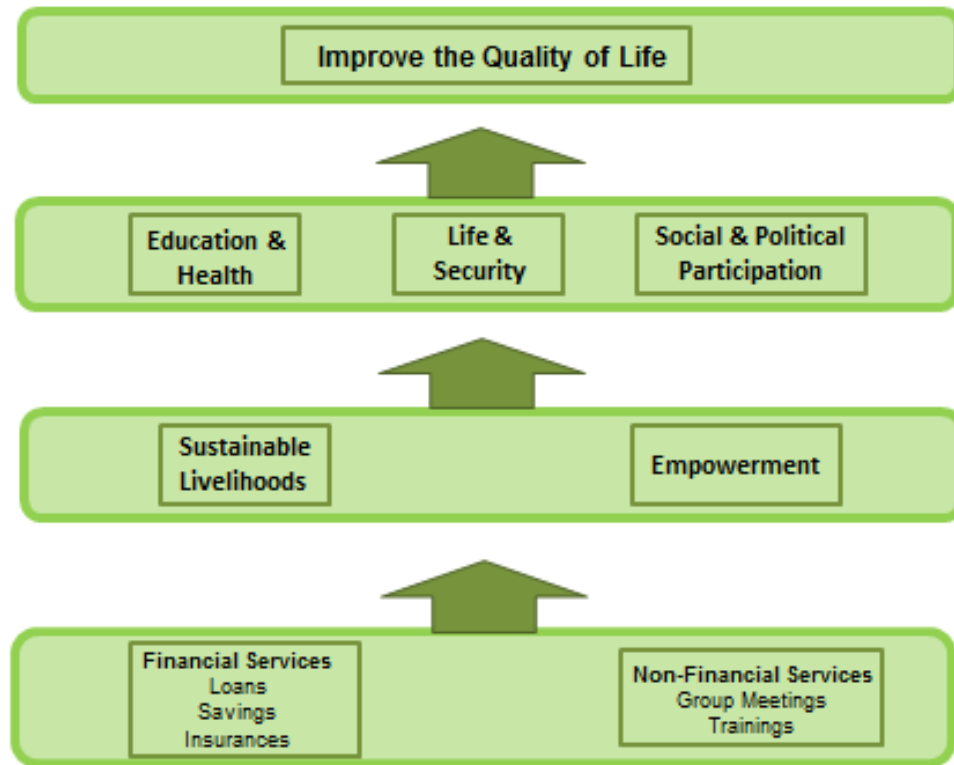
Impact dimension:	Basic rights:	Impact domains:
<b>Economic</b>	Right to sustainable livelihood	Perceived change in income & savings
		Ownership of assets
		Living standards
		Food security & meals a day
<b>Social</b>	Right to essential services	Education
		Health
	Right to life and security	Vulnerability
		Resilience & coping capacity
	Right to be heard	Social and political participation
Right to an identity	Empowerment	
	Reproductive rights	

### 2.1 Impact Chain

The impact chain of microfinance follows several steps as is shown in figure 1. The microfinance services provided by the MFI contain financial services like loans, savings, and insurance and non-financial services like group meetings and business trainings. These financial services help clients to manage their risk. Access to credit and savings could smooth their consumption and therefore reduces the necessity for household to diversify income. Households could focus on risky and higher income labour to improve their average income (Zeller *et al.*, 2002). In addition, microfinance aims at women, makes them feel more confident and include them in the decision-making process (Armendáriz & Morduch, 2010). In short, these services of the MFI influence positively the domains in the rights sustainable livelihoods and empowerment. Subsequently, the increased wealth of households combined with the improved empowerment of women; increase their demand for education and health services. Moreover, increased wealth increases their coping capacity and reduces their vulnerability (Armendáriz & Morduch, 2010). And, higher empowerment rates make clients more active in social and

political participation (Hulme, 2000). Finally, the improvement of these basic rights will improve the quality of life of clients.

Figure 1: Impact chain of microfinance



From this impact chain I decided which impact indicators are relevant to include in the questionnaire. This study is based on the following set of assumptions regarding the expected and intended benefits from financial inclusion:

The services of VFG open a world of opportunities to its clients; opportunities the formal financial sector denied them. Loans enable them to buy tools and materials to start an income generating business and/or to increase the productivity of an existing business. This opportunity **increases their income and savings**, which allow them to **accumulate assets and resources** (de Mel *et al.*, 2008). In addition, the income generated from these businesses allows them to pay school fees to **educate** their children (Hietalahti & Linden, 2006), stabilize **food** sources (FAO, 1996; Maxwell *et al.*, 1999) and pay for other expenses that lead to the improvement of the **health** and wellbeing of their families (Dupas & Robinson, 2009). Low-income families can use credit and savings to tap into past or future income, helping them to both take advantage of immediate opportunities and, for example, to survive periods of food insecurity.

Poor people do not only have low incomes but are also vulnerable to disasters and uncertainties. The **lack of preparedness** or **coping capacity** may result in a slower response to a disaster, leading to a greater loss of life or prolonged suffering (Armendáriz & Morduch, 2010). They also often lack reserves in times of need or buffers to absorb the shocks of income losses. Savings, credit and insurance provide sustainable and low-cost coping strategies, increasing people's **resilience to future disasters**. Saving accounts – equally critical financial tools – facilitate the safe accumulation of assets, while micro-insurance **reduces people's vulnerability to risk** (Hietalahti & Linden, 2006). Together these services help poor people to improve their lives and begin to work their way out of poverty. If a household loses a source of income, it might not have to **withdraw a child from school** (UNICEF, 1997), sell a valuable asset, or fall deeper into poverty.

Microfinance is particularly able to **empower women** (Afrane, 2002; Hashemi *et al.*, 1996). It gives them access to materials and the human and social capital necessary for making strategic choices in their lives: it establishes or strengthens financial independence; transforms power relationships; **strengthens reproductive rights** (Schuler *et al.*, 1997); improves stability and family prospects by directing more income to families; and, particularly, **engenders self-esteem** and pride (Yunus, 1999). This economic independence often translates into more productive communities (Khandker, 2005). In addition, financial services foster independence. Microfinance can help clients to grow more **self-confident** and, with **economic empowerment**, to step out and **participate in local government and social organizations**, commanding the respect of their communities (Hulme, 2000; Kabeer, 2005).

Throughout this study emphasis is put on the expected impact areas mentioned in the Theory of Change (in bold). Based on these expected impact areas the questionnaire was composed and in the following sections I will analyse the results per basic right.

## 2.2 Impact indicators

This multidimensional approach explains how the microfinance services impact the quality of life of the beneficiaries. From the five basic rights I formulated several impact domains as shown in figure 1. Subsequently, the impact of microfinance on the different indicators is described. The following sections elaborate on these indicators and describe what they imply and what I calculated exactly.

### 2.2.1 Right 1: Sustainable Livelihoods

Sustainable livelihoods is the economic impact domain. It measures the impact of microfinance on financial outcomes like income and asset accumulation. This study does not use income data to measure the livelihood of households. Income data has limitations in both accuracy and measurement. For instance, for people living in informal labour markets incomes are often highly variable. Income can be seasonable, such as when earned from farming or tourism, or just variable and lumpy for small-business owners (Moser & Felton, 2007). Taking a snapshot of income at one point in time may therefore produce a less reliable picture of those types of workers than those who receive regular salaries. Furthermore, they may be engaged in barter and other non-monetary forms of trade. In all these cases there is a high potential for error in data based on the recollection and value of all sources of income.

Many microfinance impact studies use expenditure as a proxy for income (Banerjee *et al.*, 2009; Dupas & Robinson, 2009; Karlan & Zinman, 2011). This type of measurement has the advantage of reliability. Measuring expenditure over a certain period of time minimizes the bias in the outcomes. However, in this study I use the perceived change in income or savings as indicators. These indicators have the advantage of clarity. Income and savings are recognizable for most people and therefore useful indicators. However, the disadvantage is that these indicators could show subjective outcomes. Clients could overestimate their income when they put it in context. They could easier think that the microfinance intervention influenced their income and savings than it actually does. Supporters of perceived change indicators argue that it does not really matter whether clients really increased their income. The feeling that they increased their income is a positive effect on itself.

The **perceived change in income** is defined as the monetary income received in a particular period from various sources (work, interest, remittances, gifts, etc.). This is measured by asking the respondents if they had observed an increase, decrease or no change in their income over the past 12 months.

The **perceived change in savings** is also used to measure the impact of microfinance on the livelihoods of clients. The indicators is measured by asking respondents with savings if they had observed an increase, decrease, or no change in the income over the past 12 months. This

indicator is included as it provides information on the extent to which people have had experienced a surplus or shortage on their financial resources.

The **Assets Index** is a quantitative indicator of households' assets ownership. The composed Assets Index is a non-weighted index in which the following household assets are included: radio; bicycle; bed frame with mattress; refrigerator; television; computer/laptop; mobile phone; fishing net; tri-cycle; motorcycle; donkey/bullock; tractor; car/pick-up truck; or other items with value of more than 1000 Ghana Cedi (40\$). This means that I simply sum up the number of assets owned, which is equivalent to setting asset = 1 for each asset. This method has the virtue of simplicity, but also has the limitation of assigning equal weight to ownership of each asset. For example, this method would assign equivalent values to owning a radio and a computer, although in reality their contributions to the capital variable are surely different.

The **living standards** or quality of housing indicator is also included to measure wellbeing. The quality of housing is measured with a Housing Index indicator that includes (1) access to safe drinking water; (2) electricity; (3) concrete floor; (4) flush toilet; (5) cooking fuel; and (6) solar lightning. Likewise the Assets Index, the Housing Index is a non-weighted index whereby I simply add up the number of assets owned with a maximum score of 6. These indicators are based on the multidimensional poverty index developed by Oxford Poverty & Human Development Initiative and the United Nations Development Program (Alkire *et al.*, 2012).

**Food security** refers to “a situation when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life” (FAO, 1996). Food security is measured using an “insufficient food intake”, which means that the respondent or his or her household members cut the size of their meals or skip meals once or more often because there was not enough in the last 3 months. A second variable related to food security is the **number of meals** consumed per day. Although this variable does not show whether the quality of the food and the diet have changed, it is assumed that it is still a meaningful indicator of food security (Maxwell *et al.*, 1999).

### 2.2.2 Right 2: Essential Services: Education and Health

Essential services are defined by two indicators; **education** and **health**. Based on the Basic Capabilities Index developed by Social Watch<sup>1</sup>, Oxfam Novib used two sub-indicators to measure education; percentage of school-age children (girls and boys) **enrolled at school** and percentage of school-age children who started school and **dropped out** before reaching grade 3. The indicators used for health were the same as those used by Social Watch, i.e. percentage of **deliveries attended by skilled personnel**, and **mortality rate of children under 5 years of age**. This study also included the number of days that people were so **ill** they were unable to work over the last three months.

### 2.2.3 Right 3: Life and Security

The degree to which people fall victim to serious physical damage and perceive a threat to their physical integrity and/or personal belongings is a good indicators of their **vulnerability**. In this study I have defined 5 threats that may have caused a negative impact or physical damage to the respondent or household members: banditry, state action, civil unrest or armed conflict, natural disaster, discrimination.

Being prepared for emergencies (taking any measures to cope with potential disasters in the future) is an indicator of **resilience** and the capacity to prevent external shocks from causing social and economic deterioration.

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<sup>1</sup> For more details about social watch and the construction of the BCI see <http://www.socialwatch.org/>

**Coping capacity** is measured as the level of confidence people have in their ability to cope with potential threats (banditry, state action, civil unrest or armed conflict, natural disaster, discrimination) in the future.

#### 2.2.4 Right 4: Social and Political Participation

Social organizations are a key player in the field of government-private sector-civil society, especially in ensuring respect of people's rights. Civil society organizations are important in ensuring that the rights of marginalized people are respected. Furthermore, an important indicator of empowerment is participation in organizations and decision-making power. Another important indicator for measuring decision-making power is leadership positions held by project respondents. The empowerment and participation dimension thus intends to measure the degree of social and political empowerment.

I used several types of organizations that are common in the society. This includes: religious organization, community organization, sports club, school organization, women's organization, political party, trade union, farmers organization, and other. I weighed all the different organizations equally, because I think that membership in itself is the most important indicator of participation.

#### 2.2.5 Right 5: Identity

The identity indicators measure to what extent women were involved in the decision-making process. In more traditional communities, where men often head the household, the decision-making process is carried out by the men only. I believe that decision-making should not be the exclusive preserve of men, but that women should also be involved. I therefore give high scores to households where women are involved in the decision-making process, and give low scores to households where exclusively men have decision-making power.

I examined these outcomes on three different topics: household spending, family planning, and contraceptives. **Household expenditure** is about how the household's income is spent on different products and services. Men and women have different views on household spending, so the design of the decision-making process influences the kind of products and services that are bought. The second indicator is empowerment in family planning. **Family planning** depends on cultural values and personal ideas. The extent to which women are involved in the decision-making process determines how their personal ideas are included in the decision made. In more traditional societies decisions are made by men, the head of the household. I consider it important that women are also involved in the decision making process. The third indicator is about the use of **contraceptives**. This indicator also depends on cultural values and personal ideas. Contraceptives can even be more culturally charged than family planning and therefore this indicator shows the degree of empowerment.



