Can micro-finance help small farmers in developing countries improve their livelihoods?

A Systematic Review

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i. Acknowledgements

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ii. Executive Summary

Agriculture remains the largest employment sector in most developing countries, and smallholder farmers in these countries produce a large portion of the world’s food. Lack of financial services, however, seriously threatens their ability to meet increasing global demand. Without access, many of these farmers are unable to adopt the most productivity-enhancing practices, and as a result, will continue to engage in low-return, subsistence-oriented production practices that lack diversification and undermine rural livelihood strategies. Ultimately, food-insecurities have serious local and global implications on human security, and are also likely to persist given the anticipated increase in the world’s population and middle class, subsequent stress on natural resources, and climate change. Therefore, access to financial services is foundational to sustainable agricultural development.

Public and private sector funding for micro-finance from has grown, emphasizing its importance in the international community as a tool for addressing the Millennium Development Goals (MDGs). Increases in public funding under tightening budget environments stress the importance of rigorous evidence for strategic planning and decision-making. Thus, this systematic review is an important step in identifying the impact of micro-finance interventions and which are best suited to increase farmers’ livelihoods. By identifying best practices, future program developers and other groups will not only be able to make more informed decisions, but, by minimizing aspects of micro-finance that are less beneficial, resources will be freed to assist and invest in other areas.

Our synthesis finds that micro-credit tended to increase farmer’s livelihoods by allowing them to adopt new and improved techniques and technologies, and purchase
higher quality and larger quantities of inputs. This led to higher levels of productivity, which often translated into higher agricultural sales and income, and directly affected consumption and asset growth. Furthermore, we find that micro-insurance helps mitigate risk by supplementing and strengthening the effects of micro-credit, while protecting farmers from the inherent risk of entrepreneurial activities. Our synthesis on micro-savings and financial services training, however, finds much less evidence of significant impacts.

We also note that an overarching pattern becomes apparent. This pattern—or theme— is that of income stratification. Positive impacts from micro-finance interventions are more consistently associated with farmers who are better off from the start; smaller and lower-income farmers do not appear to always benefit significantly from micro-finance programs. Taken together, this implies that while micro-finance has the potential to improve farmer livelihood, smaller farmers may lack the complementary resources to benefit from it because MFIs have yet to adapt to their financial needs.
1. Background

Micro-finance is commonly understood as the supply of financial services to individuals or groups that would otherwise lack access to traditional banking services. It offers a variety of products and services, such as “micro-credit,” “micro-savings,” “micro-insurance,” and financial services training. These services are primarily provided to micro-entrepreneurs, low-income individuals and the poor, and are seen as reducing and mitigating risks and vulnerabilities most likely to be experienced by these groups (Hulme et al., 2009).

Governments often redirect public subsidies toward creating micro-finance institutions (MFIs) to enhance financial inclusion because, in theory, they have the potential to enable investment in income-generating activities, consumption smoothing, and financial planning (Stewart et. al., 2012). As such, funding for micro-finance from the public and private sector has grown, emphasizing the importance of micro-finance in the international community as a tool for addressing the MDGs and economic growth. According to the Consultative Group to Assist the Poor (CGAP, 2013)—a World Bank branch—funds for micro-finance increased 12% between 2011 and 2012, totaling $29 billion in 2012 (please refer to Appendix 1). Between 2011 and 2012, increases in public funding for financial service providers (FSPs) increased at a higher rate than private sector funding, 16% and 2%, respectively (please refer to Appendix 2). Public funding increases under increasingly tight budget environments stress the importance of rigorous evidence for strategic planning and decision-making. The CGAP states, “There is mounting evidence to show that the availability of financial services for poor households can help achieve the MDGs.” However, despite micro-finance’s popularity, there is growing concern that its
impacts are poorly understood. Furthermore, its emphasis on financial inclusion and depth of outreach has led to a lack interest in micro-finance towards agriculture.

Ultimately, food-insecurities in developing countries have serious local and global implications for human security. During the 2009 World Food Prize International Symposium, which was themed “Food, Agriculture, and National Security in a Globalized World,” Raymond Gilpin (United States Institute of Peace Director of Center for Sustainable Economies) drew the following analogy:

We don’t really take time to understand how higher food prices ratcheted up domestic spending, particularly among the poor, and led not just to income poverty in rural areas, but asset poverty. The asset poverty made it impossible for most households to remain in rural areas and led to mass migration out of the breadbaskets of most countries. This not only accentuated poverty but also made it more difficult for these countries to have prospects for being able to feed themselves in the outer years. And displacement of population in itself constitutes a human-security challenge. Last year saw a number of riots; in many countries people lost their lives. But it was relatively easy for most governments to quell these riots because they blamed it on a global phenomenon: rising commodity prices. [...] And more likely there will be violence associated with competition for these resources, which will certainly take political coloring.

Thus, this systematic review is an important step in identifying the impact of different micro-finance interventions and which are best suited to increase farmers’ livelihoods. It employs a replicable, rigorous and structured approach to identifying, selecting and synthesizing relevant evidence on the topic. By identifying best practices, current and
future program developers, public and private donors, and MFIs will not only be able to make more informed decisions, but by minimizing aspects of micro-finance that are less beneficial, resources will be freed to assist and invest in other areas.

2. Conceptual Framework

The following conceptual framework highlights the general nuances of the micro-finance debate, and delves into the nexus between micro-finance and farmers’ livelihoods.

The question of whether expansion of financial services can reduce poverty has long been of interest to economists and policymakers. A large theoretical body of literature identifies different mechanisms through which access to such services can enable individuals to alter their production and employment choices, and thus escape poverty. According to the United Nations Capital Development Fund (UNCDF)(2004), micro-finance plays three key roles in development: (1) it helps very poor households meet basic needs and protects against risks; (2) it is associated with improvements in household economic welfare; and (3) it promotes gender equity by empowering women to engage in economic participation. In December 2011, the UNCDF even explored micro-finance as a tool for social protection through savings.

Proponents of micro-finance argue that it creates access to productive capital for the poor, which, together with human capital (addressed through education and training) and social capital (achieved through local organization building) enables people to pull themselves out of poverty. “By providing material capital to a poor person, their sense of dignity is strengthened and this can help to empower the person to participate in the economy and society” (Otero, 1999). Advocates further suggest that micro-finance is not just about combating poverty at an individual level; it also has a role at an institutional
level, as it seeks to create institutions that deliver financial services to those who are continuously ignored by the formal banking sector. Littlefield and Rosenberg (2004) state “the poor are generally excluded from the financial services sector of the economy so MFIs have emerged to address this market failure.” The reluctance of banks to lend to people without collateral has the potential to cause poverty traps (Banerjee and Newman, 1993). By addressing this gap in the market in a financially sustainable manner, MFIs can become part of the formal financial system of a country, gaining access to capital markets to fund their lending portfolios, allowing them to dramatically increase the number of poor people they can reach (Otero, 1999).

Many studies, however, suggest there is a lack of rigorous evidence to support the claim that micro-finance interventions in general have positive impacts on their recipients (e.g. Banerjee et al., 2009; Roodman & Morduch, 2009; Karlan & Zinman, 2009; Bateman & Chang, 2009; Dichter & Harper, 2007; Rashid & Townsend, 1993). While early evaluations suggested these interventions were promising, most recent evidence is less clear-cut regarding their effects. The results of the first three randomized controlled trials (RCTs) on micro-credit in India, Kenya, and the Philippines, by the Massachusetts Institute of Technology (MIT)’s Jameel Poverty Action Lab (J-PAL), raised questions about the impact of micro-finance on improving the lives of the poor (Banerjee et al., 2009; Dupas & Robinson, 2009; Karlan & Zinman, 2010). The studies indicated they found no strong causal link between increased access to micro-finance and poverty reduction or social well-being for the poor. Hulme and Mosley (1996), while acknowledging the role micro-finance can have in helping to reduce poverty, concluded from their research that “most contemporary schemes are less effective than they might be.” They state that micro-finance is not a
panacea for poverty alleviation and, in some cases, the poorest people have been made worse-off by micro-finance. Similarly, Burgess & Pande (2005) state, “Formal subsidized credit has been ineffective in reaching the poor, and may even undermine rural development and increase rural poverty.” These skeptics suggest that MFIs encourage a single-sector approach to the allocation of resources to fight poverty, and are irrelevant to the poorest people because they use an over-simplistic notion of poverty (Rosaly, 1996).

According to Wright (2000), interventions generally have a limited effect on income because MFIs often fail to provide additional services desperately needed by the poor, i.e. micro-savings, who have less capacity to absorb risk. Thus, both access to micro-finance and the return from investments to borrowers promoted by MFIs could differ across households with differing poverty profiles (Liverpool & Winter-Nelson, 2009).

As it relates to this review, micro-finance’s general focus has been towards financial inclusion (particularly for women) and depth of outreach (particularly for the poor). This emphasis on financial inclusion instead of financing a specific sector has led to low interest in micro-finance towards agriculture, and in rural areas, a low adaptation of financial services to small farmer’s financial needs (Armendariz & Labie, 2011). This has been starkly noticeable in the role of interest rates. Loans below a certain size lose money at a particular interest rate; loans above that size generate a profit (Please refer to Appendix 3). In order to achieve financial sustainability, MFIs have had to adopt high, cost-covering interest rates—in 2011, the global median interest rate was 27 percent (CGAP, 2011) (Please refer to Appendix 4). Financial services are necessary for the development of agriculture, farmers and rural areas, and are an effective means of promoting rural consumption growth. Despite high interest rates, however, access has also been a major
issue; finance is limited in rural areas compared with urban areas. Rural areas have few financial institution branches, insufficient competition, and poor financial service (Asian Development Bank, 2010).

