

What is 'AIL-ing' the Agricultural Microfinance Model?



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Abbreviations:

CGAP	Consultative Group to Assist the Poor
FAO	Food and Agriculture Organization
GBL	Group based lending
GRAIL	Government based agent
IFAD	International Fund for Agricultural Development
IPA	Innovations for Poverty Action
J-PAL	The Abdul Latif Jameel Poverty Action Lab
MAU	Microfinance as usual
MFI	Microfinance institutions
MFO	Microfinance officers
NABARD	National Bank for Agriculture and Rural Development
NHRDF	National Horticulture Research and Development Foundation
RF	Rural finance
SHG	Self-Help Groups
TRAIL	Trader based agent

Executive Summary:

The boom of microfinance products over the last two decades has provided critical financial services to the poor with the goal of alleviating poverty by filling the gap left by large-scale poverty reduction programs. These programs have proven that the poor are bankable and can repay loans at a significantly high rate, which has led to an increase of donor funds as well as an increase in commercial actors entering the field. As of 2009, there were over 90 billion microfinance borrowers, and the total loan portfolio was about \$60 billion USD.¹

Even with an increase in microfinance institutions (MFIs) lending to the poor, there remains a marked focus on lending in urban areas. Although some MFIs may branch out to rural areas, they tend to focus on providing services to clients that are viewed as less risky and fit within the confines of the microfinance as usual model.² As a result, loans for agricultural purposes are often a negligible portion of an MFI's loan portfolio.

Academic literature on agricultural microfinance is unanimous on the need for innovation in the design for credit products.³ As the literature suggests, the microfinance as usual [MAU] model does not currently meet the needs of rural, small farmers. Therefore, it is evident that a new model of finance is needed to bridge this gap. This paper explores an innovative, new model of microfinance that is meant to help fill this void.

The Agent Intermediated Lending model [AIL] is a digression from the general microfinance models that enforce joint liability and group lending contracts.⁴ It is predominantly an individual lending model that capitalizes the social networks of rural landscapes and seeks to make agricultural microfinance sustainable. The structure is designed to operate in the traditional agricultural marketing networks of traders, wholesalers, and other intermediaries, termed as middlemen. In this paper, we scrutinize a randomized control experiment that placed this product in the traditional potato-marketing network of West Bengal in India.

We strive to justify the motivation, placement, design, and evaluate the impact of this innovation. The first part of this analysis consists of an academic literature review meant to place this model within the current microfinance context. The second section introduces the AIL model of lending, and describes the different features of this unique product. Additionally, this section sets out to compare the new model with the MAU model. The next section offers an econometric analysis of the impact of the AIL model. Specifically, we look at impacts on production, marketing, and recommendation patterns. We then move to a qualitative analysis based on an anthropological survey given to the different actors involved with this intervention. We end with recommendations for future research.

¹ <http://www.mixmarket.org/>

² Geetha Nagarajan and Richard Meyer. "Rural Finance: Recent Advances and Emerging Lessons, Debates, and Opportunities," (Working Paper AEDE-WP-0041-05, The Ohio State University, 2005): 3-4. The microfinance as usual model (MAU) is typically defined by small loans given to the poor to start micro-businesses. The lending methodology includes: weekly repayment and group monitoring, which result in high repayment rates.

³ See Gine, Goldberg & Yang (2010), Ashraf, Gine & Karlan (2008), Karlan & Zinman (2009), Aghion & Morduch (2000) etc

⁴ See Stiglitz (1990) & Varian (1990)

1. Why Should Microfinance Organizations Shift Their Focus to Agriculture?

Agriculture remains a critical aspect of both the lives of the poor and the economies of developing countries. According to the World Bank, 1.2 billion live in extreme poverty (defined as less than \$1.25 per day in purchasing power parity), and three quarters of which live in rural areas. As a result, many of the individuals that fall into the extreme poor category rely on agriculture for their livelihood. In Asia and Africa, for example, over 50 percent of the active population is engaged in agricultural activities, which consists mainly of subsistence farming.