## Chapter 3. Overview of Microfinance Impact Evaluations

In recent years development organizations face more and more pressure to prove that their programs have impact. Or in other terms, that development programs work. Microfinance is herein not an exception. For a long time microfinance has been seen as the silver bullet to ban poverty to the museum. Especially microcredit has been considered as a powerful instrument to alleviate poverty (Robinson, 2001; Yunus, 1999). Besides credit, microfinance provides other financial services like savings and insurance and non-financial services like trainings and meetings. In the last 30 years several impact studies from varying quality assessed the impact of microfinance. These studies were not able to draw a clear conclusion on the question if microfinance has impact on the lives of poor people.

Advocates of microfinance appoint that poor people (those who earn less than \$2 a day) improve their health, education, empowerment, and food security (Afrane, 2002; Barnes & Keogh, 1999; Odell, 2010). However, other impact evaluations show less positive or mixed results. Some evaluations note that there is a trade-off between outreach and sustainability. The more clients a MFI wants to reach, the less sustainable the MFI is (Hermes & Lensink, 2011). Others argue that only the poor are reached but not the poorest of the poor. Due to high transaction costs, MFIs gain a higher profit when they focus on poor people who are close to the poverty line and leave the poorest apart (Mosley & Hulme, 1998; Zaman, 1999).

The mixed outcomes of these evaluations opened the debate about the impact of microfinance, which resulted in some high quality impact studies. In this chapter, I will give an overview of the most important impact studies in the field of microfinance. These studies include randomized control trials, pipeline studies, and with and without studies. Duvendack *et al.* (2011) give a good overview of the internal validity of these studies. Randomized control trials have the highest internal validity, followed by pipeline studies, and with and without studies.

### 3.1 Randomized control Trials

Randomized control trials (RCTs) became highly popular at the end of the first decade of the 21<sup>st</sup> century in the field of microfinance. Especially the study of Banerjee *et al.* (2009) generated much discussion in the microfinance world. In their extended version of 2013, Banerjee *et al.* (2013) discussed a new end line. The end line of their first study was after fifteen to eighteen months, while the second end line was after three to four years from the initial start. Further, they compared their outcomes with similar studies executed during the last years. This paper contributed a lot to the external validity of RCTs in the field of microfinance. However, still only a few studies are executed. The findings of these studies are discussed below.

There is no evidence found that microfinance increases the expenditure of households significantly (Banerjee *et al.*, 2009; Dupas & Robinson, 2009; Karlan & Zinman, 2011). Although expenditure of clients did not increase, households with access to microfinance spend their money more on durable goods and less on temptation goods (Angelucci *et al.*, 2013; Augsburg *et al.*, 2012; Banerjee *et al.*, 2009). This means that households reallocate their income and especially for poor households this could improve their wellbeing, because they face high fluctuations in their income over the year. Further, households invest more on their business and generate more revenues (Angelucci *et al.*, 2013; Augsburg *et al.*, 2012). Even though financial outcomes do not show clear positive impact, borrowers were better able to cope with risk, enhanced their community ties, and were more capable to access informal credit in their community (Karlan & Zinman, 2011). Empowerment figures show mixed results, Banerjee *et al.* (2009) and Crépon *et al.* (2011) found no impact on empowerment, while Angelucci *et al.* (2013) found that women increased their decision-making power. Banerjee *et al.* (2013) found at their first end line no impact on enrolment, however, their second end line show increased expenditure on education. Crépon *et al.* (2011) suggest a positive impact on enrolment, while

Augsburg *et al.* (2012) found lower enrolment rates. Impact on health show also mixed results, Banerjee *et al.* (2013) show a decrease in health expenditure at their second end line, and Crépon *et al.* (2011) found an increase in health expenditure.

Doing business is risky and the returns will fluctuate. Entrepreneurs will invest their money and then wait until those investments will yield a return. However, microfinance programs hold a strict regulation of repayment. Mostly, clients have to start repaying their loan from the first week onwards. The income generated from the business is not sufficient to repay the loan, so often clients reserve some money from the beginning to be able to repay the first instalments of the loan. In addition, they avoid business opportunities which show a return in the long run (Bauchet *et al.*, 2011).

Further, microfinance focuses on risk-averse people. High repayment rates and frequency of repayments are of the utmost importance of MFIs. These two factors determine the return they receive from their investments. However, growing a business is a risky business with uncertain returns. Often this means that MFIs and clients have contradicting interests (Armendáriz & Morduch, 2010).

## 3.2 Other Impact Studies

As discussed above, only a few RCTs are implemented in the field of microfinance. Therefore impact studies which used other methods will be discussed to give a broader view of the literature. Those methods include pipeline studies and with and without studies. In contrast to randomized studies, many impact studies which use pipeline or with and without methodologies have been executed. In this study I used the literature review in the study of van Rooyen *et al.* (2012) to decide which studies are of sufficient quality to incorporate in the literature overview.

### 3.2.1 Impact of microfinance on economic outcomes

Economic outcomes include income, savings, asset accumulation, and housing. The impact of microfinance on income shows mixed results. Ashraf *et al.* (2009) and Barnes *et al.* (2001) found an increase in business and household income, while Nanor (2008) suggest mixed results regarding income. Although not many studies measured the impact on savings, both micro-credit and micro-savings increase the saving levels of poor people. In addition, the studies suggest that micro-credit and micro-savings increase the accumulation of assets (van Rooyen *et al.*, 2012). However, the accumulation of assets is mostly in the initial phase and does not continue over time (Adjei *et al.*, 2009; Brannen, 2010). Furthermore, microfinance impacts the housing of participants positively. Participants invest more in their houses (Brannen, 2010) and own more often their own house (Barnes *et al.*, 2001; Brannen, 2010) than control groups.

### 3.2.2 Impact of microfinance on social outcomes

The social indicators include education, health, resilience capacity, and empowerment. The impact measured on education is contradicting, which means that some studies suggest positive and others negative impact. Adjei *et al.* (2009) make clear that micro-credit increases household expenditures on education. However, participants of micro-credit programmes fail to increase their expenditures on education over a longer period of time. Moreover, enrolment levels of children even decrease over time.

The accessed studies state that microfinance has a positive influence on health of poor people. This holds for the indicators as the number of days that people were not able to work due to sickness, the number of different instances of sickness, and nutrition (van Rooyen *et al.*, 2012). Further, expenditure on health care rose (Adjei *et al.*, 2009; Brannen, 2010; Dupas & Robinson, 2009). Microfinance has however no impact on the number of meals poor people consume a day. This holds for micro-credit (Doocy *et al.*, 2005) and micro-credit and micro-savings programmes (Brannen, 2010).

There is some evidence that microfinance improves empowerment of women, although those studies are unconvincing. This is mostly due to difficulties in measuring the empowerment within a complex social environment. Many studies show small or not significant impact. However, according to Lakwo (2006), microfinance increases the rate to which women have knowledge about financial management and they own more often a bank account. In addition, participants were more pride because they earn an income for their household.

### 3.3 Conclusions

In theory, microfinance gives poor people access to finance so they can start a business and escape poverty. In practise, microfinance impacts evaluations show mixed results. In the discussed papers, positive impact of microfinance is found on housing, health, food security, and nutrition. On the other hand, mixed outcomes are measured regarding income and education. And although some evidence is found that microfinance empowers women, this is not consistent in all studies. This means that microfinance is definitely not a silver bullet to eliminate poverty. The success of microfinance mainly depends on the context in which microfinance institutions are operating. Further, the complexity of poverty combined with the various ways of implementation of microfinance services, makes it hard to generalize some conclusions.

## Chapter 4. Methodology

Impact evaluations could be carried out in several ways. As seen in chapter three, several methods are used to assess the impact of microfinance. This chapter describes the necessity of impact evaluations and the methods used in this study.

### 4.1 Impact evaluation

An impact evaluation is needed to help policy-makers decide if interventions are generating the intended effects for the beneficiaries; to promote accountability in the allocation of resources across programs, projects and activities; and to fill gaps in understanding how measured changes in wellbeing can be attributed to a particular intervention.

An impact evaluation is a method to understand whether an intervention actually worked. *“Impact evaluations assess the difference in the values of key variables between the outcomes on ‘agents’ (individuals, enterprises, households, populations, policymakers, etc.) which have experienced an intervention against the values of those variables that would have occurred had there been no intervention”* (Hulme, 2000:8). Assessed are the intended and unintended effects, the negative and positive effects, and the long-term and short-term effects (Wainwright, 2002).

### 4.2 Problem of the counterfactual

Impact evaluation studies can be conducted using quantitative methods (numerical data) or qualitative methods (i.e. in-depth interviews and focus group discussions) before (*ex ante*) or after (*ex post*) an intervention. The main challenge in different types of impact evaluations is to find a good counterfactual – the situation a particular subject would be in had he or she not been exposed to the intervention (Hulme, 2000; Karlan, 2001; Khandker *et al.*, 2010). You must therefore determine what would have happened to the beneficiaries had the intervention not existed. However, it is not possible to study an individual twice in the same time frame, with and without the intervention.

Without information on the counterfactual, the next best alternative is to compare the outcomes of participating respondents with those of a comparison group that did not participate. In doing so, it is important to select a control group that is very similar to the beneficiary group; such that the beneficiaries would have had outcomes similar to those in the control group in absence of inclusion in the intervention. To prevent a bias in the outcomes, the selected control group should be (1) identical to the beneficiary group, (2) if they received the intervention, respond to the intervention in a similar way as the beneficiary group, and (3) be exposed to the same set of externalities as the beneficiary group (Karlan, 2001; Lensink, forthcoming).

### 4.3 Quantitative approach

This study uses a quantitative *ex post* impact evaluation method. Quantitative research tries to find causal relations between different variables in the research environment (Ellis, 2000; Scrimshaw, 1990). Qualitative methods on their own cannot assess outcomes against relevant alternatives or counterfactual outcomes. This means that qualitative methods cannot really indicate what might have happened in the absence of the intervention. An important advantage of quantitative evaluations is that they have immediate benefits and reflect reality. However, these evaluations sometimes miss the mechanism underlying the interventions' impact, which can be very useful in understanding the effectiveness of the interventions (Khandker *et al.*, 2010). For this reason, a mixture of quantitative and qualitative methods will result in the most reliable analysis. This research focuses on a quantitative approach because of cost and time constraints.

## 4.4 Sampling

In order to obtain meaningful results, it is important to implement the sampling process properly. The sample should be adequate to warrant generalization of the findings to the target population (representativeness of the clientele) and minimize this risk of outcome biases. It is therefore crucial to ensure that answers to the questions are given by a sufficient number of subjects (beneficiaries) and that there is no bias in the selection of respondents.

To assess the impact of microfinance over 3 to 5 years, I have defined “people who become a client of VGF between August 2008 and August 2010” as the target population. The sampling procedure included four measures for composing a valid sample and minimizing biases in the sample selection:

**(1)** *A control group has been selected to overcome the problem of the counterfactual;*

**(2)** *The characteristics of the people in the target group and the control group are similar to each other.* The control group consists of people who are registered at VGF as future clients, who had recently passed the selection procedure for receiving a loan in the near future. By composing the control group in this way I prevent any selection bias towards more entrepreneurial people who want to make use of microfinance services (Barnes & Keogh, 1999). “Those (people) who participate in microfinance programs are more entrepreneurial in spirit, more resourceful in business, and hence more likely to overcome life’s problems one way or another” (Karlán, 2001);

**(3)** *Respondents are selected using multistage and simple random sampling.* In multistage sampling method the population is divided into different groups, in this case regions. Twelve regions (Agourai, Timahdit, Meknes, Boufakrane, Azrou, Ain Taoujdate, El Hajeb, Fes, Kenitra, Rabat, Sale, and Temara Hay Nahda) are selected. Within these regions, simple random sampling is used to select the respondents for the target and control group, using a random number generator so that each person in the selected regions had the same probability of being selected for the sample. The multistage sampling method was used to reduce costs of the survey and to shorten the time needed to collect the data. A simple random sample minimizes outcome biases. The sample of the target group was selected from a list of all clients receiving a loan between August 2008 and August 2010. The sample of the control group was selected from a list of all future clients who probably will receive a loan in the future;

**(4)** *Dropouts are included in the target group sample.* The target group consists of all people who became a client of VGF between August 2008 and August 2010 including dropouts. Dropouts are the people who became client between August 2008 and August 2010 but are no longer clients. By including dropouts, I control for the incomplete sample bias, since dropouts presumably were effected differently, and potentially worse, from those who are still clients (Karlán, 2001). Moreover, including dropouts controls for the likelihood that there will be also dropouts among the future clients.

## 4.5 Sample size

This study is based on a sample size of 496 respondents. In order to create maximum statistical power I have selected almost the same number of respondents in the target group and control group: of the 496 respondents 246 participants were from the target group and 250 participants were from the control group. The size of the sample influences the probability to find statistical significant differences between the target group and the control group. The sample size is a trade-off between statistical power and cost-efficiency. In research executed in a new field it is often difficult to determine the correct sample size, because the outcomes will be unknown. To reach maximum statistical power within the given budget I chose for a sample size of 496 respondents.