Today, agriculture constitutes an important part of developing countries’ GDP and a large part of rural households’ monetary income (FAO, 2006; World Development Report, 2008). Smallholder farmers manage over 80% of the world’s estimated 500 million small farms and provide over 80% of the food consumed in a large part of the developing world, contributing significantly to poverty reduction and food security (United Nations Environment Programme, 2013). The Food and Agriculture Organization of the United Nations (FAO)(2012) estimates that global food production must increase by 60% by 2050 to meet population growth and growth in the global middle-class. According to official United Nations population estimates and projections (2013), the current world population of 7.2 billion is projected to increase to 9.6 billion in 2050. Similarly, the Organization for Economic Cooperation and Development (OECD) (2012) estimates the current global middle class will grow from 1.8 billion people to 4.9 billion by 2030. Under current production patterns, much of the increase would need to come from these smallholder farmers. However, lack of financial services severely constrains sustainable agricultural development, which threatens their ability to meet this fast growing demand. Moreover, the more rural populations contribute to GDP, and the greater the percentage of agricultural workers, the lower the rate of financial inclusion (Morvant-Roux, 2008) (Please refer to Appendix 5 & 6). Without access to financial services, many of the cash-starved farmers who dominate the rural landscape are unable to adopt the most productivity-enhancing practices. As a result, farmers continue to engage in low-return,
subsistence-oriented production practices that lack diversification and undermine rural livelihood strategies (Rweyemamu et al., 2003).

At the household level, access to financial services would allow farmers to save their cash reserves efficiently to better protect themselves from shocks before they occur, and increase liquid assets to smooth consumption against income shocks. At the enterprise level, it would allow them to improve infrastructural systems to support their on-farm production, increase their use of improved agricultural techniques and technologies, establish producer cooperatives, and develop agricultural value chains (Saweda & Winter-Nelson, 2009). The availability of financial services could help ensure that farmers are able to maintain and improve their income, assets, consumption, and social well-being from year to year, while providing them the means to protect their livelihoods against shocks, and build up and diversify their livelihood activities, thus, endeavoring to improve underserved market segments by systematically reviewing the impact(s) of micro-finance interventions is critical.

Feder et al. (1991) were among the first authors to describe credit constraints and their relation to agricultural productivity. According to them:

Financial services are an important element in agricultural production systems. It allows farmers to satisfy the cash needs induced by the production cycle (preparation, planting, cultivation and harvesting of crops), which are typically done over a period of several months in which very little income is earned, while expenditures on materials, purchased inputs and consumption need to be made in cash. Income is received a short time after the harvest; in the absence of
credit markets, farmers would have to maintain cash reserves so as to facilitate production and consumption in the next cycle.

Although farmers that have a cash-generating enterprise or have access to cultivable land are not among the extremely poor or destitute, smallholder farmers in rural areas are more vulnerable to slipping into poverty. Thus, the availability of financial services in these areas should allow them to better mitigate risks. In their study, Burgess and Panda (2005) explore the policy-driven nature of bank branch expansion across Indian states. They find that branch expansion to rural areas, savings mobilization, and credit disbursements increased total per capita output. However, non-agricultural output and, in particular, small-scale manufacturing and services were most affected by rural branch expansion. This alludes to the low adaptation of financial services to farmer’s financial needs.

Zohir and Matin (2004) find that micro-loans used for agricultural production, trading, processing, and transport result in an increase in the use of agricultural inputs and increased output of agricultural production. Micro-loans have shown to enhance employment opportunities in these sectors for the wider community, increase incomes, and reduce the prices of agricultural outputs due to increased supply. Other studies, however, note that the sum of credit typically obtained by farmers does not contribute positively to the level of output as a result of non-judicious utilization, or a distraction of credits obtained for other uses apart from the intended farm enterprises (Feder et al., 1991; Foltz, 2005; Saweda & Winter-Nelson, 2009). Often these funds are used for consumption and income smoothing as a result of the typical nature in production cycles. Crépon et al. (2013) found that despite significant increases in self-employment income, there was no net impact from access to micro-credit on total labor income, or on
consumption. However, they suggest that it appears to be driven by a loss in income from wage labor, which is large enough to offset the gain in self-employment income, and is directly related to a substantial decline in labor supply outside the home by those who take up micro-credit.

These discrepancies clearly highlight how some of the resources for long-term investments, possible through credit access, and may be partially destined for short-term needs, or conversely, how short-term resources may be destined for long-term investments. Such a mixing and matching of short-term and long-term investments implies that the results of an investment in the first year of its use may be difficult to discern in a single year of aggregate production data. Thus, the effect of that investment remains less evident, as it takes many different forms that may not produce meaningful results in the short-term (Feder, et al., 1991; Foltz, 2005; Berhane & Gardebroek, 2010). This underscores the need for supplemental products and services such as savings, insurance, and training, as well as the need for more time-driven studies to capture richer data.

Lack of access to financial services often keeps small farmers struggling through production and consumption cycles. In order to ease these cycles, farmers must apply daily cost-and-benefit analyses to properly mitigate short-term versus long-term needs. MFIs have sought to address this issue by applying compulsory savings clauses within the terms of the loans. In 2011, about a third of micro-borrowers were served by lenders that required them to maintain a percentage of their loan on deposit with the lender. Many times, however, this may sound better in theory than in practice as such conditions often raise the effective interest rate by reducing the net loan disbursement that the borrower
can actually use, while the borrower pays interest on the full loan amount (Rosenberg et al., 2013).

Lack of access to formal financial services also prevents potential entrepreneurs from obtaining the necessary capital to start or expand their businesses, forcing them to either stay in traditional farming or take other, less profitable paths. Similarly, lack of access to formal insurance can prevent farmers from pursuing production activities that may be risky but have potentially large returns (Cai et al., 2010). A large amount of resources have been supplied to provide credit to individuals in low-income regions, however, there has been much less effort to provide micro-insurance. As Morduch (2006) observed:

The prospects of micro-insurance are exciting, but much remains unknown. The expanding gaggles of micro-insurance advocates are ahead of the available evidence on insurance impacts... The advocates may be right, at least in the long-term, but it is impossible to point to a broad range of great evidence on which to base that prejudice.

Cai et al. (2012) suggest that micro-insurance may be as important as micro-credit because it can supplement and strengthen its effects by protecting farmers from the inherent risk of entrepreneurial activities. It can protect farmers against losses when bad weather harms their harvest (e.g. climactic events such as hail, drought, and floods) or against losses due to declines in the prices of agricultural commodities. Micro-insurance also encourages farmers to buy higher quality products such as more resilient seed varieties, and invest in fertilizer and other inputs. This can improve agricultural productivity and boost farmer’s livelihoods. In the absence of formal insurance services,
smallholder farmers often purchase lumpy assets, such as livestock, as substitutes for formal risk-management strategies (Deaton, 1991; Rosenzweig & Wolpin, 1993).

Similarly, there has also been much less effort to provide financial services training, and even less effort to understand its long-term impacts on farmers. Careful management of what little money smallholder farmers have is critical to meet day-to-day needs, mitigate unexpected risks, and take advantage of opportunities when they come along. The purpose of financial services training is to teach borrowers the significance of money and how to manage it wisely. It offers them the opportunity to learn basic skills related to earning, spending, budgeting, saving, and borrowing (Cohen & Sebstad, 2003). They typically emphasize high-value crops, and crop and market diversification, while using market-driven approaches to enable farmers to implement technologies that increase yields, quality, and competitiveness (NORC, 2012). According to Blair et al. (2012), there is strong evidence to suggest that the offer (and delivery) of financial services training significantly raises individuals’ productive incomes. Conversely, other studies have noted that there is no evidence that this type of intervention has positive impacts on crop yields and crop incomes. Carter, Toledo, & Tjernström (2012) observed that mixed trends where consumption initially dips and then shows modest, long-term increases, while income in the activities targeted by the training program rise, but show decreasing patterns when the intervention came to an end. However, farmers with some form of financial training were more likely to apply for loans from more formal sources, suggesting that the training had equipped them with the confidence to engage more formal sources of finance (ISSER, 2012).
The studies investigated for this systematic review exhibit varied results. They suggest that micro-finance can be a powerful enabler of economic activity, but has not been able to unlock its full potential, due to the fact that it lacks an agricultural-specific focus. Many studies suggest that despite its inclusive focus, micro-finance has allowed farmers in developing countries to better their practices and enterprises—and their livelihoods in the process. Other studies note otherwise. Whether these discrepancies reflect differences in the way the studies were implemented or evaluated, a lack of long-term understanding of the impacts still exists due to the many challenges associated with conducting rigorous and extensive research. Conclusively, given the many nuances surrounding micro-finance, the question still remains: can micro-finance help farmers in developing countries improve their livelihoods?

3. Evaluation Matrix and Parameters

(Please refer to Appendix 7 for visual diagrams)

3.1 Interventions

Our evaluation matrix consists of understanding whether micro-finance can help improve the livelihoods of farmers in developing countries. We are interested in observing the impact of several types of micro-finance interventions, specifically micro-credit, micro-savings, micro-insurance, and financial services training. Specifically, we focus on these different types of interventions:

- Micro-Credit: the extension of small loans to low-income individuals who typically lack collateral, steady employment, and a verifiable credit history (Balasubramanian, Kumar, & Subramanian, 2012).
• Micro-Savings: a product that consists of a small deposit account offered to low-income individuals as an incentive to store funds for future use. Often, minimum balance requirements are waived, or are very low, allowing users to save small amounts of money and not be charged for the service (Balasubramanian, Kumar, & Subramanian, 2012).