Far too often, those taking part in farming activities in developing countries are operating at a sub-optimal level. Subsistence farming is the norm. As the Global Monitoring Report (2005) states, the extreme poor spend approximately half of their income to obtain or produce staple foods.⁵ Many individuals simply do not have the resources to invest in expensive inputs such as high quality seeds and fertilizers, nor do they have the funds to store their products after harvest in order to procure higher prices. When farmers need crucial resources to fund their agricultural activities, far too often they must turn to informal sources such as moneylenders, traders, or family. For the extreme poor, even informal sources are unattainable. As a result, poor farmers in developing countries are forced to accept low yields and low prices due to the lack of formal credit. Additionally, small changes in the market, an unexpected weather pattern or natural disaster, or a lack of a buyer can severely impact small farmers. With few options to mitigate these risks, the poor who rely on agriculture for their livelihood find themselves working within a harsh cycle of poverty.⁶

For these reasons, agricultural finance has been the centerpiece of many rural development programs in developing countries over the past few decades, as donors recognized the important link between poverty and agriculture. As Geetha Nagarajan and Richard Meyer explain in *Rural Finance: Recent Advances and Emerging Lessons, Debates, and Opportunities*, billions of dollars over the last few decades have been directed towards these programs.

⁵ Robert Christen and Douglass Pearce, "Managing Risks and Designing Products for Agricultural Microfinance: Features of an Emerging Model," (CGAP Occasional Paper No. 11, 2005). These numbers are based off of the World Bank's estimates given in the "Global Monitoring Report" 2005.

⁶ Consultative Group to Assist the Poor (CGAP), "Emerging Lessons in Agricultural Microfinance: Selected Case Studies," *IFAD* (2006): 6.

Nagarajan and Meyer label this period between the 1960s and 1970s as the “old rural finance paradigm.” In their view, this paradigm focused on governments and donor agencies intervening in the rural markets by promoting lending requirements and quotas on banks, offering loans at lower interest rates to farmers, advocating credit guarantees, and focusing on targeted lending by development focused finance institutions.⁷ The obvious goal of these programs was to address the issue of low productivity by offering the poor cheap inputs and subsidized credit in order to overcome the market asymmetries that plagued rural agricultural markets. Perhaps the best-documented case has been the Green Revolution in India, which provided subsidized seeds and fertilizer to farmers in order to increase productivity.⁸

Although the premise of the old paradigm of rural finance was to promote agricultural development through targeted interventions meant to increase rural lending while reducing costs and risks to the lenders, the final outcome of this approach failed reach this objective. Subsidized interest rates did not allow rural finance institutions (RFIs) to cover costs. Furthermore, subsidized credit far too often targeted the wrong products, which lead to an increase in production inefficiencies. As a result, the number of nonperforming loans increased dramatically.⁹ Even with some visible short-term successes, as in the example of the Green Revolution, the long-term impact of the old RF paradigm has been marred with poor repayment rates for loans and been propped up by unsustainable subsidies.

The excitement of financing agricultural projects has decreased dramatically since the 1970s due to the obvious failures of the old rural finance paradigm. Not surprisingly, repeated failures led to donors becoming increasingly skeptical of the positive impacts of these programs. Instead of learning from these lessons and finding a better means of financing agriculture, the donor community simply decided to decrease its lending for agricultural programs across the board. In the 1970s, agricultural lending accounted for over 30 percent of all World Bank lending; however, by 2000, this number dropped below 10 percent. The amount of Official

⁷ Nagarajan and Meyer: 3-4.

⁸ Anand, Geeta, “Green Revolution in India Wilts as Subsidies Backfire,” *Wall Street Journal On-line*, February 22, 2010, accessed on December 8, 2010, <http://online.wsj.com/article/SB10001424052748703615904575052921612723844.html>

⁹Ibid.

Development Assistance (ODA) provided by the OECD countries for agricultural projects has dropped considerably as well. As a result, the real net aid to agriculture in the 1990s dropped to a mere 35 percent of its level in the 1980s.¹⁰

With the decrease in aid from donor countries and aid organizations like the World Bank, the rural poor are more vulnerable than ever. With few formal options for financing, the rural poor must turn to informal sectors such as moneylenders, traders, or family members to finance agricultural production. Even though the picture appears bleak at first glance, a closer analysis of donor financing suggests that a new rural finance paradigm is emerging. As Robert Christen and Douglass Pearce suggest, the trend in development financing has largely been a shift from providing funds to large-scale, government run agricultural projects to funding microfinance organizations.¹¹ This new paradigm utilizes the successes of the microfinance industry over the past three decades to create a market-oriented, financial systems approach to promote agricultural productivity and poverty reduction in rural areas.