In addition, power calculations are carried out on the indicators without a significant difference between the target group and the control group. These power calculations show the sample

size needed to find a significant difference at the 5 percent confidence level of 10 percent between the target group and the control group. There could be two causes for not significant differences. First, the fluctuations measured in the outcomes are high and a larger sample size is needed to find a significant impact. Second, it is not possible to measure impact. This could be because the question is incorrectly formulated, or there is no impact because of the intervention.

## 4.6 Data collection

In order to assure the high quality and reliability of data I have developed a questionnaire with primarily multiple choice questions. Multiple choice questions eliminate subjective interpretations of the collected data. An app is used to collect the data on a smartphone or tablet. The use of an app is a cost-efficient way of processing data and contributes to more reliable information. In the app a few quality checks are built to lower the risk of making mistakes.

The interviews were conducted by 10 local loan officers. Appointing local loan officers as interviewers had the advantage that they could verify the answers with reference to the local context. Clients would therefore be more inclined to provide truthful information. Further, local loan interviewers do not face language barriers. Detrimental was the risk that clients give socially desirable answers to gain a positive treatment from VGF in the future. In addition, to gain more reliable answers, Oxfam Novib hired a local consultant to do quality checks during the fieldwork. For example, the consultant checked if the questions were asked in a consistent way and if the answers were interpreted correctly.

The local consultant trained the interviewers how to do a good interview. During the extensive training all interviewers received a tailor-made guideline with explanatory notes for each question; regarding the interpretation of the response categories, tone of voice, and instructions on how to deal with potential sensitivities. The training and guideline contributed to a homogeneous and reliable process of data collection.

## 4.7 Data analysis

### 4.7.1 Data cleaning

Before I started analysing the data I did some quality checks by crosschecking different answers to verify if values were realistic when compared to other questions. In case of an unrealistic answer (e.g. the number of children who left school is higher than the total number of children in a household) I have not included the answer in the analyses. In addition, I have aggregated some data to create more meaningful variables. I have composed various indices as a quantitative indicator for a number of impact indicators. The composed indices are non-weighted indices, except the indicator about social and political participation. For the non-weighted indices I simply sum up the scores on different indicators. This method has the virtue of simplicity, but also has the limitation of assigning equal weight to all indicators. The statistical program STATA was used to make the calculations.

To assess the impact of microfinance, the control group should not receive microfinance services. I have therefore used future clients of VGF as the control group (see section Sampling). However, after the first data analysis on financial characteristics I found that a few members of the control group made use of the financial services of MFIs other than VGF. To make sure that this study measures the impact of microfinance, I have excluded these respondents from the impact analysis. This reduced the size of the control group by 38 respondents.

#### 4.7.2 Pearson's chi-square test and the t-test

The first step in our data analysis was to test to what extent the target group and control group were similar with regard to their general characteristics. I used the *chi-square test* and the *t-test* to see if they differed significantly.

The chi-square test is shorthand for Pearson's chi-square test. The chi-square test was used to compare the observed and expected results on nominal variables (frequencies) and sees if a difference is due to chance, or more significant (Fisher, 1922). Alongside the chi-square test, I also used the t-test to compare the outcomes on interval and ratio variables. The t-test can be used to test different hypotheses. In our research I used the t-test to test whether the means of two independent variables differ significantly from each other (Field & Hole, 2003).

#### 4.7.3 Propensity Score Matching

Based on the *chi-square test* and the *t-test* I concluded that the control group differs from the target group in terms of gender and location (see table 4). To overcome this problem, I used the Propensity Score Matching (PSM) method. With PSM, I try to develop a counterfactual or control group that is as similar as possible to the target group in terms of *general (or observable)* characteristics. The idea is to find individuals in a large group of nonparticipants who are *observationally similar* to participants in terms of characteristics not affected by the program (they can include pre-program characteristics, because those clearly are not affected by subsequent program participation). Each participant is matched with an observationally similar non-participant. In this study the following general characteristics are used to match the control group with the target group: sex, level of education, location of household (urban/rural), marital status, and literacy. This means that for example a highly educated, literate, married woman living in a city that is part of the target group will be compared with a woman in the control group who has the same characteristics. In the same way, each participant is matched with an observationally similar nonparticipant, and then the average difference in outcomes across the two groups is compared to get the effect of microfinance. This matching on observational characteristics is at the same time a limitation of PSM. Non-observable characteristics could not be taken into account. After the matching, the average effect of the program is calculated as the mean difference in outcomes across these two groups. There are several matching methods, including: Nearest Neighbour matching, Stratification method, Radius matching and Kernel matching. In this research I used Nearest Neighbour (NN) matching. NN matching matches each of the respondents in the target group to a respondent in the control group (with replacement) whose general characteristics (propensity score) match best with the respondent in the target group. NN matching is used for two reasons: i) the target group is bigger than the control group, so some propensity scores from the control group should be used twice to match all the respondents of the target group, ii) NN matching finds the propensity score that is the most closely related to the target group and therefore gives the most reliable outcomes (Khandker *et al.*, 2010). There are 212 out of 250 respondents from the control group used for the NN matching. Appendix 3 shows the outcomes of the probit model. The balancing property of the probit is balanced and the region of common support is [.36281989, .76985469].

### 4.8 Limitations

Limitations could be divided in limitations regarding impact evaluations and using quantitative methods. Impact evaluations should take into account that in social science there are spill-over effects. This means that even though members of the control group do not receive microfinance services from the specific research program, they are affected by the treatment regarding knowledge and imitation effects (Duflo *et al.*, 2007).

In addition, microfinance interventions happen in a broader social context. The intervention is implemented in a certain region where researchers try to assess the impact. However, mostly the microfinance intervention is not the only intervention in that specific region. For example

government programs could intervene in the same region as the microfinance programs. Clients and non-clients could be affected by both the microfinance intervention as the government program. This makes it more difficult to assign the outcomes found to the microfinance intervention (Duvendack *et al.*, 2011).

Indicators to measure impact as well as the outcomes measured differ strongly among the different microfinance impact studies (Duvendack *et al.*, 2011; van Rooyen *et al.*, 2012). These studies choose their own indicators to measure impact; this means that different impact studies assess different kinds of impact. These factors make it more difficult to draw clear conclusions about the impact of microfinance.

Quantitative studies do not take into account the underlying motives of people. They can only deliver the outcomes formulated in the questionnaire. This limits the explanations and nuances participants want to make. Mixed methods are therefore a popular method in research. Qualitative methods can then be used to give meaning to the quantitative outcomes. Qualitative methods give the participant and the interviewer the opportunity to arrive at a better understanding of the reality they observe. Moreover, qualitative methods can be used to assess social relations and sensitive information.

## 4.9 Ethics

Research ethics are of the utmost importance. The interviewers emphasized that participation in the study was completely voluntary. Before each interview started, room was created to turn down participation. In order to allow people to turn down participation, a reserve sample list was composed for each region. Furthermore, all interviewers guaranteed anonymity and confidentiality. In this research I only use aggregated results and the data will be treated confidentially. Finally, working with a control group raises ethical issues. It is difficult to judge the ground on which people are assigned to a target or control group. People in the control group are excluded from a potential benefit (Duvendack *et al.*, 2011). As a solution, in this study the control group consisted of future clients who were already selected to receive a loan in the future.



## Chapter 5. Results

Before the various impact indicators were analysed, I give an overview of the financial and general characteristics of the target group and the control group. Only if these two groups have similar general characteristics, it is possible to assign the difference in their outcomes to the services of VisionFund Ghana. Afterwards, the impact of VFG was measured on the five impact dimensions described in the Theory of Change. Finally, I focus on the impact of microfinance on female and rural clients.

### 5.1 Financial Characteristics

In order to identify the impact of microfinance, it is important to determine that the target group has more financial resources than the control group. The financial characteristics are summarized in Table 3.

#### Findings

- Based on the data provided in Table 3, 38 respondents were removed from the control group sample because they had already received a loan from an institution other than VFG. Including these respondents would dilute our conclusions about the impact of receiving a loan from VFG.
- Table 3 also shows that significantly more respondents in the target group have savings than in the control group. However, about 76% of the control group already has savings. It is not clear for how long they already accumulate savings, and therefore it is not possible to eliminate the impact of VFG savings on the various impact domains. Figure 2 illustrates the various locations where people keep their savings.<sup>2</sup>
- Likewise, based on Table 3 I see that clients from VFG have significantly more often insurance than the control group. However, similar to the above, a major part of the control group (78%) already had insurance before they become a client of VFG. For this reason it is not possible to single out the impact of VFG insurances on the various impact domains. As shown in figure 3, health insurance is most common, over 50% of the control group has health insurance and even 85% of the target group has health insurance. Life and Crop insurance are less common in both the target group and the control group.

Based on these findings I have decided to mainly focus on the impact of receiving a loan from VFG, taking into account that VFG offers complementary services and products such as savings and insurances. Thus, the found impact should be seen as the result of the total microfinance package offered by VFG.

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<sup>2</sup> VFG has some conditions which should be met before future clients receive a loan. One of these conditions is that future clients need to save a self-chosen amount of money in the six months before they receive a loan. This restriction is made to improve trust and build a relationship between the MFI and the client. The total amount of savings is at least 15% of the amount of the first issued loan. This explains the 21.6% of members of the control group which have savings at VFG.

Table 3: Characteristics of financial and non-financial services of VFG

Variable	Target Group (N=246)		Control Group (N=250)		Results
	Frequency	Percent	Frequency	Percent	Difference <sup>a</sup>
% people receiving a loan	234	95.1	38	15.2	79.9***
% people having savings	236	95.9	191	76.4	19.5***
% people having insurance	224	91.1	196	78.4	12.7***
% participation in business trainings	165	67.1	n/a	n/a	n/a
% people frequently <sup>b</sup> participating in group meetings	148	60.2	n/a	n/a	n/a

\* Significant at 10% level; \*\* Significant at 5% level; \*\*\* Significant at 1% level

<sup>a</sup> The difference is calculated by taking the absolute value of the difference between in the percentage of the target group and the percentage of the control group.

<sup>b</sup> "Frequently" refers to people who participate once every two week or more often in the group meetings.

Figure 2: Types of savings

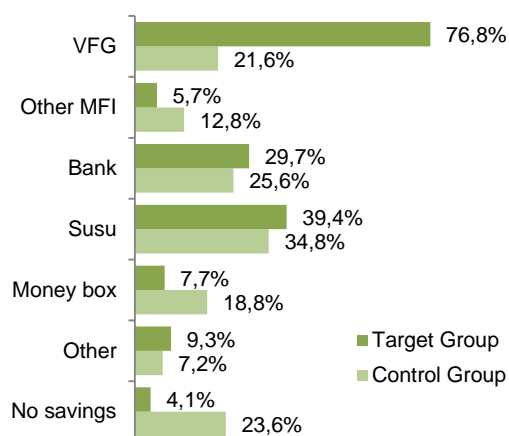
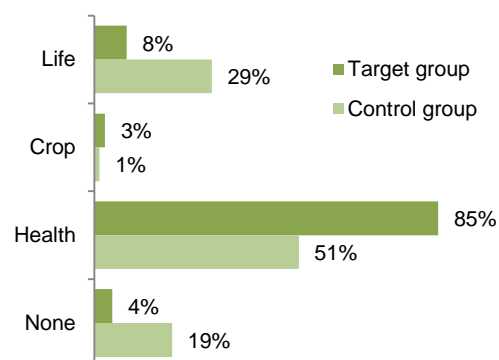


Figure 3: Type of Insurance



## 5.2 General Characteristics

The general characteristics of both the target group and the control group are summarized in Table 4. These general characteristics are the so-called independent variables; this means that I assume that they do not depend on microfinance interventions. A simple regression is executed to find the impact of microfinance. The outcomes of this regression are shown in annex 2. The first regression measures the differences between the target group and the control group, and the second regression also assess the differences between the target group and the control group, taking into account the general characteristics.

Based on the data in Table 4 and figures 4-7, I can conclude that the target group and control group do not differ significantly with regard to the level of literacy, education, marital status, age, and owning a business. However, the percentage of **women** is significantly higher in the control group than in the target group. In addition, the percentage of respondents in the target group living in a **rural** area is significantly higher than in the control group.

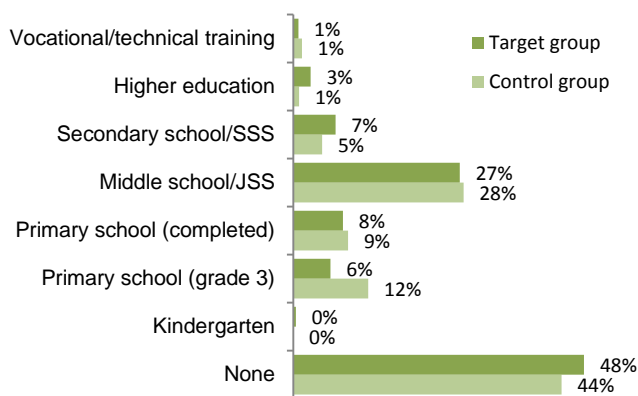
The differences in gender and location between the target group and control group makes it impossible to conclude that observed differences in outcomes on the impact indicators are the results of microfinance; it might be that these differences in outcomes are caused by the differences in gender and/or location.