• Micro-Insurance: a product that offers protection to low-income individuals against specific perils in exchange for a regular premium payment proportionate to the likelihood and cost of the risks involved (Churchill, 2006). Micro-insurance may be offered for a wide variety of risks, including health risks (illness, injury, or death) and property risks (damage or loss). A wide variety of micro-insurance products exist to address these risks, including crop insurance, livestock insurance, insurance against theft or fire, health insurance, term life insurance, death insurance, disability insurance, and insurance against natural disasters, among many other (Balasubramanian, Kumar, & Subramanian, 2012).

• Financial Services Training: a service that accelerates the development of commercial and financial skills. It helps recipients successfully transition to higher-profit activities, generate new investment, expand markets, sales, and labor.

3.2 Population of Interest

The impacts of these interventions will be evaluated in relation to smallholder farmers and small and micro-enterprises (SMEs) in developing countries. The following descriptions detail the two main types:
• Smallholder Farmer: small-scale farmers characterized by family-focused motives, using mainly family labor for production and using part of the produce for family consumption (FAO, 2012).

• Small and Micro-Enterprises: small businesses that employ small numbers of employees (they usually operate with fewer than 10 people), and require small amounts of capital to start; however, they typically lack access to formal financial services.

3.3 Inclusion Criteria

The inclusion criteria for this systematic review focuses primarily on synthesizing impact evaluations, particularly those with:

• Experimental designs such as randomized control trials, which seek to determine a causal relationship between an intervention and its outcomes by establishing counterfactual based on a comparison of randomly assigned treatment and control groups.

• Quasi-experimental designs utilizing different methodologies including propensity score matching and instrumental variables to compensate for lack of randomization.

• Descriptive designs utilizing panel data from one-time interactions with individuals or groups (cross-sectional) or interactions over time (time-series).

3.4 Outcomes of Interest

(Please refer to Appendix 8 & 9 for visual diagrams)

Our outcome of interest is that of improved livelihoods, which we will measure using the following indicators: productivity, sales, income, assets, and consumption. The following describes each indicator and its causal pathway towards improving livelihood:
• Productivity: the ratio of output to inputs in production. Increasing productivity can lead to increasing the levels of outputs, or sales. Efficiency of production means production’s capability to create incomes (WebFinance, Inc., 2011).

• Sales: the act of selling a product or service in return for money or other compensation. It is the beginning of an engagement between customer and vendor or the extension of that engagement. Higher sales can translate into higher incomes.

• Income: the sum of all the wages, salaries, profits, interests payments, rents, and other forms of earnings received in a given period of time (Case & Fair, 2007). It represents all the combinations of goods and services that a consumer may purchase given current prices. Higher incomes give individuals purchasing power, which helps increase consumption expenditure levels.

• Consumption: the use of goods and services by households. Consumption expenditure patterns vary in relation to income levels, and determine aggregate saving because saving is defined as the portion of income that is not consumed (Encyclopædia Britannica Inc., 2012). However, some consumption expenditures may also translate into forms of assets (livestock).

• Asset: an economic resource. Anything tangible or intangible that is capable of being owned or controlled to produce value and that is held to have positive economic value is considered an asset. Simply stated, assets represent value of ownership that can be converted into cash (although cash itself is also considered an asset). This includes inventory, buildings, equipment, and infrastructure. Livelihood is contingent on a household’s access to a minimum bundle of assets and access to markets to further accumulate assets (Adato, Carter, & May 2006).
4. Methodology

4.1 Identification of Potential Studies

The impact evaluations synthesized in this systematic review were selected based on their rigor in demonstrating that the results of the interventions can be reasonably attributed to the program that was being implemented. They also met our evaluation’s matrix and parameters:

- They evaluated one or several of the interventions we are interested in observing.
- They were tailored to or included our desired population of interest.
- They employed one of our preferred study designs.
- They exhibited one or several variations of impacts in relation to our outcomes of interest.

4.2 Searches

Searches for impact evaluations were conducted in the following institutional databases:

- Asian Economic and Financial Review
- Bureau for Research and Economic Analysis of Development (BREAD)
- Center for Global Development (CGD)
- Consultative Group to Assist the Poor (CGAP)
- Evidence for Policy and Practice Information and Coordinating Centre (EPPI-Centre)
- Food and Agriculture Organization of the United Nations (FAO)
- Institute of Statistical, Social and Economic Research (ISSER)
- Inter-American Development Bank (IDB)
• International Food Policy Research Institute (IFPRI)
• Macrothink Institute
• Millennium Challenge Corporation (MCC)
• National Opinion Research Center (NORC)
• United States Aid for International Development (USAID)
• World Bank Development Impact Evaluation Initiative (DIME)
• World Bank Policy Research Papers

Searches were also conducted in relevant academic journals and other repositories of impact evaluations including:

• International Initiative for Impact Evaluation (3ie)
• European Journal of Business and Management
• Journal of Agricultural Economics
• Journal of Agriculture, Food Systems, and Community Development
• Journal of Development Economics
• Journal of Development Studies
• Journal of International Development
• Journal of Sustainable Development
• Microfinance Gateway
• MIT Poverty Action Lab (J-PAL)

4.3 **Addressing Issues of Validity, Reliability, and Quality**

Many studies were excluded on more easily judged characteristics; however, we immediately excluded a study if it lacked:

• clarity in the description of the program, data, methods, and/or design
• appropriate methodology for sampling, data collection, and analysis
• properly assigned treatment and control groups
• acceptable strategies for causal identification
• controls for omitted variables in case of non-randomization
• a sound process ensuring accuracy of the estimated impacts

4.4 Study Designs

Of the impact evaluations used, ten have experimental designs that employ randomized controlled trials, which are widely accepted for measuring outcomes and impacts because they are designed to show attribution of the outcomes/impacts to the intervention(s); three evaluations compensate for non-randomization by employing quasi-experimental designs that use impact estimation methods such as propensity score matching and instrumental variables; and eight evaluations have descriptive designs, three of which utilize cross-sectional data collected from a population or a representative subset at one specific point in time, and five which utilize time-series data, which observe and compare the subject’s changes over time.

4.5 Design Limitations, and Risk of Biases

Experimental Design

Experimental designs, such as randomized control trials (RCTs), are considered the most rigorous way of determining whether a cause-effect relationship exists in treatment groups. Randomized control trials, while strong in internal validity are often weak in external validity, challenging the ability to generalize the results in different country, cultural, and operating environments. This is particularly important in the interpretation and use of study findings when considering replication of interventions to different
countries and beneficiaries. In this case, additional knowledge and information on the implementing environment and beneficiary population should be considered.

*Quasi-Experimental Design*

Quasi-experimental designs, such as propensity score matching, difference-in-difference, and regression discontinuity are used when randomization is impractical and/or unethical, and are typically easier to set up than randomized control trials. However, causal relationships are difficult to determine due to a variety of extraneous and confounding variables that exist in a social environment.

*Descriptive Design*

Descriptive designs collect data without changing the environment (i.e., nothing is manipulated). They can involve a one-time interaction with groups of people (cross-sectional) or repeated cross-sections. A study might also follow individuals over time (time-series or panel). However, for these studies to be extremely useful in assessing the effects of an intervention on outcomes of interest, they require several iterations of data collection. They are also often susceptible to common sources of bias, of which selection and self-selection are of prime concern.

4.6 *Data Synthesis*

Differences in study design, participants, methods of implementation, theoretical underpinnings, outcomes, and indicators are major contributions to the complexity and the heterogeneity of the synthesis stage. Thus, our data synthesis consists of a narrative analysis that follows an iterative approach for drawing comparisons between the study question and the many different results. It develops a preliminary synthesis of the findings (by intervention type), explores the relationships in the data, and highlights the key
findings and any major themes found. We have placed careful judgment as needed when integrating different types of evidence.
## 5. Summary of Studies Reviewed