To date, the successes of MFIs tend to revolve around urban and semi-urban areas, and have very rarely extended to the rural sectors of developing countries. This lack of focus on rural areas is not surprising given the risks associated with both rural and agricultural finance. In terms of rural finance, delivering small loans to areas with scattered populations and poor infrastructure is time consuming, costly, and often not profitable.¹² If an MFI adds the risks associated with agricultural financing, which is a subset of rural finance that is focused on financing agricultural activities, then the costs increasingly appear to outweigh the benefits.¹³

Calvin Miller sums up the risks associated with agricultural lending in a paper presented at the FAO Rural Finance Workshop in 2004. He breaks the risks up into four key constraints: vulnerability, operations, capacity, and political and regulatory risks (see Appendix 1).¹⁴ More

¹⁰ Christen and Pearce: 1-2.

¹¹ Ibid.

¹² Rural finance is often defined as the provision of financial services to rural individuals, households, and enterprises.

¹³ Meagan Andrews, "Microcredit and Agriculture: How to Make it Work," (*MEDA*, July 2006): 2-3, 8-9.

¹⁴ Calvin Miller, "Twelve Key Challenges in Rural Finance," (*FAO* 2004).

specifically, beyond the inefficiencies of delivering microfinance to rural areas, the challenges of financing agriculture include:¹⁵

- Maintaining liquidity in areas that are dependent on agriculture due to the seasonality of demand.
- Protecting against covariant risks including natural disasters, universal decline in market prices, low yields, and unexpected weather patterns.
- Avoiding increase risk of nonperforming loans in areas that rely on one or two crops due to idiosyncratic and covariant risks mentioned above, and addressing the culture of poor lending precedents to improve repayment among borrowers.
- Adapting existing MF models to be more flexible to meet the specialized needs of agricultural financing.
- Reaching small-scale farmers who may lack the collateral required for securing a loan in agriculture.

The combinations of these challenges have limited the ability of MFIs to reach the rural poor. Yet despite these seemingly insurmountable challenges there are many emerging examples of MFIs that have taken on the risks and by adapting their lending models have created successful agricultural lending programs. A 2006 study by the Consultative Group to Assist the Poor (hereafter referred to as CGAP) and the International Fund for Agricultural Development (IFAD) analyzes the best practices of several agricultural financing programs in developing countries including Confianza in Peru, Bai Tushum Financial Foundation in Kyrgyzstan, Caja Los Andes in Bolivia, Equity Bank in Kenya, and Cooperative League of the USA in Mozambique. Nagarajan and Meyer as well as Christen and Pearce also survey existing MFIs to determine a framework for lending in rural areas. In sum, the authors posit that the principal lessons in designing an agricultural finance product are:¹⁶

- The demand for financial services exists in rural areas, but current microfinance products must be adapted to meet the needs of its rural clients.
- Flexibility is key. Products for agricultural lending require flexible disbursement and repayment schedules to account for the cyclical cash flows and large, infrequent investments in items like fertilizers and seeds.

¹⁵ CGAP, “Emerging Lessons in Agricultural Microfinance”: 8.

¹⁶ CGAP, “Emerging Lessons”: 8-9; Nagarajan and Meyer: 19; Christen and Pearce: 4-5.

- Diversification of an organization's portfolio by combining agricultural loans with other products, such as urban loans, housing loans, savings, insurance, etc, creates cross-subsidization and is an important factor in reducing risk while maintaining or improving profits.
- Partnering with existing institutions may reduce costs and expand outreach. This includes creating alliances with corporations to facilitate contract farming or bringing in traders to facilitate agricultural loans within an existing structure in a local area.
- Utilizing technology can reduce the high transaction costs.

While these various reports offer examples of successful MFIs that provide agricultural credit farmers in rural areas, these examples are the exception rather than the norm. Furthermore, the methodology of these programs makes it difficult to extend credit to small-scale farmers, which means that those who often need loans the most are left out of these schemes. PRODEM in Bolivia, for example, requires collateral valued at 1.5 times the loan amount for individual agricultural loans. It also limits the maximum portfolio for agricultural lending to 30 percent.¹⁷ Confianza implemented strict lending guidelines, which requires a household to have multiple income sources in order to be eligible for an agricultural loan. This meant that households dependent on one crop were systematically excluded. Confianza, like PRODEM, now requires collateral as a means of securing a loan. Furthermore, they limited outreach to clients who fall within an hour and a half of a branch office in an effort to cut costs.¹⁸ In other words, in an effort to maintain increase profits and maintain sustainability, these organizations effectively reduced their poverty outreach.