Table 4: General characteristics

Variable	target group (N=246)	control group (N=212)	Difference
	Percent	Percent	
<b>% Women</b>	74.4	85.9	11.5***
<b>% Literate people (able to read)</b>	35.8	29.3	6.5
<b>% Higher educated respondents</b>	45.9	43.9	2
<b>% (Married) couples</b>	81.3	79.7	1.6
<b>% Respondents with own business</b>	99.2	99.5	0.3
<b>% Respondents living in rural areas</b>	46.3	36.8	9.5**

\* Significant at 10% level; \*\* Significant at 5% level; \*\*\* Significant at 1% level

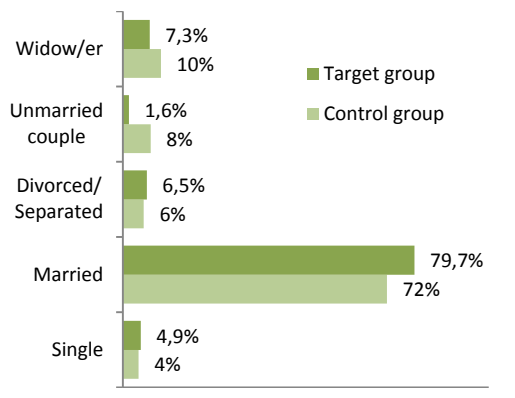
Figure 4: Education categories



Chi-squared = 9.55

\* Significant at 10% level; \*\* Significant at 5% level; \*\*\* Significant at 1% level

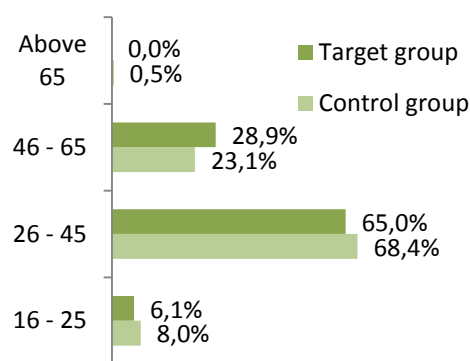
Figure 6: Marital status



Chi-squared (4) = 11.43\*\*

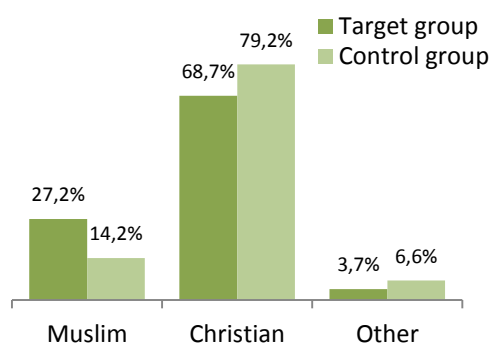
\* Significant at 10% level; \*\* Significant at 5% level; \*\*\* Significant at 1% level

Figure 5: Age categories



Chi-squared = 3.39

Figure 7: Religion



Chi-squared (5) = 16.48\*\*\*

### 5.3 Sustainable Livelihoods

Table 5 summarizes the impact of microfinance VFG provides on the livelihoods of its clients. The impact on sustainable livelihoods is measured by six indicators derived from the Theory of Change: perceived increase in income; perceived increase in savings; food security; food intake; ownership of assets; and living standards.

## Findings

- + A higher percentage of clients of VFG (about 75%) have **perceived an increase in income** over the past 12 months compared to the control group (60.9%). Respondents were asked to indicate whether they had observed an increase, decrease, or no change in their income. About 24% of VFG's clients have observed a great increase in income (more than 20%); about 51% of the clients observed a slight increase; 8.5% observed no change; and about 16.5% of the clients has observed a decrease in income over the past 12 months. The calculated impact on perceived increase in income is 17.7% at a 5% significance level.
- + Microfinance provided by VFG has a positive impact on **perceived increase in savings**. Clients of VFG have more often (23.3%) experienced an increase in savings over the past 12 months. In this period about 72% of VFG's clients and about 52% of the control group has perceived an increase in savings.
- + Evidence is found that there is a considerably high impact of 5.6% of microfinance on food intake. In other words, clients of VFG consume 5.6% more **meals** per day. Although this is a positive result, on average clients of VFG still consume less than 3 meals a day (2.8 meals a day). Moreover, about 28.5% of the clients **had to skip a meal or cut the size of a meal** because of food insufficiency in the last 3 months. Due to the similar results observed in the control group no impact is observed.
- + In line with our Theory of Change, a positive impact is observed on the number of **assets owned**. The calculated impact is 6.5%.
- + Table 5 indicates that the impact of microfinance on the **living standards** is small (4.7%). This difference between the target group and the control group is not significant. The sample size should be 506 to find a significant difference of 10%.<sup>3</sup>

Table 5: Impact on sustainable livelihoods

Variable	Target Group (N=246)	Control Group (N=212)	Results	Power Sample Size <sup>a</sup>	
	<i>Frequency (%)</i>		<i>Difference<sup>b</sup></i>	<i>Impact (%)<sup>c</sup></i>	
<b>% people perceived an increase in income</b>	74.8	60.8	10.8**	17.7**	N/A
<b>% people perceived an increase in savings</b>	83.9	63.0	14.7***	23.3***	N/A
<b>% people reducing their food intake in past 3 months</b>	28.5	31.6	0.3	0.9	1952
	<i>Mean</i>		<i>Difference</i>	<i>Impact (%)</i>	
<b>no. meals a day</b>	2.833	2.660	0.15***	5.6***	N/A
<b>Ownership of assets (Assets Index)<sup>d</sup></b>	0.380	0.340	0.022*	6.5*	N/A
<b>Living standards (Housing Index)<sup>e</sup></b>	0.587	0.535	0.025	4.7	506
<b>Sustainable Livelihoods Index<sup>f</sup></b>	0.617	0.534	0.054***	10.1***	N/A

\* Significant at 10% level; \*\* Significant at 5% level; \*\*\* Significant at 1% level

<sup>3</sup> When using PSM, the difference between the target group and the control group is only 4.7%, while the difference is almost 10% when the simple means are compared. Power calculations are carried out on the simple means. The difference calculated between the simple means is bigger than at PSM. Therefore, power calculations show a smaller sample size needed to find a significant difference of 10%.

<sup>a</sup> The Power Sample Size shows the minimum sample size (target group and control group combined) needed to explain an impact of 10% at a 5% confidence level and a power of 0.9.

<sup>b</sup> The difference is the absolute difference between the target group and the control group, and this is calculated by using PSM.

<sup>c</sup> The impact is the relative difference between the target group and the control group. This impact is calculated to divide the difference by the value of the control group.

<sup>d</sup> The composed Assets Index is a non-weighted index in which all household assets are included (that is; radio; bicycle; bed frame with mattress; refrigerator; television; computer/laptop; mobile phone; fishing net; tri-cycle; motorcycle; donkey/bullock; tractor; car/pick-up truck; other items with value of more than 1000 GHS). This means that I simply sum up the number of assets owned, which is equivalent to setting asset = 1 for each asset and divide this total number by the total number of assets included (=14).

<sup>e</sup> The quality of housing is measured with a Housing Index indicator that includes (1) access to safe drinking water; (2) electricity; (3) concrete floor; (4) flush toilet; (5) cooking fuel; and (6) solar lightning. Likewise the Assets Index, the Housing Index is a non-weighted index whereby I simply add up the number of housing indicators with a maximum score of 6.

<sup>f</sup> In this index all 6 sustainable livelihood indicators are included and equally weighted, so that each of them receives 1/6 weight. The maximum score on the index is 1.

## 5.4 Essential Services: Education and Health

Right to essential services is defined by two domains: education and health. The included indicators are 1) formal school enrolment; 2) school dropouts; 3) deliveries attended by skilled health personnel; 4) ill health of respondents; and 5) mortality among children under five years old.

### Findings

- + There has been a small impact on formal **school enrolment**. About 95% of the children of school-going age is enrolled in formal education. This outstanding score can be partly explained by Ghana's compulsory primary education system. However, the rate is also high compared to the national enrolment rate (82% in 2012) in Ghana<sup>4</sup>.
- o No impact is observed regarding **school drop outs**. No improvement is observed, because both the target group and the control group have similar school dropout rates.
- The significant impact of microfinance on **illness** of minus 41.1% is remarkable. Compared to the control group, the target group scores higher on ill health: about 30.1% of the target group was ill to the extent that he or she was unable to participate in daily activities while only 20.7 % of the control group has been considerably ill in the last 3 months.
- + Based on the data in Table 6, having a loan from VFG is positively associated with a lower percentage of **children who died before they turned 5 years old**. In the target group only 2.8% of the children died before the age of five, while in the control group this number is 8%. Therefore this indicator shows a big significant impact of 105%.
- o The **Essential Services Index** shows a small positive impact. However, I found mixed impact outcomes on the indicators included in this index. For example, there is negative impact on the number of school dropouts and on the percentage deliveries attended by skilled health personnel. But a small positive impact is measured on formal school enrolment. This means that the total Essential Services Index is mainly determined by the realized impact on the variable children who died before they turned 5 years old and illness. For this reason, it is difficult to conclude that there is impact found on the total index or right to essential services.

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<sup>4</sup> <http://data.worldbank.org/indicator/SE.PRM.NENR>

Table 6: Impact on education and health

Variable	Target Group (N=246)	Control Group (N=212)	Results		Power Sample Size
	Frequency (%)		Difference	IMPACT (%)	
% Children of school-going age enrolled at formal school <sup>a</sup>	95.0	91.4	3.9*	4.3*	N/A
% Households with no school dropouts <sup>b</sup>	92.6	92.2	-0.7	-0.8	500 <sup>c</sup>
% Deliveries attended by skilled health personnel <sup>d</sup>	88	86.5	-3.7	-4.3	328
% People ill in last 3 months	30.1	20.7	- 8.5*	-41.1*	N/A
% Children who died before the age of 5 <sup>e</sup>	2.8	8	8.4***	105***	N/A
Essential Services Index <sup>f</sup>	0.873	0.883	-0.009	-1	144

\* Significant at 10% level; \*\* Significant at 5% level; \*\*\* Significant at 1% level

<sup>a</sup> Due to respondents without children in the school-going age, the sample size of the target group is n=217, and of the control group, n=192.

<sup>b</sup> Due to respondents without children in the school-going age, the sample size of the target group is n=217, and of the control group, n=192.

<sup>c</sup> This sample size is needed to show a value of 100% enrollment in formal school in the target group. In other words, the value of the control group is already high, which makes it hard to find a significant impact.

<sup>d</sup> Due to respondents without births in the last five years, the sample size of the target group is n=107, and of the control group, n=113.

<sup>e</sup> Due to respondents without births in the last five years, the sample size of the target group is n=107, and of the control group, n=113.

<sup>f</sup> In this index all 5 education and health indicators are included and equally weighted, so that each of them receives 1/5 weight. The maximum score on the index is 1.

## 5.5 Life and Security

Based on the Theory of Change I expect that obtaining a loan and additional microfinance services makes clients less vulnerable to disasters. Less vulnerable people are likely to have increased capacities to develop social and economic empowerment and they will feel more confident towards the future. Three indicators were defined to measure the impact on vulnerability. The first indicator measures whether respondents experienced physical damage from a disaster to themselves or their belongings. The second indicator describes if people feel confident to cope with future disasters. The third indicator refers to the extent in which respondents have taken measures to cope with future disasters.

### Findings

- + About 44% of VFG's clients feel **confident in coping** with future disasters. A lower percentage (37%) of the control group feels confident about their coping capacities in the future. The impact of microfinance is about 14.9%, although this impact is not significant.
- + Compared to the control group, VFG's clients are better prepared for future disasters. About 55% of the clients have taken **measures** in order to cope with potential disasters. The impact is 44%, which means that clients from VFG have taken significantly more measures than the control group.
- + In general, microfinance has a positive impact on life and security measured in the total **Life and Security Index** (29.4%). This means that VFG's clients are less vulnerable to disasters and uncertainties. Moreover, microfinance has improved their perceived resilience, as they feel confident to cope or recover from a shock in the future.

Table 7: Life and security

Variable	Target Group (N=246)	Control Group (N=212)	Results	Power Sample Size	
	<i>Frequency (%)</i>		<i>Difference</i>	<i>IMPACT (%)</i>	
<b>% people feeling confident to cope with future disasters</b>	44.3	36.9	5.5	14.9	4428
<b>% people taken measures to cope with future disasters</b>	54.5	35.9	15.8***	44***	N/A
<b>Life and Security Index<sup>a</sup></b>	0.494	0.364	0.107***	29.4***	N/A

\* Significant at 10% level; \*\* Significant at 5% level; \*\*\* Significant at 1% level

<sup>a</sup> In this index all 2 life and security indicators are included and equally weighted, so that each of them receives 1/2 weight. The maximum score on the index is 1.

## 5.6 Social and Political Participation

The indicators of participation measure the self-confidence and empowerment of respondents to participate in local government and social organizations. In our analysis I have taken into account nine different types of organizations. People can hold different positions in these organizations, or have different tasks and responsibilities. Therefore, I have distinguished three types of participation: general membership, influential position, and leadership position.