<table>
<thead>
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<th>Title of Study</th>
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<th>Evaluation Design</th>
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<th>Outcomes Measured</th>
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<tr>
<td>Credit's Effect on Productivity in Chinese Agriculture: A Microeconomic Model of Disequilibrium</td>
<td>Gershon Feder; Lawrence J. Lau; Justin Y. Lin; and Xiaopeng Luo, 1991</td>
<td>China</td>
<td>Smallholder farmers</td>
<td>Credit</td>
<td>1987</td>
<td>145 borrowers</td>
<td>Descriptive Design</td>
<td>Cross-Sectional Regressions, Linear Regression Model</td>
<td>A</td>
</tr>
<tr>
<td>The Impacts of Credit on Village Economies</td>
<td>Joseph P. Kaboski and Robert M. Townsend, 2009</td>
<td>Thailand</td>
<td>Smallholder farmers</td>
<td>Credit</td>
<td>1997-2001, 2002-03</td>
<td>Seven years of panel data on 960 households across 64 villages is used. The first five years of data give a before picture of the environment, while the final two years give the ability to look at the effects of the program on levels and growth rates of relevant outcome variables.</td>
<td>Descriptive Design</td>
<td>Time-Series Regressions, Panel data estimation (Fixed effects with Instrumental variables)</td>
<td>A, C, D, E</td>
</tr>
<tr>
<td>Does Microfinance Reduce Rural Poverty? Evidence Based On Household Panel Data From Northern Ethiopia</td>
<td>Guush Berhane And Cornelis Gardebroek, 2009</td>
<td>Ethiopia</td>
<td>Smallholder farmers</td>
<td>Credit</td>
<td>1997-2006</td>
<td>In the survey, 400 households were selected from 16 villages (out of the 100 villages), which in turn were selected from 11 districts in four main zones of the region. Twenty-five households were selected from each village, randomized at village and household levels.</td>
<td>Descriptive Design</td>
<td>Time-Series Regressions, Panel data estimation (Fixed effects, random trend models)</td>
<td>D, E</td>
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<tr>
<td>Title</td>
<td>Authors</td>
<td>Country</td>
<td>Type of Farmers</td>
<td>Decision Variable</td>
<td>Year</td>
<td>Description</td>
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<tr>
<td>Impact Of Institutional Credit On Production Efficiency Of Farming Sector: A Case Study Of District Faisalabad</td>
<td>Saima Ayaz and Zakir Hussain, 2011</td>
<td>Pakistan</td>
<td>Smallholder farmers, small and micro-enterprises</td>
<td>Credit</td>
<td>2009</td>
<td>A sample data of 300 rural farmers were collected from two districts. In each, 150 farming households were interviewed, which were further divided into two categories, credit users and non-users of credit.</td>
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<tr>
<td>Credit Market Constraints And Profitability In Tunisian Agriculture</td>
<td>Jeremy Foltz, 2004</td>
<td>Tunisia</td>
<td>Smallholder farmers, small and micro-enterprises</td>
<td>Credit</td>
<td>1995</td>
<td>Surveyors interviewed a total of 142 farmers in 5 different towns. Of the 142 original farmers surveyed, 6 were dropped for missing data and unanswered questions. No significant patterns were found among those dropped from data set.</td>
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<tr>
<td>Impact of Microfinance on Smallholder Farm Productivity in Tanzania: The Case of Iramba District</td>
<td>Frank Girabi and Agnes Godfrey Mwakaje, 2013</td>
<td>Tanzania</td>
<td>Smallholder farmers</td>
<td>Credit</td>
<td>February-April 2010</td>
<td>Households were categorized into CB (47%) and NCB (53%). To make it gender equitable within each category farmers were further grouped into men and women. In each category, 5% of the households were selected randomly making a total of 96 sample size. The collection of primary data involved three phases. The first phase focused on key informant discussion. Second phase concentrated on focus group discussion. The discussion comprised of 10 people. Finally, questionnaire interviews were undertaken.</td>
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<tr>
<td>Insurance, credit, and technology adoption: field experimental evidence from Malawi</td>
<td>Xavier Giné and Dean Yang, 2009</td>
<td>Malawi</td>
<td>Smallholder farmers</td>
<td>Credit, Insurance</td>
<td>2006</td>
<td>787 farmers agreed to be part of the study and were available to be surveyed at a later time. The treatments were randomized at the level of 32 localities. Localities were randomized into two equal sized groups: 16 “uninsured” (control) localities and 16 insured (treatment) localities. The 394 farmers from “uninsured” localities were offered a loan for the hybrid seeds, while the 393 farmers from “insured” localities were not only offered the loan for the hybrid seeds but they also received a rainfall insurance policy with an approximately actuarially fair premium.</td>
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<tr>
<td>Study Title</td>
<td>Authors</td>
<td>Country</td>
<td>Sample Description</td>
<td>Year(s)</td>
<td>Summary</td>
<td>Design Type</td>
<td>Control Group Methodology</td>
<td>Notes</td>
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<tr>
<td>Agricultural Decisions After Relaxing Credit And Risk Constraints</td>
<td>Dean Karlan, Robert Osei, Isaac Osei-Akoto, and Christopher Udry, 2012</td>
<td>Ghana</td>
<td>Smallholder farmers</td>
<td>2008-2011</td>
<td>In 2008, 502 farming households were randomly assigned to groups: 117 to cash grant; 135 to insurance grant; 95 to both cash grant and insurance grant; 155 to control group. In 2009, sample was increased by 676 additional households randomly assigned to be sold insurance product at a price of either $1.30 or $5.25, and then randomly drew 867 of the 1,178 in Sample Frame 1 and 2 to be sold the insurance, with the remaining 311 in a control group. Another 228 households assigned to receive insurance marketing at either the estimated fair price of $10.50 or $12.50, or the estimated price in a competitive market ($15.85 or $18.50). A post-harvest survey with 672 of 729 was conducted following the 2009 harvest. In 2011, a second follow-up survey was conducted with 1,252 of 1,406 households.</td>
<td>Experimental Design</td>
<td>Randomized Control Trial, Instrumental Regression Analysis</td>
<td>B, C, D, E</td>
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<tr>
<td>Impact of Access to Credit on Farm Productivity of Fruit and Vegetable Growers in Chile</td>
<td>Alvaro Reyes; Robert Lensink; Arie Kuyvenhoven; and Henk Moll, 2012</td>
<td>Chile</td>
<td>Smallholder farmers</td>
<td>2006, 2008</td>
<td>In the first wave of the survey, data consisted of a random sample of 200 farms located in seven counties in the central region of Chile. During the second wave, they collected information from 200 farmers, 177 of which were in the first wave.</td>
<td>Descriptive Design</td>
<td>Time-Series Regressions</td>
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<tr>
<td>Impact Evaluation of the Farmer Training and Development Activity in Honduras</td>
<td>NORC at the University of Chicago, 2012</td>
<td>Honduras</td>
<td>Smallholder farmers, small and micro-enterprises</td>
<td>2009-2011</td>
<td>The household survey consisted of a total of 7,596 sample units (households) in both survey rounds, of which 4,533 are in Round 0 (Baseline) and 3,063 in Round 1 (endline or follow-up).</td>
<td>Quasi Experimental Design</td>
<td>Propensity Score Matching, Instrumental Regression Analysis</td>
<td>B, C</td>
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<tr>
<td>Microfinance and the Millennium Development Goals in Pakistan: Impact Assessment using Propensity Score Matching</td>
<td>Sununtar Setboonsarng and Ziyodullo Parpiev, 2008</td>
<td>Pakistan</td>
<td>Smallholder farmers</td>
<td>2000-2004 and 2005</td>
<td>In total, 749 poor households who borrowed from Khushhali Bank were matched with 439 non-poor, non-KB borrowers.</td>
<td>Quasi Experimental Design</td>
<td>Propensity Score Matching, Qualitative Methods</td>
<td>A, C</td>
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<td>Study Title</td>
<td>Authors</td>
<td>Country</td>
<td>Household Type</td>
<td>Financial Services Training Period</td>
<td>Study Method</td>
<td>Experimental Design</td>
<td>Treatment Groups</td>
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<td>The Impact of Rural Business Services on the Economic Well-being of Small Farmers in Nicaragua</td>
<td>Michael Carter, Patricia Toledo, and Emilia Tjernström, 2012</td>
<td>Nicaragua</td>
<td>Smallholder farmers</td>
<td>Credit, Financial Services Training</td>
<td>2007-2011</td>
<td>Baseline survey was conducted at the beginning (late 2007) to 1600 households, midline survey in late 2009 (to the same 1600 households) and endline survey was conducted in 2011 at the end of the program.</td>
<td>Experimental Design</td>
<td>A, C, D, E</td>
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<tr>
<td>Evaluation of Water-to-Market Training in Armenia</td>
<td>Kenneth Fortson; Any Rangarajan; Randall Blair; Joanne Lee; and Valentine Gilbert, 2012</td>
<td>Armenia</td>
<td>Smallholder farmers</td>
<td>Credit, Financial Services Training</td>
<td>2008-2011</td>
<td>112 communities (treatment) 77 communities (control group)</td>
<td>Experimental Design</td>
<td>Randomized Control Trial</td>
<td>A, C, E</td>
</tr>
<tr>
<td>An Impact Evaluation Of The MIDA FBO Training</td>
<td>Isser, 2012</td>
<td>Ghana</td>
<td>Smallholder farmers</td>
<td>Credit, Financial Services Training</td>
<td>2008-2011</td>
<td>Farmers were randomly selected from 600 FBOs to be given early training versus late training. In the second stage, 5 farmers were randomly selected from 600 FBOs for inclusion in survey. For both early and late treatment farmers, two rounds of surveys were conducted: 2008 and 2009 and 2009 and 2010 respectively, about 3000 farmers for each group</td>
<td>Experimental Design</td>
<td>Randomized Control Trial</td>
<td>A, B, C</td>
</tr>
<tr>
<td>Impact of microcredit in rural areas of Morocco: Evidence from a Randomized Evaluation</td>
<td>Bruno Crépon; Florencia Devoto; Esther Duflo; and William Pariente, 2011</td>
<td>Morocco</td>
<td>Smallholder farmers</td>
<td>Credit, Savings</td>
<td>2006-2007</td>
<td>81 pairs of matched villages were selected. In each pair of villages, one village was randomly assigned to treatment the other to control and a baseline survey was conducted on 4495 households in both groups. Control villages were given access two years after the treatment villages, at which time an endline survey was conducted on 5551 households (1400 of which were new, i.e. they had not been surveyed at baseline).</td>
<td>Experimental Design</td>
<td>Randomized Control Trial, Propensity Score Matching</td>
<td>A, C, D</td>
</tr>
<tr>
<td>Study Title</td>
<td>Authors</td>
<td>Country</td>
<td>Sample</td>
<td>Study Period</td>
<td>Methods</td>
<td>Findings</td>
<td>Note</td>
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<td>Impact Evaluation Findings after One Year of the Productive and Business Services Activity of the Productive Development Project, El Salvador</td>
<td>Randall Blair; Larissa Campuzano; Lorenzo Moreno; and Seth Morgan, 2012</td>
<td>El Salvador</td>
<td>Smallholder farmers</td>
<td>Financial Services Training</td>
<td>2008-2011</td>
<td>Approximately 20000 participants were surveyed: 518 in diary, 593 in horticulture and 625 in handicrafts. The treatment and control groups were identified ex-ante (using randomization at group level for diary and horticultural chains and at municipal level for handicrafts).</td>
<td>Experimental Design, Randomized Control Trial, Instrumental Regression Analysis</td>
<td>A, C, E</td>
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<tr>
<td>Microinsurance, Trust And Economic Development: Evidence From A Randomized Natural Field Experiment</td>
<td>Hongbin Cai; Yuyu Chen; Hanming Fang; and Li-An Zhou, 2010</td>
<td>China</td>
<td>Smallholder farmers</td>
<td>Insurance</td>
<td>2006-2008</td>
<td>120 villages (low incentive group), 240 villages (high incentive group)</td>
<td>Experimental Design, Randomized Control Trial, Probit, Logit</td>
<td>A</td>
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<tr>
<td>An Experiment on the Impact of Weather Shocks and Insurance on Risky Investment</td>
<td>Ruth Vargas Hill and Angelino Viceisza, 2010</td>
<td>Ethiopia</td>
<td>Smallholder farmers</td>
<td>Insurance</td>
<td>7 days</td>
<td>Although the target number of households was 240 (10 from each iddir), in total 288 people were sampled. Of the 280 listed, 261 participated in the experimental sessions and 241 of those people also completed a household questionnaire, 94 percent of which completed the survey subsequent to participation in the game protocol.</td>
<td>Experimental Design, Randomized Control Trial, Propensity Score Matching</td>
<td>A</td>
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</tbody>
</table>