There is one stark example of an MFI experimenting with new methodology to target the rural poor. BASIX in India recognized that gap in agricultural lending left by its peers such as the Grameen Bank and the Bank Rakyat Indonesia (BRI). The founders viewed the model promoted by the Bank for Agriculture and Agricultural Cooperatives (BRAAC) a more suitable model for an organization aiming to target the rural poor in India. Although BASIX originally followed the GBL method, they created an impressive portfolio with over 50 percent of all loans going to crops, livestock, and other long-term agricultural activities like irrigation and bore

¹⁷ Nagarajan and Meyer: 19

¹⁸ CGAP, "Emerging Lessons": 16-17.

wells. Even with a majority of its loans tied up in agriculture, BASIX had a repayment rate of 95 percent.¹⁹

From 1996 to 1999, BASIX decided to try an agent based lending model. They decided to test this new product by using *ahratiyas* or commission agents in Karnataka. BASIX would give loans to the *ahratiyas* at 21 percent interest, and the agents would then on-lend the money at no more than 24 percent annually. The agents could also receive a 2 percent commission from farmers who were supposed to sell their produce to the *ahratiya* that originally provided the loan.²⁰

BASIX faced many challenges with this new program. Many of the *ahratiyas* began colluding with one another at the expense of the client. Many charged much higher interest than originally mandated by the MFI. Furthermore, the agents began defaulting on the BASIX loans. Due to a difficult legal atmosphere, it was nearly impossible for BASIX to take the agents to court to recover the funds.²¹ Eventually, BASIX had to discontinue the program.

There are many lessons to take away from the BASIX experience. First, it was difficult to monitor who received the loans. The company could not decipher whether or not the loans went to small farmers who needed credit, or larger farmers who could afford to pay higher interest charged by the *ahratiyas*. Second, BASIX found that the monitoring costs were extremely high. Finally, BASIX did not prepare for covariant risks, and suffered high default rates as a result of unforeseen weather disturbances.²²

It is difficult to fault these organizations for their methodology. Each is doing its best to adapt the microfinance as usual (MAU) product in an effort to tailor it to the needs of the rural poor in their respective countries. With only general guidelines and best practices based solely on case studies from organizations like CGAP and IFAD, MFIs are choosing to first adopt strategies that protect the institutions from risk even if that means only gradually bringing in more rural clients. This is a logical path to take for any MFI. Therefore, as Nagarajan and

¹⁹ Vijay Mahajan and NV Ramana, "Agricultural Finance by Microfinance Institutions: Problems and the Way Forward," (UNCTAD Geneva, 2004).

²⁰ Ibid, 5.

²¹ Ibid.

²² Ibid.

Meyer argue, this focus on brief, descriptive case study analysis creates an obvious gap in the collective knowledge of rural finance.

Therefore, these briefs offer a general analysis of rural finance, and as a result, they do not tackle more difficult topics such as:

- Can microfinance be effective in rural areas where poverty is more severe?
- Is collateral absolutely needed to guarantee agricultural loans?
- Can an MFI lend to a household that relies primarily on one crop?
- Does an MFI have to follow the MAU model, or can it deviate more drastically from this model?
- What role can existing institutions and informal players in the market play in advancing MF in rural areas?

The intervention that is the subject of this study was conducted in a rigorous fashion in order to apply an empirical methodology to test some of these difficult questions. The next section will go into more depth about the product design to further elucidate on the many ways that this new product moves past the MAU model to create a product that fits the needs of those who want to finance agricultural in rural areas. To say that this product is novel might be a bit misleading. Many of its main components appear to have been borrowed from other agricultural loan products around the world including individual loans, longer repayment cycles, and insurance. In reality, it appears as if the creators of the program that is the subject of this study took the best practices of other organizations as a starting point for the original research design.