### Findings

- The survey data does not indicate any **significant impact of** microfinance on the 3 indicators of social and political participation. The impact I found is small on all the indicators. Accordingly, the **Social and Political Participation Index** does not show impact. Clients of VFG are not politically or socially more active than respondents in the control group. Consequently, I did not find a significant impact.

Table 8: Social and political participation

Variable	Target Group (N=246)	Control Group (N=212)	Results	Power Sample Size	
	<i>Mean</i>		<i>Difference</i>	<i>IMPACT (%)</i>	
<b>No. membership positions per person (index)<sup>a</sup></b>	2.65 <sup>b</sup>	2.56	0.013	0.5	1768
<b>No. influential positions per person (index)</b>	0.15	0.1	0.002	2	46530
<b>No. leadership positions per person (index)</b>	0.54	0.44	-0.005	-1.1	15636
<b>Social and Political Participation Index<sup>c</sup></b>	0.085	0.076	0.001	1.3	2268

\* Significant at 10% level; \*\* Significant at 5% level; \*\*\* Significant at 1% level

<sup>a</sup> The various social and political participation indices include 9 different types of organisation: religious organisation; community organisation; sport club; school organisation; women's organisation; political party; trade union; farmer organisation; other.

<sup>b</sup> This outcome shows that, on average, members of the target group hold 2.65 out of 9 membership positions.

<sup>c</sup> The different positions presuppose and improve self-confidence and empowerment at different levels; the Social and Political Participation Index is therefore a weighted index. For the sake of simplicity, the values that are assigned to the different levels of participation are evenly distributed. Therefore, the index is constructed as follows: membership weighs for 1/6, influential position for 2/6, and leadership position for 3/6.

## 5.7 Identity

In the Theory of Change I assume that microfinance would be able to empower women. The included empowerment variables describe the involvement of women in the decision-making process with regard to household expenditures, family planning, and the use of contraceptives. Furthermore, empowerment transforms power relations and consequently increases the self-esteem of women. Women's empowerment is an element of our right identity and is an important objective of VFG. VFG focuses its programs and services on women. Table 10 summarizes the main findings related to gender justice.

### Findings

- + Women's ability to obtain **contraceptives** is improved for VFG's clients when they have a loan. Compared to the control group, clients of VFG are 5.2% more empowered in decision-making on contraceptives.
- + There is also a positive impact (5.6%) of microfinance on people's **self-esteem**. About 79% of VFG's clients is more **confident** than 3 years ago, although this impact is not significant.
- + Microfinance has a significant positive impact on all 4 indicators measuring empowerment and reproductive rights. Microfinance has a positive impact of 3.8% on the total **Identity Index**.

Table 9: Identity

Variable	Target Group (N=246)	Control Group (N=212)	Results	Power Sample Size	
	<i>Frequency (%)</i>		<i>Difference</i>	<i>IMPACT (%)</i>	
% economic empowerment	73.6	75.0	2.1	2.8	1408
% empowerment family planning	95.9	93.9	1.8	1.9	648 <sup>a</sup>
% empowerment contraceptives	98.4	93.9	4.9***	5.2***	N/A
% increase in self-esteem	78.6	71.9	4.0	5.6	634
<b>Identity Index<sup>b</sup></b>	0.866	0.836	0.032*	3.8*	N/A

\* Significant at 10% level; \*\* Significant at 5% level; \*\*\* Significant at 1% level

<sup>a</sup> This sample size is needed to show a value of 100% empowerment regarding family planning in the target group. In other words, the value of the control group is already high, which makes it hard to find a significant impact.

<sup>b</sup> In this index all 4 identity indicators are included and equally weighted, so that each of them receives 1/4 weight. The maximum score on the index is 1.

## 5.8 Impact on clients disaggregated by sex and location

In previous sections, I analysed the differences in outcomes between current clients of VFG and future clients. In the following section I make another distinction. I focus only on female clients and rural clients. This selection is in line with VFG's mission and client focus: the majority of the clients is made up of women, lives in rural areas and has an own business.

### 5.8.1 Impact on female clients

In order to measure the impact on female clients I dropped the answers of all male clients and male future clients from consideration. Next, I calculated the impact between the target group and the control group through Propensity Score Matching.



Table 10 summarises the results. A positive impact figure for women means that the female clients score significantly better on that impact indicator compared to females in the control group as an effect of microfinance.

## Findings

- + Microfinance has a significantly positive impact on the **livelihoods** of female clients. Apart from the food sufficiency indicator, all sustainable livelihood indicators have a positive impact as an effect of microfinance (total impact on the sustainable livelihood index is 12.8%).
- + Microfinance has a high impact on **savings** of females. Female clients were better able to **increase** their **savings** and **income** over the past 12 months compared to the women in the control group; the impact on perceived increase in income and saving was 15.2% and 38.2% respectively.
- o Even though the indicators regarding the right **essential services** show high impact, none of them show a significant difference between the target group and the control group. The sample size of these indicators is rather small and this could explain the reason no significant difference is found between the two groups. The power calculations show that the needed sample size is often lower than 500.
- + Access to financial services of VFG has also a positive impact on the ability of female clients to take **measures to cope with future disasters** (45.1%).
- + Microfinance impacts **women empowerment** when the woman receives the microfinance services. I found a positive impact on women power in decision-making on family planning and contraceptives. No significant positive impact is found on the economic empowerment indicator.
- + In addition, female clients have much more **self-esteem** (impact is 9.3%) through microfinance.
- + No impact is found on the indicators regarding social and political participation. Almost none of the female respondents are involved in social or political organizations. The high sample size needed to demonstrate a difference between the target group and control group combined with the low participation rates suggest that there is no impact.

Table 10: Impact of microfinance on women

Variable	Target Group (N=183)	Control Group (N=182)	Results		Power Sample Size
<b>Sustainable livelihoods</b>					
	<i>Frequency (%)</i>		<i>Difference</i>	<i>Impact (%)</i>	
% People perceived an increase in income	73.2	59.9	9.1*	15.2*	N/A
% People perceived an increase in savings	76	49.5	18.9***	38.2***	N/A
% people reducing their food intake in past 3 months	70.5	65.9	0.8	1.2	2184
	<i>Mean</i>		<i>Difference</i>	<i>Impact (%)</i>	
No. meals per day	2.825	2.659	0.127**	4.8**	N/A
Ownership of assets (Assets Index)	0.370	0.326	0.039**	12**	N/A
Living standards (Housing Index)	0.612	0.528	0.054**	10.2**	N/A
Sustainable Livelihood Index	0.616	0.522	0.067***	12.8***	N/A
<b>Essential Services</b>					
	<i>Frequency (%)</i>		<i>Difference</i>	<i>Impact (%)</i>	
% Children of school-going age enrolled at formal school <sup>a</sup>	95.7	91.5	2.9	3.2	290 <sup>b</sup>
% Households with no school dropouts <sup>a</sup>	92	91.5	-1.7	-1.8	454 <sup>c</sup>
% Deliveries attended by skilled health personnel <sup>d</sup>	92.6	85.4	3.8	4.4	360
% People ill in last 3 months	30.6	22.5	-6.4	-28.4	1230
% Children who died before the age of 5 <sup>d</sup>	1.5	5.1	3.6	70.6	800
Essential Services Index	0.872	0.878	-0.012	-1.4	148
<b>Life and Security</b>					
	<i>Frequency (%)</i>		<i>Difference (%)</i>	<i>Impact (%)</i>	
% People feeling confident to cope with future disasters	43.4	33.8	7.6*	22.5*	N/A
% People taken measures to cope with future disasters	50.9	33.5	15.1***	45.1***	N/A
Life and Security Index	0.471	0.337	0.113***	33.5***	N/A
<b>Social and Political Participation</b>					
	<i>Frequency (%)</i>		<i>Difference</i>	<i>Impact (%)</i>	
No. membership positions (index)	2.67	2.64	-0.009	-0.3	1768
No. influential positions (index)	0.13	0.09	0.001	1.1	49856
No. leadership positions (index)	0.35	0.31	0.003	1	18340
Social and Political Participation Index	0.66	0.62	0	0	2148
<b>Identity</b>					
	<i>Frequency (%)</i>		<i>Difference</i>	<i>Impact (%)</i>	
% economic empowerment	83.1	77.5	6.8	8.8	1230
% empowerment family planning	97.8	92.9	5.6**	6**	N/A
% empowerment contraceptives	98.4	93.4	5.9***	6.3***	N/A
% increase in self-esteem	78.7	69.8	6.5**	9.3**	N/A
Identity Index	0.895	0.834	0.062***	7.4***	N/A

\* Significant at 10% level; \*\* Significant at 5% level; \*\*\* Significant at 1% level

<sup>a</sup> Due to respondents without children in the school-going age, the sample size of the target group is n=162, and of the control group, n=164.

<sup>b</sup> This sample size is needed to show a value of 100%, or no drop-outs in formal school in the target group. In other words, the value of the control group is already high, which makes it hard to find a significant impact.

<sup>c</sup> This sample size is needed to show a value of 100% enrollment in formal school in the target group. In other words, the value of the control group is already high, which makes it hard to find a significant impact.

<sup>d</sup> Due to respondents without births in the last five years, the sample size of the target group is n=67, and of the control group, n=99.

## 5.8.2 Impact on clients in rural areas

The same approach was applied to measure the impact on rural clients. In this case, I dropped the answers of all respondents living in (semi)urban areas from consideration. Afterwards, I calculated the impact between the target group and the control group. A positive impact figure for rural clients indicates that microfinance has a positive effect on clients living in rural areas compared to future clients living in rural areas. Table 11 gives an overview of the results.

### Findings

- + Microfinance has a significantly positive impact on the **livelihoods** of rural clients. In particular, microfinance has a high impact on **income** and **savings**. Rural clients were better able to increase their income and savings over the past 12 months compared to the respondents from rural areas in the control group; the impact on perceived increase in income and saving was 56.5% and 44.3% respectively.
- + A highly considerable result is the decrease in number of **children that died** before they turned 5 years old in **rural areas** (impact is 208.6%).
  - o Although the indicators **enrolment**, **school drop outs**, and **skilled health personnel** show impact, the difference between the target group and the control group is not significant. Power calculations show that a sample size of only 450 makes it possible to find a significant difference between the two groups.
- + Obtaining a loan from VFG has also a positive impact on the ability of clients in rural areas to take **measures to cope with future disasters** (58.8%).
  - o Contrary to the Theory of Change, no significant impact of microfinance on women **empowerment** in rural areas is observed. However, there is a significant impact on **self-esteem** (impact is 16.8%), meaning that clients in rural area are more self-confident because of microfinance.
- In particular, clients located in rural areas are more often ill; the impact on those clients is minus 64.4%.
  - o The rural respondents are rarely involved in social and political organizations. The required sample size to demonstrate a difference between the target group and control group is even higher than for female clients.

Table 11: Impact of microfinance on clients living in rural areas

Variable	Target Group (N=132)	Control Group (N=134)	Results		Power Sample Size
<b>Sustainable livelihoods</b>					
	<i>Frequency (%)</i>		<i>Difference</i>	<i>Impact (%)</i>	
% People perceived an increase in income	76.5	47.8	27***	56.5***	N/A
% People perceived an increase in savings	82.6	53	23.5***	44.3***	N/A
% people reducing their food intake in past 3 months	66.7	63.4	2.5	3.9	2442
	<i>Mean</i>		<i>Difference</i>	<i>Impact (%)</i>	
No. meals per day	2.848	2.634	0.16**	6.1**	N/A
Ownership of assets (Assets Index)	0.354	0.315	0.02	6.3	518
Living standards (Housing Index)	0.523	0.464	0.027	5.8	608
Sustainable Livelihood Index	0.592	0.488	0.082***	16.8***	N/A
<b>Essential Services</b>					
	<i>Frequency (%)</i>		<i>Difference</i>	<i>Impact (%)</i>	
% Children of school-going age enrolled at formal school <sup>a</sup>	93.8	91	3.5	3.8	252 <sup>b</sup>
% Households with no school dropouts <sup>a</sup>	91.7	91.2	0.8	0.9	440 <sup>c</sup>
% Deliveries attended by skilled health personnel <sup>d</sup>	86.7	84.2	-3.4	-4	402
% People ill in last 3 months	33.3	20.2	-13**	-64.4**	N/A
% Children who died before the age of 5 <sup>d</sup>	4.8	8.1	16.9***	208.6***	N/A
Essential Services Index	0.857	0.880	-0.007	-0.8	152
<b>Life and Security</b>					
	<i>Frequency (%)</i>		<i>Difference</i>	<i>Impact (%)</i>	
% People feeling confident to cope with future disasters	42.6	36.4	3.3	9.1	4706
% People taken measures to cope with future disasters	51.5	30.6	18**	58.8**	N/A
Life and Security Index	0.470	0.335	0.106**	31.6**	N/A
<b>Social and Political Participation</b>					
	<i>Frequency (%)</i>		<i>Difference</i>	<i>Impact (%)</i>	
No. membership positions (index)	0.292	0.272	0.021	7.7	1958
No. influential positions (index)	0.008	0.006	0	0	99990
No. leadership positions (index)	0.066	0.049	-0.008	16.3	18424
Social and Political Participation Index	0.085	0.072	-0.001	1.4	2990
<b>Identity</b>					
	<i>Frequency (%)</i>		<i>Difference (%)</i>	<i>Impact (%)</i>	
% economic empowerment	70.5	75.4	-5.4	-7.2	1384
% empowerment family planning	94.7	94.8	-0.8	-0.8	770 <sup>e</sup>
% empowerment contraceptives	97.7	96.3	1.1	1.1	1094 <sup>f</sup>
% increase in self-esteem	81.3	68.4	11.5***	16.8***	N/A
Identity Index	0.860	0.837	1.6	1.9	186

\* Significant at 10% level; \*\* Significant at 5% level; \*\*\* Significant at 1% level

<sup>a</sup> Due to respondents without children in the school-going age, the sample size of the target group is n=120, and of the control group, n=125.