Note:
A = Productivity
B = Sales
C = Income
D = Consumption
E = Assets
## 6. Summary of Impact Results

<table>
<thead>
<tr>
<th>Title of Study</th>
<th>Authors and Year of Publication</th>
<th>Country of Study</th>
<th>Intervention Group</th>
<th>Type of Intervention</th>
<th>Productivity</th>
<th>Sales</th>
<th>Income</th>
<th>Consumption</th>
<th>Assets</th>
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<tbody>
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<td>Credit's Effect on Productivity in Chinese Agriculture: A Microeconomic Model of Disequilibrium</td>
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<td>China</td>
<td>Small holder farmers</td>
<td>Credit</td>
<td>n.s.</td>
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<tr>
<td>Poverty Status and the Impact of Formal Credit on Technology Use and Wellbeing among Ethiopian Smallholders</td>
<td>Lenis Saweda O. Liverpool and Alex Winter-Nelson, 2010</td>
<td>Ethiopia</td>
<td>Small holder farmers</td>
<td>Credit</td>
<td>** (agro-chemicals), ** (irrigation)</td>
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<td></td>
<td>*</td>
<td>n.s.</td>
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<tr>
<td>Credit Market Constraints And Profitability In Tunisian Agriculture</td>
<td>Jeremy Foltz, 2004</td>
<td>Tunisia</td>
<td>Small holder farmers, small and micro-enterprises</td>
<td>Credit</td>
<td>n.s.</td>
<td>n.s.</td>
<td></td>
<td>** (owned land) ** (equipment)</td>
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<tr>
<td>The Impacts of Credit on Village Economies</td>
<td>Joseph P. Kaboski and Robert M. Townsend, 2009</td>
<td>Thailand</td>
<td>Small holder farmers</td>
<td>Credit</td>
<td>** (other crops), ** (fertilizer/pesticide)</td>
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<td>Does Microfinance Reduce Rural Poverty? Evidence Based On Household Panel Data From Northern Ethiopia</td>
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<td>Small holder farmers</td>
<td>Credit</td>
<td>***</td>
<td>***</td>
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<td>*** (housing improvement)</td>
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<td>Impact of Institutional Credit On Production Efficiency Of Farming Sector: A Case Study Of District Faisalabad</td>
<td>Saima Ayaz and Zakir Hussain, 2011</td>
<td>Pakistan</td>
<td>Smallholder farmers, small and micro-enterprises</td>
<td>Credit</td>
<td>** (fertilizer) * (irrigation) *(cash inputs)</td>
<td></td>
<td>*</td>
<td>(livestock)</td>
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<tr>
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<td>Tanzania</td>
<td>Smallholder farmers</td>
<td>Credit</td>
<td>*** fertilizers, improved seeds, and labor</td>
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<tr>
<td>Topic</td>
<td>Authors</td>
<td>Country</td>
<td>Farmers Type</td>
<td>Services/Impact</td>
<td>Sample Statistics</td>
<td>Notes</td>
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<td>Ghana</td>
<td>Smallholder farmers</td>
<td>Credit, Insurance</td>
<td>n.s., ***</td>
<td>** (proportion of land planted)**</td>
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<td>Chile</td>
<td>Smallholder farmers</td>
<td>Credit, Insurance</td>
<td>n.s., ***</td>
<td>*** (average weekly orchard income)</td>
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<tr>
<td><strong>Insurance, Credit, and Technology Adoption: Field Experimental Evidence from Malawi</strong></td>
<td>Xavier Giné and Dean Yang, 2009</td>
<td>Malawi</td>
<td>Smallholder farmers</td>
<td>Credit, Insurance</td>
<td>n.s. (technology adoption)</td>
<td>***</td>
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<td>Smallholder farmers</td>
<td>Credit, Financial Services Training</td>
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<td>Michael Carter and Patricia Toledo, 2012</td>
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<td>Smallholder farmers</td>
<td>Credit, Financial Services Training</td>
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<tr>
<td><strong>Medium and Long-Term Participation in Microfinance: An Evaluation Using a New Panel Dataset from Bangladesh</strong></td>
<td>Asadul Islam, 2009</td>
<td>Bangladesh</td>
<td>Smallholder farmers</td>
<td>Credit, Financial Services Training</td>
<td>* (self-employment)</td>
<td>**</td>
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<tr>
<td><strong>Impact Evaluation of the Farmer Training and Development Activity in Honduras</strong></td>
<td>NORC at the University of Chicago, 2012</td>
<td>Honduras</td>
<td>Smallholder farmers, small and micro-enterprises</td>
<td>Credit, Financial Services Training</td>
<td>* (basic grains/other crops)</td>
<td>* (from other crops)</td>
<td>n.s.</td>
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</table>
| **Impact of Microcredit in Rural Areas of Morocco: Evidence from a Randomized Evaluation** | Bruno Crépon; Florencia Devoto; Esther Duflo; and William Pariente, 2013 | Morocco   | Smallholder farmers               | Credit, Savings                        | *** (credit)        | ** (credit)                | n.s.  | *** (livestock)
<table>
<thead>
<tr>
<th>Study</th>
<th>Authors</th>
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<th>Treatment Group</th>
<th>Services Provided</th>
<th>Findings</th>
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</thead>
<tbody>
<tr>
<td>Do Rural Banks Matter? Evidence from the Indian Social Banking Experiment</td>
<td>Robin Burgess and Rohini Pande, 2005</td>
<td>India</td>
<td>Small holder farmers, small and micro-enterprises</td>
<td>Credit, Savings</td>
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<td>Small holder farmers</td>
<td>Financial Services Training</td>
<td>n.s.</td>
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<td>An Impact Evaluation Of The MIDA FBO Training</td>
<td>ISSER, 2012</td>
<td>Ghana</td>
<td>Small holder farmers</td>
<td>Financial Services Training</td>
<td>*** (chemical use), *** (increased value in seeds)</td>
</tr>
<tr>
<td>Microinsurance, Trust And Economic Development: Evidence From A Randomized Natural Field Experiment</td>
<td>Hongbin Cai; Yuyu Chen; Hanming Fang; and Li-An Zhou, 2010</td>
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<td>Small holder farmers</td>
<td>Insurance</td>
<td>*** (insured sows)</td>
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<td>Ruth Vargas and Hill Angelino Viceiszsa, 2010</td>
<td>Ethiopia</td>
<td>Small holder farmers</td>
<td>Insurance</td>
<td>*** (fertilizer)</td>
</tr>
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Note:
- n.s. is not statistically significant
- * is statistically significant at the 10% level
- ** is significant at the 5% level
- *** is significant at the 1% level
7. Key Findings & Summary

7.1 Micro-credit

Our synthesis suggests that micro-credit increased farmers’ livelihoods by allowing them to adopt new and improved techniques and technologies, and purchase higher quality and larger quantities of inputs. This led to higher levels of productivity, which often translated into higher agricultural sales and income, and directly affected consumption and growth. According to Ayaz & Hussain (2011), the coefficient of credit was −0.136 at a 1 percent level of significance, meaning it was the highest of all other estimated factors in their analysis contributing to agricultural productivity in their study area of Pakistan. Focusing on Tanzania, Girabi & Mwakaje (2013) find that micro-credit has positive and significant impacts on agricultural productivity. The authors find that credit borrowers produced double the sunflower and maize output on average, compared to non-credit borrowers.

However, according to Feder et al.’s (1991) study in rural China, based on the estimated coefficients, a 1% increase in credit will increase production by only 0.04%. The authors posit that the lower-than-expected effects on production may be due to farmers using credit for income and consumption smoothing instead of production. This is typically the case for farmers trying to mitigate agricultural production cycles, where over a period of several months, very little income is earned, while expenditures on materials, purchased inputs, and consumption need to be made in cash. Thus, the likely agricultural output will be smaller than that expected, even if we assume all funds were used productively.

Berhane & Gardebroek’s (2009) indicate that micro-credit in Ethiopia significantly increased both annual per capita household consumption and the probability of improving
housing (roofs). They do note, however, that while one-time borrowing had no impact on housing improvements, it can lead to significant improvements in per capita consumption. Similarly, Liverpool & Winter-Nelson (2009) find that micro-credit in their study area of Ethiopia had a positive impact on farmer well-being by directly affecting consumption and asset growth, although they also observe positive impacts through the promotion and use of improved technologies. They do caution, however, that these effects are not uniformly distributed and are strongest for those who are not asset poor. The one exception was fertilizer use, where the impact on consumption and asset growth was positive and appeared to cut across all poverty classes.