However, to say that this program is not unique would also be disingenuous. First, the fact that the program works within an existing hierarchical framework in the local community (i.e. using traders and government officials as agents) offers an inimitable and perhaps ingenious manner in which to lower costs, increase trust in the new program, and offer a screen tool in the absence of a credit rating agency. Second, the fact that this program does not require collateral is also a deviation from the norm. As discussed above, most agricultural financing programs require some type of collateral. Therefore, this program allows the focus to shift from wealthier farmers to poor small and sometimes even landless farmers, which is an area that not many MFIs are willing to service. In other words, this program has the potential to meet the needs of the poor

who are far too often left out in the microfinance world. Finally, this program is one of only a few randomized experiments dealing with agricultural finance. As previously mentioned, almost all of the examples of MFIs promoting agricultural financial products are merely case studies. As a rigorous test, this program has the potential to prove to MFIs that this type of financing helps the poor while remaining profitable.

Therefore, the purpose of this paper is to fill this knowledge gap that exists in the field of rural finance in order to move the debate on agricultural financial products forward. The paper aims to show that loans to farmers who rely on one crop can be productive and cost-effective. One might label this focus on poorer, small farmers yet another shift in the rural finance paradigm.

2. Innovation - Description and Context:

The problems in agricultural lending were highlighted in the previous section. These have contaminated the efficiency of credit delivery and proved to be barriers to the credit access expansions in these areas. Academic literature on agricultural microfinance is unanimous on the need for innovation in the design for credit products.²³ This section strives to justify the motivation, placement and design of the innovation.

2.1 Why India?

Implementing a research program designed to target rural agricultural by using a microcredit intervention in India makes sense for a few reasons. First, agriculture continues to play a vital role in the Indian economy. In 2003, agricultural GDP account for 22 percent of the national GDP, or \$110 billion USD. According to a 2005 report by the International Fund for Agricultural Development (IFAD), approximately 238 million people depend on agricultural for their livelihood, which includes 60 percent of the rural labor force.

Furthermore, marginal and small farmers owning less than 2 ha of land accounted for 74 percent all farms in 1993. Even though marginal farmers make up most of the farms, they hold only a small percentage of total farm area. In fact, medium and large farmers dominate a

²³ See Gine, Goldberg & Yang (2010), Ashraf, Gine & Karlan (2008), Karlan & Zinman (2009), Aghion & Morduch (2000) etc

majority of the market. Not surprisingly, poverty in India is increasingly a rural phenomenon. Although the overall rates of poverty have dropped from 64 percent of the population in 1968 to 39 percent of the population, a majority of those living in rural areas are poor. In fact, 75 percent of all poor live in rural areas.²⁴ These numbers suggest that programs targeted to rural areas could have a large overall impact on addressing poverty in India.

Second, India has a long history of supporting agriculture through various agricultural policies. From the 1950s onward, the government focused on agrarian reform by creating land reforms, pushing farmers to technology by offering large subsidies, and increasing the minimum price support for cereals. Even though there has been a push to make agriculture more efficient and profitable, the results of these various reforms are mixed at best. As the IFAD report argues, “The cumulative impact of these policies in terms of poverty alleviation and employment generation has been an imbalance in landholding patterns, complicated land tenure relations in some states and a high incidence of poverty that have remained inhibiting factors in raising agricultural productivity and employment.”²⁵ Even with uncertain results, the government remains supportive and continues to refine and implement new agricultural policies. As a result, these past policies give researchers a natural platform to utilize in an attempt to help refine the agricultural support programs, including testing new microfinance programs.

Finally, India has been the hot bed for microfinance for quite a few decades. Following the successes of the Grameen Bank in neighboring Bangladesh, perhaps no other country has been move actively involved in promoting microfinance. Regionally, India is dominating the market. According to Mix Market, there are 321 MFIs in South Asia with over 50 million borrowers and a total gross loan portfolio of \$7.6 billion USD.²⁶ Currently, India has 147 MFIs self-reporting their numbers to Mix Market representing 26.6 million active borrowers and over

²⁴ International Fund for Agricultural Development, “Republic of India – Country Strategic Opportunities Paper,” December 2005; Vijay Mahajan and NV Ramana: 1.

²⁵ IFAD, “Republic of India”: 4.

²⁶ South Asia consists of Afghanistan, Bangladesh, India, Nepal, Pakistan, and Sri Lanka in terms of Mix Market’s analysis.