<sup>b</sup> This sample size is needed to show a value of 100% regarding enrollment in formal school in the target group. In other words, the value of the control group is already high, which makes it hard to find a significant impact.

<sup>c</sup> This sample size is needed to show a value of 100% regarding no school drop outs in formal school in the target group. In other words, the value of the control group is already high, which makes it hard to find a significant impact.

<sup>d</sup> Due to respondents without births in the last five years, the sample size of the target group is n=62, and of the control group, n=74.

<sup>e</sup> This sample size is needed to show a value of 100% empowerment regarding family planning in the target group. In other words, the value of the control group is already high, which makes it hard to find a significant impact.

<sup>f</sup> This sample size is needed to show a value of 100% empowerment regarding contraceptives in the target group. In other words, the value of the control group is already high, which makes it hard to find a significant impact.

## 5.9 Discussion

This section consists of four main parts: i) the services provided by VFG have impact on three out of the five basic rights; ii) perceived change indicators could give a bias in the outcomes; iii) the domains education and health have lower sample sizes due to data cleaning; and iv) power calculations broaden the understanding of required sample sizes.

The results show a clear positive impact of the services of VFG on the sustainability of livelihoods. Both income and savings increases a lot, and the asset index and housing index also report positive impacts. Although not many studies assess the impact on savings, the studies of Dupas and Robinson (2009) and Adjei *et al.* (2009) show also higher savings of clients compared to non-clients. Impact studies on income levels show mixed results, varying from no impact to positive impact (Ashraf *et al.*, 2009; Barnes *et al.*, 2001; Nanor, 2008). This study contributes to the evidence that microfinance increases the income levels of clients and the findings demonstrate that clients accumulate more assets than non-clients. The accumulation is confirmed by other studies (Adjei *et al.*, 2009; Brannen, 2010). However Barnes *et al.* (2001) show that the positive impact not holds over time, and Adjei *et al.* (2009) found that the length of time clients are involved in microfinance is not associated with higher asset accumulation. Barnes *et al.* (2001) and Brannen (2010) suggest that microfinances impacts housing (living standards) positively, though in this study no significant impact is found. In contrast to Doocy *et al.* (2005) and Brannen (2010), this study found that clients consumed significant more number of meals a day than non-clients.

In addition, many studies suggest that microfinance improves the health of clients, i.e. Adjei *et al.* (2009), Brannen (2010), Dupas and Robinson (2009), and Nanor (2008). Although these studies measure the impact in different manners, all suggest that microfinance positively impacts the health of clients. This study found less positive results. Clients had much less children before the age of five who died, but they were more often ill than non-clients. In line with the available evidence, indicators on education demonstrate no clear outcome. The findings suggest that clients take more often measures to cope with future disasters than non-clients. And although other studies not clearly focused on this indicator, Barnes *et al.* (2001) found that clients more often made reservations so they could smooth health shocks. The high impact on life & security endorse the conclusion of the study by Kumar and Newport (2005) that states that microfinance should be seen as an effective method for poor people to mitigate risk. Clients were a bit more empowered than non-clients, although this impact was mostly not significant. However, the impact is mostly significant on empowerment rates were the woman receives the microfinance services. This distinction is not made in most of the other studies, which also found small or no impact. No clear impact of microfinance on social participation was observed. In the theory of change, microfinance services impacts empowerment and afterwards empowerment will lead to higher social and political participation. It could be that the time frame of this study is too short, or that microfinance does not impacts the social and political participation of clients. There is no evidence found in the literature that microfinance impacts the social and political participation of clients.

Second, as discussed in the chapter Theory of Change, the indicators which measure a perceived change in the life of respondents could give a bias in the outcomes. Perceived change indicators could be suggestive. Respondents could believe that the intervention will have a positive impact on i.e. their income and will therefore be more positive, even though their income did not increase. Perceived change indicators could generate outcomes about what people believe that happened instead of what actually happened. That is the reason that other impact assessments use mostly expenditure or monetary income indicators to measure the impact of microfinance programs (Angelucci *et al.*, 2013; Attanasio *et al.*, 2011; Augsburg *et al.*, 2012; Banerjee *et al.*, 2009; Crépon *et al.*, 2011).

Third, for the indicators on the domains education and health a lot of data is missing because respondents have not received children in the last five years. Data cleaning was executed to remove the missing outcomes. This data cleaning reduced the number of observations. Even though the sample sizes were small, some significant impact is measured regarding some of

the indicators on education and health. Other indicators did not show significant differences between the target group and the control group, even though the difference in outcomes between the two groups was quite large. Especially in the part with the focus on women and rural people, the sample size was too small to find significant differences between the target group and the control group.

Last, power calculations were used to determine the sample size needed to find a significant difference of 10% between the target group and the control group. In this study, the indicators regarding the domains education and health show high impact, although this impact was not significant. This especially holds when I focus on women and rural people. A larger sample size would make it possible to find a significant impact. On the other hand, the rights social and political participation and identity show low impact outcomes. Only a very large sample size would show a significant difference between the target group and the control group. It is likely that in these domains no impact of microfinance will be found.

# Chapter 6. Conclusions and discussion

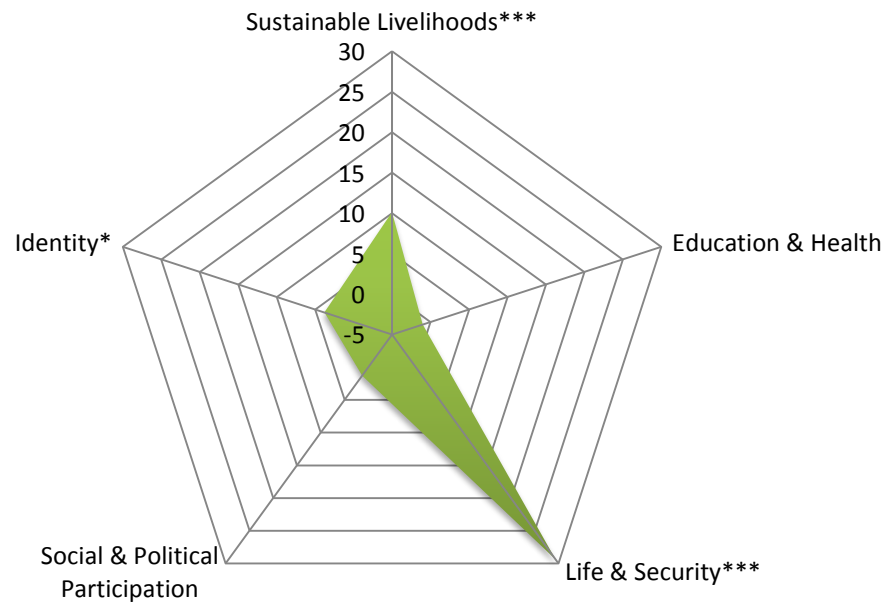
## 6.1 Conclusions

This study investigated the impact of both financial and non-financial products supplied by VFG. The data was collected through a quantitative survey. Subsequently, the impact was determined by means of a statistical assessment of the differences in outcomes on key impact indicators of VFG's clients set against the outcomes on those same indicators that would have occurred had these people not received products and/or services from VFG. A control group was composed as a proxy for what would have happened to the clients if they had not received a loan (or other services) from VFG. The total sample size included 496 randomly selected respondents: 246 were clients (including dropouts) of VFG between August 2008 and August 2010 and 250 respondents made up the control group of future clients. The study was focused on the impact of receiving microfinance over 3 to 5 years on the quality of life of VFG's clients. A number of questions were explicitly asked for quantifying any change over the last 12 months. The outcomes on these questions should be seen as the impact over 12 months in the context of obtaining a loan over 3 to 5 years. The central question of the study was: *what is the social and economic impact at the client level of the services provided by VFG?*

Based on the statistical analyses, it can be concluded that microfinance products and services provided by VFG have had a positive effect on the rights **sustainable livelihoods** (10.1%), **life & security** (29.4%), and to a lesser extent on **identity** (3.8%). In other words, VFG's clients take more **measures** (impact is 44%) to cope with future disasters and also feel more **confident** (impact is 14.9%) about facing potential threats in the future. This might be an indirect effect of the improved livelihood situation. In particular, more female clients have taken measures (45.1%) to **cope with future disasters**. It is found that over the last year, about 74.8% of VFG's clients had perceived an **income increase** (impact is 17.7%) and 72% had **more savings** (impact is 23.3%), which people may have used to invest in measures to become more resilient to threats. Apart from a positive impact on perceived income and savings, a positive impact on the **accumulation of assets** (6.5%) is found. In addition, microfinance had a higher impact on asset accumulation for female clients compared to women in the control group (12%). A positive impact of microfinance is found on **empowerment regarding the use of contraceptives** (5.2%). While zooming in on the impact of microfinance on **women**, a remarkable high positive impact of 9.3% is identified on the **increase in self-esteem**.

No impact is found on the other rights **education & health** and **social & political participation**. There is a small negative impact found on the **essential services** (minus 1%); an index that consists of education and health variables. There is a negative impact of microfinance on **illness** (minus 41.1%). However, the impact on the number of **children who died aged under 5 years** is positive (105%). Therefore, I have found only a small negative impact on essential services. For clients in **rural areas**, the impact on illness is even worse (minus 64.4%), but there is a decent positive impact on children who died before the age of five (208.6%). Finally, no clear impact of microfinance on **social participation** was found (1.3%). This also holds for female clients and clients living in rural areas.

Figure 8: Overview of measured impact (%) on the five basic rights



\* Significant at 10% level; \*\* Significant at 5% level; \*\*\* Significant at 1% level

## 6.2 Discussion

This study assessed the impact of the microfinance services of VFG in Ghana. In the last chapter, the results were put into perspective considering other impact studies. This section discusses the need for mixed methods and the need for replication.

In recent times, econometric models are highly valued by politicians and also economists. This study is herein not an exception. However, mathematical contributions to the debate about the impact of microfinance have their limitations. Most of the microfinance impact evaluations are not replicated. Without replication the reliability of impact evaluations will be put under pressure. Furthermore, the complex social environment makes the calculated impact less reliable (Leamer, 1983). To make outcomes of impact evaluations more reliable, they should be done in a more multidisciplinary way, and this means that besides mathematics, other disciplines like history, political science, and philosophy can be used to describe the impact (Skidelsky, 2010). This limitation of econometric or quantitative research is already discussed in the methodology of this paper. To give a more balanced and reliable view, Oxfam Novib wants to use *stories of change* in the near future. This qualitative data can be used to give a better understanding of the quantitative outcomes.

It is not possible to measure the impact of microfinance in a laboratory like in medicine research. Microfinance institutions operate in a complex social environment and assessing the impact is therefore difficult. The impact measured in this study could only be assigned to the impact measured from the services provided by VisionFund Ghana from 2008-2013. Therefore, generalization of this impact is difficult. In the recommendations I discuss the need for replication to improve external validity.



## Chapter 7. Recommendations

Based on the findings in this study several recommendations for further research can be formulated. The sample size of this study was 496, including 246 clients (target group) and 250 future clients (control group). To measure the impact of microfinance, some of the data of the respondents from the control group was deleted because those respondents were already using microfinance services. Furthermore, the domains health and education contained some indicators which measured the impact of microfinance on children. However, some respondents did not have children so those outcomes could not be used in the study. For this reason the sample size of the domains health and education was quite small. Further research should take into account these factors that influence the size of the useful data.

Another study could assess the bias of the perceived change indicators. This study could calculate the differences between the perceived change of respondents and the actual change. In this study it can be assessed whether respondents will overestimate, underestimate, or calculate their situation correctly.

This study used a quantitative approach to assess the impact of microfinance. I recommend that in future research mixed methods are used to attain a more reliable impact evaluation. Qualitative methods can be used to complement quantitative methods. Qualitative methods are especially useful to assess social relations and sensitive information. Furthermore, qualitative research puts the outcomes of the quantitative into perspective.

In line with Hamermesh (2007) I suggest to improve reliability by replication of research. The limitation of impact studies is that they always should be interpreted as the outcomes of an intervention within a broader social context. As pointed by (Hamermesh (2007)), statistical replication is a reproduction of a study with a different sample, but the model and the population is similar. Thus, statistical replication can be used to increase internal validity.