Among the more important implications of credit constraints is that they impinge on farmers’ profitability by forcing them to have significantly higher shadow prices for land than unconstrained farmers. Foltz (2004) finds that removing credit constraints would improve the profitability of farmers, though not among the poorest farmers, since the credit constrained are not the poorest, least profitable farmers. Kaboski & Townsend (2009) find from their study in Thailand that the increased value of consumption is of the same order of magnitude as the credit injection, or even larger with the baseline estimate of an additional 2.03 units of consumption for every unit of village fund credit injected. Even while dropping outliers, they are still left with a large number (1.24). They also find some evidence that households with loans were less likely (50 percent) to have positive asset growth, and less likely (38 percent) to have asset growth above the household average. The authors find no significant effect of credit on income from agriculturally productive activities from rice and other crops. Business and labor market income, however, were more likely to increase.
7.2 Micro-savings

Our synthesis on micro-savings finds much less evidence of significant impacts on farmers. However, this may be a result of the lack of an appropriate number of relevant studies as opposed to the result(s) of any specific evaluation. We note from evidence in the literature that micro-credit contracts often require borrowers to maintain a percentage of their loan on deposit with the lender as a form of savings to mitigate non-judicious utilization. Such conditions, however, may raise the effective interest rate by reducing the net loan disbursement that the borrower can actually use, while still paying interest on the full loan amount. This often leads farmers to invest in livestock rather than on a formal savings, since livestock are seen as savings in the form of assets, which can also translate later into a source of consumption. Crépon et al. (2011) note in their research in Morocco that treatment households saw increases in sales, income, and savings primarily through investing in the diversification of livestock activities as a risk-management strategy. We think it is also fair to note that Burgess and Pande (2005) observe how increases in savings reduce rural poverty. According to their study in India, a 1 percentage-point increase in the share of savings held by rural banks reduced poverty by 2.22 percentage points.

7.3 Micro-insurance

Risk is a key hindrance to investment, and affects income and asset growth. Our synthesis suggests that micro-insurance helps mitigate risk by supplementing and strengthening the effects of micro-credit, while protecting farmers from the inherent risk of entrepreneurial activities (Cai et al. 2010). Karlan et al.’s 2013 study in Ghana finds that mitigating risk alone, without an infusion of capital, leads to higher investment. However, according to Giné & Yang (2009), acquisition of insurance in Malawi was positively
associated to levels of income and wealth: acquisition was 33% for farmers who were offered the uninsured loan; acquisition was lower, by 13%, among farmers offered insurance with the loan. This suggests that because borrowers are already implicitly insured by the limited liability inherent in their loan contracts, bundling a loan with formal insurance—for which an insurance premium is charged—is effectively an increase in the interest rate on the loan, which is typically unsuitable for smaller farmers. Conversely, Reyes et al. (2012) observe the opposite phenomenon in Chile: the marginal effect of credit and insurance on farm productivity was negligible across constrained and unconstrained farmers. In fact, they observed that lower-income farms try to get full insurance, whereas good farms try to signal their quality by being only partially insured. These contradictions highlight how contextual factors play a role.

7.4 Financial Services Training

While our synthesis finds that financial services training is not significantly impactful (Fortson et al., 2012; ISSER, 2012; NORC, 2012), farmers who better understood the terms of their contracts were more likely to increase fertilizer purchases in the presence of micro-insurance (Hill & Viceisza, 2010). Blair et al. (2012) finds that the treatment group producers in a dairy chain in El Salvador who received financial services training sold larger volumes of milk, as well as more secondary dairy products than control group producers. Specifically, the treatment group saw a difference of over 45% in average productive income and total net income in comparison to the control group for the same period. This highlights the importance of understanding the need for business diversification and foresight. However, in Nicaragua, Carter & Toledo (2012) observed that consumption initially dips with the introduction of the training programs and then shows
modest, long-term increases while income rises, but shows a worrisome pattern of dropping off when the training program came to an end.

7.5 Summary

Beyond observed variations in the above results, an overarching pattern became apparent during the course of formulating our synthesis. This pattern, or theme, if you will, is that of income stratification. Positive impacts from micro-finance interventions are more consistently associated with farmers who are better off from the start; smaller and lower-income farmers do not appear to always benefit significantly from micro-finance programs. Taken together, this implies that while micro-finance certainly can improve farmer’s livelihoods, smaller farmers may lack the complementary resources to benefit significantly because MFIs have yet to adapt to their financial needs.

8. Conclusion and Recommendations

Agriculture remains the largest employment sector in most developing countries, and smallholder farmers in these countries—including the poorest—produce a large portion of the world’s food. Lack of financial services, however, seriously threatens their ability to meet growing demands. Without access, many of these farmers are unable to adopt the most productivity-enhancing practices, and as a result, will continue to engage in low-return, subsistence-oriented production practices that lack diversification and undermine rural livelihood strategies.

Ultimately, food-insecurities have serious local and global implications on human security, and are also likely to persist—even increase dramatically in some regions—given the anticipated increase in the world’s population and middle class, subsequent stress on natural resources, and climate change. MFIs have sought to fill this vacuum by extending
access to borrowers who otherwise would lack the appropriate criteria or collateral to qualify. However, their one-size-fits-all approach has not been able to adapt itself to most small farmers’ cyclical needs.

While there is mounting evidence to show that micro-finance can help achieve the MDGs, our synthesis of the available literature suggests that smaller farmers who lack the complementary resources may not always benefit significantly from these interventions. Traditional financing practices where installments on loan guarantees are scheduled on a monthly basis are not optimal for smaller farmers who are unable to employ income diversification strategies and suitable conventional physical assets. Good banking practices, combined with understanding of the agricultural sector and the client, are core to sound institutional management and operations for financing agriculture. Thus, we recommend that tailoring collateral installments to crop-specific cycles while deferring payments until after the harvest cycle may allow smaller farmers to more effectively smooth income and consumption variability during the planting and cultivation cycles.

Furthermore, we recommend that MFIs find new and innovative ways to lower interest rates on smaller loans. Operating expenses are the largest determinant of interest-rate levels, and according to CGAP (2013), rates have been rising for MFIs focused on low-end borrowers. Therefore, finding ways to streamline products and services to reduce operating expenses is crucial. For more insight, program developers, donors, and MFIs should look into the role of mobile technology as a model for delivering micro-finance products and services. This becomes especially useful when targeting remote rural areas and may be less costly than the traditional model for delivering services (Yousif, 2013). It can also provide useful tools pertinent to farmers, such as agricultural commodity prices,
smart logistics, tracking systems, and platforms for managing supplier and distribution networks.

Program developers, donors, and MFIs should also look into Islamic micro-finance. Central to Islamic finance (which often operates within the boundaries of Sharia Law) is that money itself has no intrinsic value; it is simply a medium of exchange. Each unit is equal in value to another unit of the same denomination, and one is not allowed to make a profit from a monetary exchange (Osborne, 2013). As such, earning interest is not allowed. In order to achieve sustainability, MFIs operating in this context have built extensive human capacity through social intermediation and have designed group-based, profit-sharing lending programs that are effective in reducing transaction costs and lowering exposure to the numerous financial risks in providing credit to the rural poor (Dusuki, 2008).

Taken together, these observations suggest that the last recommendation emerging from this review is the need for more high-quality studies with more rigorous evidence on the impacts of micro-finance on farmers and agricultural production systems. These will ensure effective strategic planning and decision-making for existing and future programs that focus on financial inclusion within the agricultural sector.
iii. References

a. Studies included in the review


_Agricultural Economics, 30_(3), 229-240.


_World Bank Publications, Vol 571._


_American economic journal. Applied economics, 4_(2), 98.


b. Other references used


Barnes, Carolyn; Gaile, Gary; & Kibombo, Richard. (2001). The Impact Of Three Microfinance Programs In Uganda. USAID.


Consultative Group to Assist the Poor (CGAP). (2013). Brief: Trends in International Funding for Financial Inclusion. Available at:


v. Appendices

Appendix 1. Trends in Commitments to Financial Inclusion 2008-13


Appendix 2. Global Commitments to Financial Inclusion 2012-2013

Source: 2012-2013 CGAP Cross-Border Funder Survey (2013)
Appendix 3. Breakeven Points Related to Loan Size and Interest Rate

Source: Charles Waterfield. MFI Solutions, LLC. (2013)
Note: Interest and fee income from loan portfolio as % of average GLP, 866 MFIs reporting to MIX. The thick horizontal bars represent medians; the top and bottom of the solid boxes represent the 75th and 25th percentiles, respectively; and the high and low short bars represent the 95th and 5th percentiles, respectively. So, for example, 95 percent of the MFIs in the sample are collecting an interest yield below about 70 percent. Data here are unweighted: each MFI counts the same regardless of size. EAP = East Asia and Pacific, ECA = Europe and Central Asia, LAC = Latin America and the Caribbean, MENA = Middle East and North Africa.