\$4.6 billion USD in gross loan portfolio. Bangladesh ranks second to India with only 28 MFIs reporting that represent 20.5 million borrowers and \$2.3 billion USD gross loan portfolio.²⁷

It is important to note that the MFIs that tend to report to Mix Market are usually larger organizations that are able to employ auditors to review and certify the information provided to the company. For example, the top 15 MFIs reporting to Mix Market represent 21.5 million borrowers and \$3.9 billion USD, or 81 percent of all borrowers and 85 percent of the total profits of all reporting MFIs in India. This suggests that these 15 institutions corner over 80 percent of the market in India (see Appendix 2). Interestingly, seven Indian MFIs are among the 50 Top Microfinance Institutions as ranked by Forbes in a 2007 report. Those ranked in this survey include: Bandhan (2nd), the Microcredit Foundation of India (13th), Saadhana Microfin Society (15th), Grameen Hoota (19th), Sharada's Women's Association for Weaker Section (23rd), Asmitha Microfin Ltd. (29th), and SKS (44th).²⁸ In short, Mix Market may only give a small snap shot into the microfinance sector in India, but this small snap shot is a striking view into the top MFIs in the region. In the end, however, this simply does not offer a full assessment of the industry as a whole.

To supplement the data provided by Mix Market, in order to gain a better perspective of the overall picture of finance in India, it is also instructive to look at the annual National Bank for Agricultural and Rural Development (NABARD) report.²⁹ This report focuses on two distinct models of microfinance. First, the report looks at the SHG to bank linkage model, which is described as SHGs that are financed directly by banks including commercial banks, regional rural banks, and cooperative banks. The second model is the MFI – bank linkage model, which focuses on MFIs that are financed by banks and then on-lend to other SHGs or small borrowers. This thorough report offers a much more comprehensive view of microfinance in India.

²⁷ For more information on microfinance in South Asia see: <http://www.mixmarket.org/mfi/region/South%20Asia>. For Indian MFIs that report to Mix Market see: <http://www.mixmarket.org/mfi/country/India>. For Bangladesh see: <http://www.mixmarket.org/mfi/country/Bangladesh>.

²⁸ Forbes Magazine, "The Top 50 Microfinance Institutions (2007)", http://www.forbes.com/2007/12/20/microfinance-philanthropy-credit-biz-cz_ms_1220microfinance_table.html. Note: These were chosen from a field of 641 MFIs that have made available financial data and audits, and passed a review by Forbes advisors.

²⁹ National Bank for Agricultural and Rural Development, "Status of Microfinance in India – Annual Report," NABARD (2008-2009).

The 2008-2009 report states that there are 1,915 microfinance institutions in India, many of which are small in scope and size. A deeper analysis shows that these numbers are based on outstanding loans against NGOs/MFIs, so the actual number of MFIs might be less if several NGOs/MFIs have taken multiple loans to finance their activities.³⁰ In this sense, perhaps looking at the number of loans given to NGOs/MFIs does not offer a clear enough picture of the financial system in India. Perhaps reviewing the formal sector will create a better baseline. In the formal sector, according to the NABARD report, there are 27 public sector commercial banks, 28 private sector commercial banks, 86 regional rural banks, 31 state cooperative banks, and 371 district central cooperative banks. This means that 574 formal banks are taking part in some form of microfinance by either lending to MFIs or setting up programs of their own accord.³¹

In addition to NGOs, MFIs, and formal financial institutions, Self-Help Groups (SHG) are deeply ingrained into the fabric of financial institutions within India. Over the past three decades, SHGs have become the dominant microfinance model in rural areas within the country.³² For example, NABARD reports that there are over 61 million SHGs, which is an astonishing number of groups (see Appendix 3). These groups have approximately Rs. 5,545 crore, or \$55.5 billion USD in savings with various banks. Most groups save with commercial banks with 58 percent of all SHG saving over 50 percent of their savings in commercial accounts. Over 26 percent of SHG save with regional rural banks with about 36 percent of total savings in these accounts. Slightly over 15 percent of SHGs save in cooperative banks with 14 percent of total savings being deposited in these banks.³³ As this information suggests, even with a shift towards formalizing microfinance in India, many individuals favor the SHG model that has become the core financing option for many of the rural poor in India.

In a recent *New York Times* article about microfinance in India, the authors describe the country as “a Petri dish” for microfinance.³⁴ Indeed India represents a country that offers

³⁰ Ibid, 15.

³¹ Ibid, 8.

³² Anne Ritchie, “Community-Based Financial Organizations: Access to Finance for the Poorest,” *Innovations in Rural and Agricultural Finance*, Focus 18, Brief 3 (July 2010).

³³ NABARD, 10-11.