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# Appendices

## Annex 1 Questionnaire

You can only use this questionnaire if the app is not working, the battery of your mobile phone is empty or when there are some other technical problems that cause the not well functioning of your app.

### Part 0: Administration

1. **Type of Respondent:** (one answer possible)

- target group  
 control group

2. **The name of the region:** (one answer possible)

- |                                      |  |                                     |
|--------------------------------------|--|-------------------------------------|
| <input type="checkbox"/> Brong Ahafo | <input type="checkbox"/> Greater Accra | <input type="checkbox"/> Upper West |
| <input type="checkbox"/> Central     | <input type="checkbox"/> Northern      | <input type="checkbox"/> Volta      |
| <input type="checkbox"/> Eastern     | <input type="checkbox"/> Upper East    | <input type="checkbox"/> Western    |

3. **Code of interviewer:** \_\_\_\_\_

4. **Code of respondent:** \_\_\_\_\_

5. **Date of the interview:** (date) the date that the interview took place. Please enter day, month and year.

Day: \_\_\_\_\_ Month: \_\_\_\_\_ Year: \_\_\_\_\_

6. **Location:** (one answer possible)

- Urban       Semi-Urban       Rural

### Part 1: Respondent characteristics

7. **What is your sex?** (one answer possible)

- Male  
 Female

8. **What is your age?** (one answer possible)

- 0-15     16-25     26-45     46-65     Above 65

9. **Are you able to read?** (one answer possible)

- Yes  
 No

10. **What is your highest level of education?** (one answer possible)

- |   |  |
|---|--|
| <input type="checkbox"/> None   | <input type="checkbox"/> Middle school / JSS             |
| <input type="checkbox"/> Kindergarten                                   | <input type="checkbox"/> Secondary school / SSS          |
| <input type="checkbox"/> Primary school (completed grade 3) institution | <input type="checkbox"/> Higher education / Tertiary     |
| <input type="checkbox"/> Primary school (completed grade 6)             | <input type="checkbox"/> Vocational / Technical training |

**11. What is your marital status?** (one answer possible)

- Single
- Married
- Divorced or Separated
- Unmarried couple
- Widow/er

**12. To which ethnic group do you belong?** (open answer)

\_\_\_\_\_

**13. What is your religion?** (one answer possible)

- Muslim
- Traditional religion
- Christian
- Other
- Jewish
- None

**14. What kind of work are you involved in?** (one or more answers possible)

Farming	<input type="checkbox"/>
Fishing	<input type="checkbox"/>
Livestock rearing	<input type="checkbox"/>
Own business	<input type="checkbox"/>
Agricultural labour employment	<input type="checkbox"/>
Non-agricultural labour employment	<input type="checkbox"/>
Housekeeping	<input type="checkbox"/>
Other	<input type="checkbox"/>
None (respondent is not working)	<input type="checkbox"/>

**15. How many people are living in your household?** (open answer, number)

\_\_\_\_\_

**16. How many household members earn an income by working?** (open answer, number)

\_\_\_\_\_

## Part 2: Sustainable livelihoods

**17. During the last 12 months, what were the sources of your household income?** (one or more answers possible)

Own farming /livestock / fisheries	<input type="checkbox"/>
Own business / service	<input type="checkbox"/>
Wage labour	<input type="checkbox"/>
(Governmental) Financial support	<input type="checkbox"/>



Interest on savings	<input type="checkbox"/>
Remittances from family / friends	<input type="checkbox"/>
Pension	<input type="checkbox"/>
Other	<input type="checkbox"/>
None (household has no sources of income)	<input type="checkbox"/>

**18. If answer Q17 is “Own Business”; Do you have a formal registration number for your business?** (yes-no)

- Yes  
 No

**19. In the past 12 months, has there been any change in the total value of the combined income of all members of your household?** (one answer possible)

- Greatly increased (>20%)  
 Slightly increased (<20%)  
 No change (0%)  
 Slightly decreased (<20%)  
 Greatly decreased (>20%)

**20. This question is about the items that your household might own. I will read a list of items and I would like you to indicate if you or anyone in the household owns this item.** (yes-no per item)

Only answer this question with yes when all components of the item are owned by the household (bed frame AND mattress) and when the item is working (the radio player should make sound).

	Yes	No
Radio or tape player	<input type="checkbox"/>	<input type="checkbox"/>
Bicycle	<input type="checkbox"/>	<input type="checkbox"/>
Bed frame with mattress	<input type="checkbox"/>	<input type="checkbox"/>
Refrigerator	<input type="checkbox"/>	<input type="checkbox"/>
Television	<input type="checkbox"/>	<input type="checkbox"/>
Computer or laptop	<input type="checkbox"/>	<input type="checkbox"/>
Mobile phone	<input type="checkbox"/>	<input type="checkbox"/>
Fishing net	<input type="checkbox"/>	<input type="checkbox"/>
Tri-cycle	<input type="checkbox"/>	<input type="checkbox"/>
Motorcycle	<input type="checkbox"/>	<input type="checkbox"/>
Donkey/Bullock	<input type="checkbox"/>	<input type="checkbox"/>
Tractor	<input type="checkbox"/>	<input type="checkbox"/>
Car/pick-up truck	<input type="checkbox"/>	<input type="checkbox"/>
Other item with value > 1000 GHS	<input type="checkbox"/>	<input type="checkbox"/>

21. This question is about your housing. I will read a list of items and I would like you to indicate if your household owns or has access to this item. (yes-no per item)

	Yes	No
Safe drinking water	<input type="checkbox"/>	<input type="checkbox"/>
Electricity	<input type="checkbox"/>	<input type="checkbox"/>
Concrete floor	<input type="checkbox"/>	<input type="checkbox"/>
Flush toilet	<input type="checkbox"/>	<input type="checkbox"/>
Cooking fuel	<input type="checkbox"/>	<input type="checkbox"/>
Solar lightning	<input type="checkbox"/>	<input type="checkbox"/>

22. On average, how many meals a day (breakfast, lunch, diner) did your household members consume during last month? (one answer possible)

- Zero meals per day
- One meal per day
- Two meals per day
- Three meals per day
- More than three meals per day

23. In the last 12 months, did you or other adults in your household ever cut the size of your meals or skip meals because there was not enough money for food? (yes-no)

- Yes
- No

### Part 3: Social Welfare

24. How many *girls* in your household are in the school age (6 - 18 years of age)? (open answer, number)

\_\_\_\_\_

25. How many *boys* in your household are in the school age (6 - 18 years of age)? (open answer, number)

\_\_\_\_\_

26. If answer Q24 is > 0; How many of the *girls* in the school age are going to formal school? (open answer, number)

\_\_\_\_\_

27. If answer Q25 is > 0; How many of the *boys* in the school age are going to formal school? (open answer, number)

\_\_\_\_\_

28. In the last 12 months, has any of your children (total girls and boys in the school age) left school without completion? (yes-no)

Yes

No

29. If answer to Q28 is "yes"; How many *girls* left school without completion? (open answer, number)

\_\_\_\_\_

30. If answer to Q28 is "yes"; Please indicate how many of those *girls* are not able to read and write? (open answer, number)

\_\_\_\_\_

31. If answer to Q28 is "yes"; How many *boys* left school without completion? (open answer, number)

\_\_\_\_\_

32. If answer to Q28 is "yes"; Please indicate how many of those *boys* are not able to read and write? (open answer, number)

\_\_\_\_\_

33. How many children were born in your household during the last five years? (one answer possible)

0  1  2  3  4  5  6  7  8

34. If answer to Q31 is 1 or more; How many of those deliveries were attended by skilled health personnel? (one answer possible)

1  2  3  4  5  6  7  8

35. If answer to Q31 is NOT 0; In the last 12 months, did any of the children in your household of 5 years or younger die? (yes-no)

Yes

No

36. If answer to Q33 is 1 or more; How many of these children of 5 years or younger have died during the last 12 months? (one answer possible)

1  2  3  4  5  6  7  8

37. In the last 3 months, have you been ill to the extent that you were unable to participate in normal daily activities? (yes-no)

Yes

No (go to Q39)

38. If the answer of Q35 is "yes"; Please indicate how many days (including weekends) you were unable to participate in daily activities? (open answer, number).

\_\_\_\_\_

#### Part 4: Gender and empowerment

39. Within your household, who decides on the use of household expenditures? (one answer possible)

- The man only  
 The woman only  
 Both man and woman  
 Not applicable

40. Within your household, who is making the decisions about family planning? (one answer possible)

- The man only  
 The woman only  
 Both man and woman  
 Not applicable

41. Within your household, who is making the decisions about contraceptives? (one answer possible)

- The man only  
 The woman only  
 Both man and woman  
 Not applicable

#### Part 5: Social and political participation

42. This question is about your participation in social organisations. Please answer which of the following organisations you are participating in and what your position is in this organisation. (please indicate for each organization what your role is, or if you are not participating in this organization, please fill in *Not applicable*)

	Member	Leadership position	Influenced decision making	Not applicable
Religious organisation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Community organisation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sports club	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
School organisation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Women's organisation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Political party	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Trade Union	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Farmers organisation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Part 6: Human Security**

**43. In the last 12 months have you experienced a negative impact or physical damage to yourself or your belongings because of...? (yes-no for each statement)**

	Yes	No
Banditry	<input type="checkbox"/>	<input type="checkbox"/>
State action	<input type="checkbox"/>	<input type="checkbox"/>
Civil unrest / armed conflict	<input type="checkbox"/>	<input type="checkbox"/>
Natural disaster	<input type="checkbox"/>	<input type="checkbox"/>
Discrimination	<input type="checkbox"/>	<input type="checkbox"/>

**44. Have you taken any measures in order to cope with future potential disasters (natural or man-made)? (yes-no)**

- Yes
- No

**45. To what extent do you feel confident to cope with ....? (one choice for each statement)**

	Confident	Not confident, not unconfident	Unconfident
Banditry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
State action	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Civil unrest / armed conflict	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Natural disaster	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Discrimination	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Part 7: Access to microfinance**

**46. Do you have a loan? (yes-no)**

- Yes
- No (go to Q49)

**47. If the answer of Q46 is “yes”; What is the source of your loan? (one or more answers possible)**

- APED
- Other microfinance institution
- Bank
- Informal network
- Other

**48. If the answer of Q46 is “yes”; Please indicate were the loan is used for: (one or more answers possible)**

To invest in my own business	<input type="checkbox"/>
To invest in agriculture / fishing / livestock	<input type="checkbox"/>
To buy food/clothes for my household	<input type="checkbox"/>

To give or lend money to family members/friends	<input type="checkbox"/>
To keep money on hand in case of emergencies	<input type="checkbox"/>
To repay other debts	<input type="checkbox"/>
To pay school expenses for my children	<input type="checkbox"/>
To improve my house	<input type="checkbox"/>
To pay other items that are not in this list	<input type="checkbox"/>

**49. Do you have savings?** (yes-no)

Savings consists of all ways in which people are saving money.

- Yes  
 No (go to Q52)

**50. If the answer of Q49 is “yes”; Where do you have savings?** (one or more answers possible)

- APED  
 Other microfinance institution  
 Bank  
 Susu  
 Money box  
 Other

**51. If the answer of Q49 is “yes”; Over the last 12 months, has your overall household savings...?** (one answer possible)

- Greatly increased (>20%)  
 Slightly increased (<20%)  
 No change (0%)  
 Slightly decreased (<20%)  
 Greatly decreased (>20%)

**52. If the answer of Q1 is “target group”; Did you participate in any business development training from APED?** (yes-no)

- Yes  
 No

**53. If the answer of Q52 is “yes”; What was the effect of the training?** (multiple choice, one or more answers possible)

- Increased my knowledge in business  
 Keep records of my business  
 Calculate my costs and profit  
 Market my product  
 Other  
 The training did not help me

**54. If the answer of Q1 is “target group”; Do you attend meetings from your APED group? (yes-no)**

Yes

No (go to Q56)

**55. If the answer of Q54 is “yes”; How often do you attend these meetings? (one answer possible)**

Every week

Every two weeks

Every month

Less frequently than every month

**56. Do you have insurances? (yes-no)**

Yes

No (go to Q58)

**57. What kind of insurance do you have? (one or more answers possible)**

Life

Crop

Health

Other

**58. Do you feel more or less confident than 3 years ago? (one answer possible)**

More confident

Equally confident (go to Q60)

Less confident

**59. If the answer of Q46 is “yes” and if the answer of Q58 is “More confident” or “Less Confident”; Do you think this is because of your loan? (yes-no)**

Yes

No

**60. Please indicate whether you test this questionnaire or did a real interview which should be used for the report? (one answer possible)**

This was a test; data should NOT be included in the report

This was a real interview; data should be included in the report

**Thank you!**

## Annex 2 Regression

### Regression analysis

	(1) IncreaseIn~e	(2) IncreaseSa~s	(3) Foodsecure	(4) Meals	(5) AssetIndex	(6) HousingIndex
Treatment	0.139*** (0.0432)	0.210*** (0.0329)	0.0315 (0.0430)	0.173*** (0.0425)	0.0402*** (0.0121)	0.0528*** (0.0166)
_cons	0.608*** (0.0317)	0.630*** (0.0241)	0.684*** (0.0315)	2.660*** (0.0311)	0.340*** (0.00890)	0.535*** (0.0122)
N	458	458	458	458	458	458
R-sq	0.022	0.082	0.001	0.035	0.023	0.022