Source: Rosenberg et al. (2013)
Appendix 5. Contribution of Agriculture to GDP

Source: FAO (2006)

Appendix 6. Contribution of Agricultural Sector to GDP/Financial Inclusion

Source: Morvant-Roux and Servet (2007)
Appendix 7. Evaluation Matrix & Parameter Charts

**Interventions**
- Credit: 33%
- Savings: 14%
- Insurance: 10%
- Financial Services Training: 9%
- Credit + Savings: 5%
- Credit + Insurance: 0%
- Credit + Financial Services Training: 29%

**Outcomes of Interest**
- Productivity: 48%
- Sales: 25%
- Income: 19%
- Consumption: 17%
- Assets: 6%

**Population of Interest**
- Smallholder Farmers: 17%
- Small and Micro Enterprises: 83%

**Inclusion Criteria**
- Experimental: 48%
- Quasi-Experimental: 24%
- Cross-Sectional: 14%
- Time-Series: 14%
Appendix 8. Causal Pathways To Increased Agricultural Productivity

Increased Agricultural Productivity

- Improved Quality of Land and Water Resources
- Increased Use of Improved Agricultural Techniques and Technologies
- Improved Farm Management (Financial, Operational)
- Improved Infrastructure to Support On-Farm Production
- Increased Access to Improved Inputs
- Improved Knowledge Regarding Farm Management

Increased Use of Financial Services

Appendix 9. Causal Pathways To Improved Livelihood

Productivity → Sales → Income → Consumption → Assets

Improvement in Livelihood
Appendix 10.  Interest Rates and Loan Size

Source: Charles Waterfield. MFI Solutions, LLC. (2013)
Appendix 11. Food For Progress Results Frameworks

**Food for Progress Results Framework #1**

- **Increased Agricultural Productivity (FFPr 01)**
  - **Improved Quality of Land and Water Resources (FFPr 1.1)**
  - **Increased Use of Improved Agricultural Techniques and Technologies (FFPr 1.2)**
  - **Improved Farm Management (Operations, Financial) (FFPr 1.3)**

- **Increased Availability of Improved Inputs (FFPr 1.2.1)**
- **Improved Infrastructure to Support On-Farm Production (FFPr 1.2.2)**
- **Increased Use of Financial Services (FFPr 1.2.3)**
- **Increased Knowledge by Farmers of Improved Agricultural Techniques and Technologies (FFPr 1.2.4)**
- **Improved Knowledge Regarding Farm Management (FFPr 1.3.1)**

**Foundational Results**

- **Increased Capacity of Government Institutions (FFPr 1.4.1)**
- **Improved Policy and Regulatory Framework (FFPr 1.4.2)**
- **Increased Access to Improved Market Information (FFPr 1.4.3)**
- **Improved Capacity of Key Groups in the Agriculture Production Sector (FFPr 1.4.4)**
- **Increased Leverage of Private-Sector Resources (FFPr 1.4.5)**

**A Note on Foundational Results**: These results can feed into one or more higher-level results. Causal relationships sometimes exist between foundational results.
Food for Progress
Results Framework #2

Expanded Trade of Agricultural Products
(Domestic, Regional, and International)
(FFPr SO2)

- Increased Value Added to Post-Production Agricultural Products
  (FFPr 2.1)
- Increased Access to Markets to Sell Agricultural Products
  (FFPr 2.2)
- Improved Transaction Efficiency
  (FFPr 2.3)

- Improved Quality of Post-Production Agricultural Products
  (FFPr 2.1.1)
- Increased Efficiency of Post-Production Processes
  (FFPr 2.1.2)
- Improved Marketing of Agricultural Products
  (FFPr 2.1.3, 2.2.1)
- Improved Linkages Between Buyers and Sellers
  (FFPr 2.2.2)
- Improved Market and Trade Infrastructure
  (FFPr 2.2.3, 2.3.1)
- Improved Management of Buyer/Seller Groups Within Trade Sector
  (FFPr 2.3.2)

- Increased Adoption of Established Standards by Industry
  (FFPr 2.1.1.1)
- Increased Use of Improved Post-Production Processing and Handling Practices
  (FFPr 2.1.2.1)
- Improved Post-Harvest Infrastructure
  (FFPr 2.1.2.2)

- Increased Use of Financial Services
  (FFPr 2.2.3.1, 2.3.1.1)

Foundational Results
- Increased Capacity of Government Institutions
  (FFPr 2.4.1)
- Improved Policy and Regulatory Framework
  (FFPr 2.4.2)
- Increased Access to Improved Market Information
  (FFPr 2.4.3)
- Improved Capacity of Key Organizations in the Trade Sector
  (FFPr 2.4.4)
- Increased Leverage of Private-Sector Resources
  (FFPr 2.4.5)

A Note on Foundational Results: These results can feed into one or more higher-level results. Causal relationships sometimes exist between foundational results.
<table>
<thead>
<tr>
<th>Title of Study</th>
<th>Authors and Year of Publication</th>
<th>Country of Study</th>
<th>Intervention Group</th>
<th>Type of Intervention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit's Effect on Productivity in Chinese Agriculture: A Microeconomic Model of Disequilibrium</td>
<td>Gershon Feder; Lawrence J. Lau; Justin Y. Lin; and Xiaopeng Luo, 1991</td>
<td>China</td>
<td>Small holder farmers</td>
<td>Credit</td>
<td>This study found that a 1% increase in credit will increase production by only 0.04%. This suggests that a significant proportion of the short-term credit provided by rural credit cooperatives as production credit may actually be utilized for consumption and investment. Thus, the likely agricultural output will be smaller than that which is expected when all funds are assumed to be used productively.</td>
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<tr>
<td>Poverty Status and the Impact of Formal Credit on Technology Use and Wellbeing among Ethiopian Smallholders</td>
<td>Lenis Saweda O. Liverpool and Alex Winter-Nelson, 2010</td>
<td>Ethiopia</td>
<td>Small holder farmers</td>
<td>Credit</td>
<td>This study found that micro-credit programs had a positive impact on farmer well-being through the use of new and improved techniques and technologies, and by directly affecting consumption and asset growth. However, participation in micro-finance programs increases the likelihood of technology use for the less poor households only. Furthermore, new technologies are more consistently associated with consumption and asset growth among the never asset poor and the transitory asset poor, than among the always asset poor. The one exception is fertilizer use whose impact on consumption and asset growth appears to cut across all poverty classes. Households classified as always asset poor however, do not appear to benefit from micro-finance programs. Moreover, the technology that contributes to asset growth among these households (fertilizer use) does not seem to be affected by micro-credit.</td>
</tr>
<tr>
<td>Credit Market Constraints And Profitability In Tunisian Agriculture</td>
<td>Jeremy Foltz, 2004</td>
<td>Tunisia</td>
<td>Small holder farmers, small and micro-enterprises</td>
<td>Credit</td>
<td>This study found that policies aimed at alleviating credit constraints benefit rural areas. The investigation suggests that the presence of credit market constraints does impinge on farmer’s profitability. Among the more important implications is that constrained farmers have a significantly higher shadow price for land than unconstrained farmers. Alleviating credit constraints may also activate the rural land markets allowing peasants to forgo potentially exploitative contracting situations, and may also have an impact on technology adoption decisions. Those impacts, however, remain small and are mitigated by a number of other factors.</td>
</tr>
<tr>
<td>The Impacts of Credit on Village Economies</td>
<td>Joseph P. Kaboski and Robert M. Townsend, 2009</td>
<td>Thailand</td>
<td>Small holder farmers</td>
<td>Credit</td>
<td>This study found that the Million Baht Village Fund injection of micro-credit in villages had the desired effect of increasing overall credit in the economy. Households responded by borrowing more, consuming more, and investing in agriculture more often than before. The village fund credit had the effect of decreasing future assets, increasing future incomes, and making business and market labor more important sources of income.</td>
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<tr>
<td>Study Title</td>
<td>Authors</td>
<td>Country</td>
<td>Sector</td>
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<tr>
<td>Does Microfinance Reduce Rural Poverty? Evidence Based On Household Panel Data From Northern Ethiopia</td>
<td>Guush Berhane And Cornelis Gardebroek, 2009</td>
<td>Ethiopia</td>
<td>Small holder farmers</td>
<td>Credit</td>
<td>This study indicates that micro-credit significantly raised both annual per capita household consumption and the probability of improving housing (roofs), which is an important welfare indicator in the study area. The random trend model with flexible participation indicators shows that per capita household consumption and the probability of improving the house increased with the frequency of participation, although these increases were not statistically significant in the case of household consumption. Onetime borrowing has no impact on housing improvements, but it does lead to significant improvements in per capita consumption, which is plausible at such early stages of livelihood changes for households in marginal areas.</td>
</tr>
<tr>
<td>Impact of Institutional Credit On Production Efficiency Of Farming Sector: A Case Study Of District Faisalabad</td>
<td>Saima Ayaz and Zakir Hussain, 2011</td>
<td>Pakistan</td>
<td>Smallholder farmers, small and micro-enterprises</td>
<td>Credit</td>
<td>This study indicates that credit took the highest coefficient value in the impact analysis, indicating that it was the most influencing factor for farming efficiency (productivity). This means that the provisions of more adequate credit facilities ensure timely utilization of agricultural inputs and new technologies adoption, which aid in achieving technical efficiency.</td>
</tr>
<tr>
<td>Impact of Microfinance on Smallholder Farm Productivity in Tanzania: The Case of Iramba District</td>
<td>Frank Girabi and Agnes Godfrey Mwakaje, 2013</td>
<td>Tanzania</td>
<td>Smallholder farmers</td>
<td>Credit</td>
<td>This study concludes that micro-credit has positive and significant impacts on agricultural productivity for the variables of fertilizers, improved seeds and hired labor. An increase of fertilizer by one unit will increase sunflower productivity by 0.274 units, while 1 unit increase in improved seeds application will result in 0.223 unit increase in sunflower productivity. On the other hand, 1 unit increase in hired labor will result in 0.316 units increase in sunflower productivity.</td>
</tr>
<tr>
<td>Agricultural Decisions After Relaxing Credit And Risk Constraints</td>
<td>Dean Karlan, Robert Osei, Isaac Osei-Akoto, and Christopher Udry, 2012</td>
<td>Ghana</td>
<td>Smallholder farmers</td>
<td>Credit, Insurance</td>
<td>This study found that risk is a key hindrance to investment, and thus improved income and growth. Mitigating risk alone, without an infusion of capital, leads to higher investment. Thus, the lesson should not be to simply bundle rainfall insurance with loans but rather to use the delivery infrastructure and perhaps the trust that micro-finance institutions or banks may have in the community, in order to market and distribute rainfall insurance.</td>
</tr>
<tr>
<td>Impact of Access to Credit on Farm Productivity of Fruit and Vegetable Growers in Chile</td>
<td>Alvaro Reyes; Robert Lensink; Arie Kuyvenhoven; and Henk Moll, 2012</td>
<td>Chile</td>
<td>Small holder farmers</td>
<td>Credit, Insurance</td>
<td>This study found that despite some evidence of credit constraints due to asymmetric information and adverse selection prevalent in rural areas in Chile, the marginal effect of credit and insurance on farm productivity is nil across constrained and unconstrained farmers. Furthermore, it was observed that lower-income farms try to get full insurance, whereas good farms try to signal their quality by being only partially insured. This implies that farms that are insured are poorer-quality farms that will have a higher probability of being quantity rationed.</td>
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<tr>
<td>Study Title</td>
<td>Authors/Institutions</td>
<td>Location/Country</td>
<td>Target Group</td>
<td>Services Provided</td>
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<tr>
<td>Insurance, credit, and technology adoption: Field experimental evidence from Malawi</td>
<td>Xavier Giné and Dean Yang, 2009</td>
<td>Malawi</td>
<td>Small holder farmers</td>
<td>Credit, Insurance</td>
<td>This study found differences in farmers that were randomized into two groups that differed in whether their loans were insured against poor rainfall. Take-up was 33.0% for farmers who were offered the uninsured loan. Take-up was lower, by 13 percentage points, among farmers offered insurance with the loan. A potential explanation is that farmers already are implicitly insured by the limited liability inherent in the loan contract, so that bundling a loan with formal insurance (for which an insurance premium is charged) is effectively an increase in the interest rate on the loan.</td>
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<tr>
<td>Microfinance and the Millennium Development Goals in Pakistan: Impact Assessment using Propensity Score Matching</td>
<td>Sununtar Setboonsarn and Ziyodullo Parpiev, 2008</td>
<td>Pakistan</td>
<td>Small holder farmers</td>
<td>Credit, Financial Services Training</td>
<td>This review of micro-finance’s contributions to the MDGs concludes that micro-finance institutions have been effective in contributing, directly and indirectly, to all the eight MDGs. Micro-finance contributes to improving income and reducing hunger (MDG 1), providing children school education and training (MDG 2), and paying for health services (MDG 4 – 6). The main beneficiaries of micro-finance services are women, so MFIs contribute to women’s empowerment and gender equality (MDG 3). As for the environment (MDG 7), MFIs are increasingly combining environmental programs with their financial services, although the contribution may be indirect. For MDG 8, since Target 12 calls for the development of open, rule-based, non-discriminatory financial systems, the expansion of micro-finance programs themselves is the achievement of MDG 8. The extent of micro-finance impacts on each MDG, however, is context specific.</td>
</tr>
<tr>
<td>The Impact of Rural Business Services on the Economic Well-being of Small Farmers in Nicaragua</td>
<td>Michael Carter and Patricia Toledo, 2012</td>
<td>Nicaragua</td>
<td>Small holder farmers</td>
<td>Credit, Financial Services Training</td>
<td>This study indicates that consumption initially dips with the introduction of micro-finance programs and then shows modest, long-term increases. Income in the activities targeted by these programs rises, but shows a worrisome pattern of dropping off when direct assistance came to an end. The program does appear to have provoked significant increases in both attached and mobile farm capital.</td>
</tr>
<tr>
<td>Medium and Long-Term Participation in Microfinance: An Evaluation Using a New Panel Dataset from Bangladesh</td>
<td>Asadul Islam, 2009</td>
<td>Bangladesh</td>
<td>Small holder farmers</td>
<td>Credit, Financial Services Training</td>
<td>This study concludes that the graduation from poverty using micro-credit requires longer-term participation to achieve productive efficiency or to generate higher returns from self-employment activities.</td>
</tr>
<tr>
<td>Impact Evaluation of the Farmer Training and Development Activity in Honduras</td>
<td>NORC at the University of Chicago, 2012</td>
<td>Honduras</td>
<td>Small holder farmers, small and micro-enterprises</td>
<td>Credit, Financial Services Training</td>
<td>This study suggests their program does not appear to have had a significant impact on household expenditures or net household income. The estimated effects on these two indicators are positive, but not statistically significant.</td>
</tr>
<tr>
<td>Impact of microcredit in rural areas of Morocco: Evidence from a Randomized Evaluation</td>
<td>Bruno Crépon; Florencia Devoto; Esther Dullo; and William Pariente, 2013</td>
<td>Morocco</td>
<td>Small holder farmers</td>
<td>Credit, Savings</td>
<td>This study suggests that the main effect of micro-credit is related to the development of already existing activities. This is especially true for agricultural activities for which one can see a large increase in sales, as well as an increase in expenditure and employment associated with a substantial increase in profits. Micro-credit also had an effect on livestock activities. They see that sales significantly increase, as well as savings,</td>
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62
which is the livestock’s value and self-consumption. The components of income of households in treatment villages were also affected. Although net income does not increase, they see an increase in agricultural income and a reduction in wages for external work and sales of assets. Households seem to focus on their own agricultural activities and save their income under the form of livestock. However they do not see any impact on household consumption associated with these changes.

<table>
<thead>
<tr>
<th>Study Title</th>
<th>Authors</th>
<th>Country</th>
<th>Target Group</th>
<th>Financial Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do Rural Banks Matter? Evidence from the Indian Social Banking Experiment</td>
<td>Robin Burgess and Rohini Pande, 2005</td>
<td>India</td>
<td>Small holder farmers, small and micro-enterprises</td>
<td>Credit, Savings</td>
</tr>
<tr>
<td>Impact Evaluation Findings After One Year of the Productive and Business Services Activity of the Productive Development Project, El Salvador</td>
<td>Randall Blair; Larissa Campuzano; Lorenzo Moreno; and Seth Morgan, 2012</td>
<td>El Salvador</td>
<td>Small holder Farmers</td>
<td>Financial Services Training</td>
</tr>
<tr>
<td>Evaluation of Water-to-Market Training in Armenia</td>
<td>Kenneth Fortson; Any Rangarajan; Randall Blair; Joanne Lee; and Valentine Gilbert, 2012</td>
<td>Armenia</td>
<td>Small holder farmers</td>
<td>Financial Services Training</td>
</tr>
<tr>
<td>An Impact Evaluation Of The MIDA FBO Training</td>
<td>ISSER, 2012</td>
<td>Ghana</td>
<td>Small holder farmers</td>
<td>Financial Services Training</td>
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</table>

This study suggest that the Central Bank’s licensing policy enabled the development of an extensive rural branch network, and that this, in turn, allowed rural households to accumulate more capital and to obtain loans for longer-term productive investments.

This study finds that the treatment group producers in the dairy chain sold a larger volume of milk, as well as more secondary dairy products than control group producers. The positive impact of PBS assistance on producers’ net income is likely related to both of these products.

This study found little evidence that training increased adoption of key agricultural practices, with only a handful of exceptions. Financial limitations were the most common reason given for not implementing OFWM and HVA practices. Farmers were unable or unwilling to invest in cultivating higher-value crops. They did not find evidence that training substantially improved long-term measures of farmers’ well being such as income, poverty, or consumption. However, they note that impacts were measured after a difficult agricultural year, with ambiguous implications for impacts in a typical year.

This study found that the intervention did not have any impact on the overall crop yields and incomes. They further examined the impact of the intervention on the two main components of crop incomes, namely costs and revenue, and found no impact at the aggregate level for either indicators. However, they found evidence of the training impacting positively the amount of loans that households received, although this seems to be driven by the MiDA loans. Estimates using only loans from non-MiDA sources show no impact. They also find that MiDA training impacted positively on the value of chemicals used by the farmers. However this translates to a value that is significantly lower than what the farmers were given as part of the starter pack. It suggests that the impact found here is purely due to the starter pack. To conclude, they note that although overall, and for most outcome indicators, they do not find any significant effect, there are signs albeit limited, of differential impacts with respect to the zones.
<table>
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<tr>
<th>Title</th>
<th>Authors</th>
<th>Country</th>
<th>Sector</th>
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<th>Summary</th>
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<tbody>
<tr>
<td>Microinsurance, Trust And Economic Development: Evidence From A Randomized Natural Field Experiment</td>
<td>Hongbin Cai; Yuyu Chen; Hanming Fang; and Li-An Zhou, 2010</td>
<td>China</td>
<td>Small holder farmers</td>
<td>Insurance</td>
<td>This study indicates that having access to formal insurance significantly increases farmers’ tendency to raise sows. Their findings suggest that micro-insurance may be as important as micro-insurance in poverty alleviation, and micro-insurance can supplement and strengthen the effects of micro-finance by protecting the farmers from the inherent risk of entrepreneurial activities. They also show that trust, or lack thereof, for government-sponsored insurance products acts a significant barrier for farmers' willingness to participate in the insurance program.</td>
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<td>An Experiment on the Impact of Weather Shocks and Insurance on Risky Investment</td>
<td>Ruth Vargas and Hill Angelino Viceisza, 2010</td>
<td>Ethiopia</td>
<td>Small holder farmers</td>
<td>Insurance</td>
<td>This study found some evidence that insurance has a positive impact on fertilizer purchases. It is perhaps not surprising that stronger results were not present on average, in a short game protocol. Disaggregation of the impact of insurance suggests that farmers who were more risk averse or who understood the contract better were more likely to increase fertilizer purchases in the presence of insurance. Purchases were also found to depend on wealth and, in accordance with the law of small numbers, the past history of weather realizations, suggesting changes in perceptions of the costs and benefits of fertilizer purchases were also driving changes in behavior.</td>
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