Standard errors in parentheses

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01

	(1) Enrolment	(2) Noschooldr~s	(3) Healthpers~l	(4) Ill	(5) NoChildren~d
Treatment	0.0354* (0.0191)	0.00571 (0.0236)	0.0153 (0.0321)	-0.0933** (0.0408)	0.0516* (0.0306)
_cons	0.914*** (0.0139)	0.929*** (0.0173)	0.865*** (0.0224)	0.792*** (0.0299)	0.920*** (0.0213)
N	409	458	220	458	220
R-sq	0.008	0.000	0.001	0.011	0.013

Standard errors in parentheses

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01

	(1) Confidence~x	(2) Measuresta~n
Treatment	0.0742** (0.0345)	0.186*** (0.0460)
_cons	0.369*** (0.0253)	0.358*** (0.0337)
N	458	458
R-sq	0.010	0.035

Standard errors in parentheses

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01

	(1) Membership~n	(2) Influentia~n	(3) Leadership~n
Treatment	0.0104 (0.0166)	0.00571 (0.00415)	0.0104 (0.00970)
_cons	0.285*** (0.0122)	0.0110*** (0.00304)	0.0493*** (0.00711)
N	458	458	458
R-sq	0.001	0.004	0.002



Standard errors in parentheses  
 \* p<0.10, \*\* p<0.05, \*\*\* p<0.01

	(1) EconomicEm~t	(2) Reproducti~t	(3) Contracept~t	(4) IncreaseSe~m
Treatment	-0.0142 (0.0411)	0.0207 (0.0205)	0.0451** (0.0176)	0.0674** (0.0263)
_cons	0.750*** (0.0301)	0.939*** (0.0150)	0.939*** (0.0129)	0.719*** (0.0193)
N	458	458	458	458
R-sq	0.000	0.002	0.014	0.014

Standard errors in parentheses  
 \* p<0.10, \*\* p<0.05, \*\*\* p<0.01

### Regression with general characteristics

	(1) IncreaseIn~e	(2) IncreaseSa~s	(3) Foodsecure	(4) Meals	(5) AssetIndex	(6) HousingIndex
Treatment	0.119*** (0.0430)	0.192*** (0.0327)	0.0120 (0.0427)	0.167*** (0.0432)	0.0246** (0.0114)	0.0422*** (0.0144)
Literate	0.0327 (0.0623)	0.0749 (0.0475)	0.0418 (0.0619)	0.0812 (0.0627)	0.0453*** (0.0166)	0.0340 (0.0209)
HigherEduc~n	0.134** (0.0583)	0.0279 (0.0444)	0.159*** (0.0578)	0.0196 (0.0586)	0.00562 (0.0155)	0.0779*** (0.0195)
Couple	0.0955* (0.0536)	0.0413 (0.0408)	0.0208 (0.0532)	0.0885 (0.0539)	0.0606*** (0.0142)	0.0187 (0.0180)
UrbanSemiU~n	0.120*** (0.0442)	0.126*** (0.0337)	0.0928** (0.0439)	0.00453 (0.0445)	0.0636*** (0.0118)	0.141*** (0.0148)
Female	-0.0223 (0.0568)	0.00736 (0.0433)	-0.0372 (0.0564)	0.0181 (0.0571)	-0.0474*** (0.0151)	0.0609*** (0.0190)
_cons	0.439*** (0.0807)	0.510*** (0.0615)	0.583*** (0.0801)	2.540*** (0.0812)	0.293*** (0.0214)	0.372*** (0.0271)
N	458	458	458	458	458	458
R-sq	0.079	0.132	0.063	0.049	0.177	0.296

Standard errors in parentheses  
 \* p<0.10, \*\* p<0.05, \*\*\* p<0.01

	(1) Enrolment	(2) Noschooldr~s	(3) Healthpers~l	(4) Healthpers~l	(5) NoChildren~d
Treatment	0.0349* (0.0193)	-0.000273 (0.0240)	0.0235 (0.0340)	0.0235 (0.0340)	0.0791** (0.0328)
Literate	-0.0104 (0.0284)	-0.00269 (0.0348)	0.0237 (0.0467)	0.0237 (0.0467)	-0.000410 (0.0450)
HigherEduc~n	0.0248 (0.0262)	0.0387 (0.0325)	0.0590 (0.0432)	0.0590 (0.0432)	0.0405 (0.0417)

Couple	0.0576** (0.0247)	0.0438 (0.0299)	0.140*** (0.0531)	0.140*** (0.0531)	0.0452 (0.0512)
UrbanSemiU~n	0.0167 (0.0201)	0.0249 (0.0247)	0.0284 (0.0339)	0.0284 (0.0339)	0.000709 (0.0327)
Female	0.0261 (0.0257)	-0.0200 (0.0317)	0.0772* (0.0407)	0.0772* (0.0407)	0.114*** (0.0393)
_cons	0.833*** (0.0365)	0.886*** (0.0451)	0.635*** (0.0673)	0.635*** (0.0673)	0.764*** (0.0649)
-----					
N	409	458	220	220	220
R-sq	0.028	0.015	0.068	0.068	0.057
-----					

Standard errors in parentheses  
\* p<0.10, \*\* p<0.05, \*\*\* p<0.01

	(1) Confidence~x	(2) Measuresta~n
Treatment	0.0691** (0.0338)	0.160*** (0.0454)
Literate	-0.116** (0.0490)	0.0992 (0.0659)
HigherEduc~n	0.258*** (0.0459)	0.139** (0.0616)
Couple	0.0304 (0.0422)	0.0348 (0.0567)
UrbanSemiU~n	0.00343 (0.0348)	0.0764 (0.0468)
Female	-0.0574 (0.0447)	-0.0815 (0.0600)
_cons	0.314*** (0.0635)	0.282*** (0.0853)
-----		
N	458	458
R-sq	0.093	0.102
-----		

Standard errors in parentheses  
\* p<0.10, \*\* p<0.05, \*\*\* p<0.01

	(1) Membership~n	(2) Influentia~n	(3) Leadership~n
Treatment	0.0138 (0.0169)	0.00252 (0.00415)	-0.000377 (0.00920)
Literate	-0.0542** (0.0245)	0.00262 (0.00602)	0.0267** (0.0133)
HigherEduc~n	0.0492** (0.0229)	-0.00291 (0.00563)	0.00677 (0.0125)
Couple	0.00531 (0.0211)	0.00551 (0.00518)	0.0171 (0.0115)
UrbanSemiU~n	0.0141 (0.0174)	0.0180*** (0.00427)	-0.00228 (0.00947)

Female	0.0205 (0.0223)	-0.0111** (0.00548)	-0.0768*** (0.0122)
_cons	0.252*** (0.0317)	0.0100 (0.00780)	0.0916*** (0.0173)

N	458	458	458
R-sq	0.019	0.050	0.144

Standard errors in parentheses  
\* p<0.10, \*\* p<0.05, \*\*\* p<0.01

	(1) EconomicEm~t	(2) Reproducti~t	(3) Contracept~t	(4) IncreaseSe~m
Treatment	0.0247 (0.0402)	0.0221 (0.0210)	0.0456** (0.0180)	0.0623** (0.0266)
Literate	-0.00392 (0.0582)	0.0132 (0.0304)	-0.000248 (0.0261)	-0.00129 (0.0385)
HigherEduc~n	0.0873 (0.0545)	-0.0197 (0.0284)	-0.0128 (0.0244)	0.0819** (0.0360)
Couple	-0.0809 (0.0501)	0.00870 (0.0261)	-0.00871 (0.0225)	0.0689** (0.0331)
UrbanSemiU~n	-0.0215 (0.0413)	0.00387 (0.0216)	-0.0182 (0.0186)	0.00152 (0.0273)
Female	0.324*** (0.0531)	0.0206 (0.0277)	-0.0137 (0.0238)	-0.0189 (0.0351)
_cons	0.507*** (0.0754)	0.917*** (0.0394)	0.970*** (0.0338)	0.644*** (0.0499)
N	458	458	458	458
R-sq	0.090	0.005	0.019	0.046

Standard errors in parentheses  
\* p<0.10, \*\* p<0.05, \*\*\* p<0.01

# Annex 3 Propensity Score Matching

The sample size of the different probit models varied over the different rights. However, most of them are comparable and therefore the common probit regression is included in the appendix.

\*\*\*\*\*  
 Algorithm to estimate the propensity score  
 \*\*\*\*\*

The treatment is Treatment

Treatment	Freq.	Percent	Cum.
0	212	46.29	46.29
1	246	53.71	100.00
Total	458	100.00	

Estimation of the propensity score

Iteration 0: log likelihood = -316.19824  
 Iteration 1: log likelihood = -307.50427  
 Iteration 2: log likelihood = -307.4947

Probit regression	Number of obs	=	458
	LR chi2(5)	=	17.41
	Prob > chi2	=	0.0038
Log likelihood = -307.4947	Pseudo R2	=	0.0275

Treatment	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
UrbanSemiU~n	.3197694	.1242597	2.57	0.010	.0762249 .563314
Literate	.1732588	.1749632	0.99	0.322	-.1696628 .5161805
HigherEduc~n	-.2113172	.1636411	-1.29	0.197	-.532048 .1094135
Couple	.0471315	.1507377	0.31	0.755	-.2483089 .3425719
Female	-.5110817	.1622837	-3.15	0.002	-.8291518 -.1930115
_cons	.3714675	.2166757	1.71	0.086	-.0532091 .796144

Note: the common support option has been selected  
 The region of common support is [.36281989, .76985469]

Description of the estimated propensity score  
 in region of common support

Estimated propensity score				
Percentiles	Smallest			
1%	.3806402	.3628199		
5%	.3806402	.3628199		
10%	.4444824	.3628199	Obs	458
25%	.4631573	.3806402	Sum of Wgt.	458
50%	.53219		Mean	.5372799
		Largest	Std. Dev.	.0962986
75%	.5898996	.7698547		
90%	.6622454	.7698547	Variance	.0092734
95%	.7431794	.7698547	Skewness	.4567623
99%	.7581331	.7698547	Kurtosis	2.505554

\*\*\*\*\*  
 Step 1: Identification of the optimal number of blocks  
 Use option detail if you want more detailed output  
 \*\*\*\*\*

The final number of blocks is 4

This number of blocks ensures that the mean propensity score is not different for treated and controls in each blocks

```
*****
Step 2: Test of balancing property of the propensity score
Use option detail if you want more detailed output
*****
```

The balancing property is satisfied

This table shows the inferior bound, the number of treated and the number of controls for each block

Inferior of block of pscore	Treatment		Total
	0	1	
.2	15	12	27
.4	170	171	341
.6	27	63	90
Total	212	246	458

Note: the common support option has been selected

```
*****
End of the algorithm to estimate the pscore
*****
```

## Probit Microfinance

	Probit controlNL	Health Personnel controlNL	Probit Enrollment controlNL
UrbanSemi1	0.320** (0.124)	0.477** (0.193)	0.331** (0.132)
Literate1	0.173 (0.175)	0.663** (0.270)	0.0800 (0.187)
HigherEdu	-0.211 (0.164)	-0.786*** (0.252)	-0.146 (0.172)
Couple	0.0471 (0.151)	0.459 (0.307)	0.0829 (0.163)
Female1	-0.511*** (0.162)	-1.018*** (0.232)	-0.493*** (0.172)
_cons	0.371* (0.217)	0.274 (0.374)	0.311 (0.230)
N	458	220	409
R-sq	0.0275	0.1179	0.0252

Standard errors in parentheses  
\* p<0.10, \*\* p<0.05, \*\*\* p<0.01

## Probit women

	Probit controlNL	Health Personnel controlNL	Probit Enrollment controlNL
UrbanSemi1	0.302** (0.135)	0.376* (0.206)	0.311** (0.144)
Literate1	0.142 (0.193)	0.542* (0.306)	0.0729 (0.208)
HigherEdu	-0.101 (0.174)	-0.607** (0.272)	-0.0390 (0.184)
Couple	0.0380 (0.162)	0.405 (0.325)	0.0398 (0.174)
_cons	-0.159 (0.165)	-0.684** (0.336)	-0.176 (0.174)
N	365	166	326
R-sq	0.0114	0.0414	0.0113

Standard errors in parentheses

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01

## Probit rural areas

	Probit controlNL	Health Personnel controlNL	Probit Enrollment controlNL
Literate1	0.364 (0.241)	0.641* (0.362)	0.178 (0.251)
HigherEdu	-0.188 (0.220)	-0.722** (0.334)	-0.128 (0.227)
Couple	0.0599 (0.208)	0.894* (0.468)	0.0384 (0.217)
Female1	-0.433** (0.197)	-0.878*** (0.261)	-0.456** (0.206)
_cons	0.239 (0.275)	0.245 (0.506)	0.286 (0.288)
N	266	245	245
R-sq	0.0276	0.1212	0.0211

Standard errors in parentheses

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01