³⁴ Lydia Polgreen and Vikas Bajaj, “India Microcredit Faces Collapse From Defaults”, *The New York Times*, November 17, 2010: http://www.nytimes.com/2010/11/18/world/asia/18micro.html?_r=1

encouraging atmosphere for those interested in testing new products targeted to alleviating poverty in rural areas. In light of the evidence presented above, it makes sense why a research designed developed to target the poor in rural areas would be implemented in India. The long history of both agricultural policies and the familiarity with microfinance programs offers a comfortable atmosphere to test new products.

2.2 Why Focus on Potato Crops in India?

Potatoes play an integral role in both India's diet and economy. Potato has increasingly become a staple of the Indian diet, and ranks fourth in terms of domestic consumption behind wheat, rice, and maize. Furthermore, India ranks fourth in area under cultivation and third in potato production globally. Currently, India produces about 8 percent of potatoes worldwide. However, India's share of potato exports is rather insignificant at around 1 percent of global potato exports, which correlates with India's high domestic demand for potato products.³⁵

In terms of area under cultivation, the average remained stagnant around 1.3 million hectares from 2000 to 2005, and then reached a record high of 1.47 million hectares in 2008. As a result, potato production increased from 20 million tons to 30 million tons, which led to a glut situation forcing farmers to sell at lower prices or lose a significant portion of their crop in 2009.³⁶

Productivity in potato farming remains significantly lower in India compared to the global average. While the world average is around 35 to 40 tons per hectare, India averages around 20 tons per hectare. Studies show, however, that production is increasing due to better seed varieties.³⁷

³⁵ Karvy, "Seasonal Potato Report – India," (September 2009). On-line: http://www.karvycomtrade.com/downloads/karvySpecialReports/karvysSpecialReports_2009092211311.pdf. All of the Karvy numbers come from reports from the Food and Agriculture Organization (FAO) and the National Bank for Agriculture and Rural Development (NABARD). More information on potatoes in India can be found on the FAO website: <http://www.fao.org/countryprofiles/index.asp?lang=en&iso3=IND> and the NABARD website: <http://www.nabard.org/>. The authors of this paper have independently verified that the Karvy numbers are accurate.

³⁶ Ibid.

³⁷ Ibid.

West Bengal remains a key potato market in India. Currently, this region contributes 35 percent to domestic potato production, and ranks second only behind Uttar Pradesh which contributes 39 percent. However, even with such a high percent contributed to the domestic market, West Bengal lags behind the other states in terms of productivity. For example, Uttar Pradesh produces 22.32 tons per hectare whereas West Bengal produces 21.61 tons per hectare.³⁸

According to recent studies at the Karvy Institute, production in West Bengal has dropped by an astonishing 40 percent in 2009 as a result of a blight disease that hit the potato crops hard. Based on numbers provided by the National Horticulture Research and Development Foundation (NHRDF), production dropped from 9 million tons in 2008 to a mere 5.4 million tons in 2009 (over an area of 320,532 hectares). The good news is that production is expected to increase dramatically this year. Recent figures suggest that potato production will increase to 9.5 million tons in 2010 for the West Bengal region.³⁹

As this information clearly illustrates, potato farming is a critical sector in India. As mentioned above, a significant portion of the farming community grows potatoes – especially in West Bengal, which ranks number two in terms of production. As we saw during our fieldwork in West Bengal, potatoes are everywhere. Even if farmers diversify and grow other crops, a majority depends on potatoes for a significant portion of their annual income. Therefore, potato farming provides a natural platform to test an agricultural intervention due to the scale and sheer number of people involved. Although this might not be a stated intention of the research design, providing credit to farmers who grow potatoes might boost production and help increase the productivity, which statistics show is severely lacking in many of the potato markets in India including West Bengal. In the end, targeting a sector that impacts so many people offers a better chance of meeting the credit needs of a large portion of the rural, agricultural society in India.

2.3 Why Emphasize an Individual Lending Model in this Experiment?

A stark difference between the various models within this experiment is the emphasis on individual lending rather than group lending. The traditional model within microfinance provides

³⁸ Ibid.

³⁹ National Horticulture Research and Development Foundation (NHRDF). On-line at: http://www.nhrdf.com/contentPage.asp?sub_section_code=101

loans within a group context in order to utilize social pressure to ensure higher repayment rates. Many assume that this model continues to dominate the market today. However, as Maria Lehner argues, even though the literature is skewed towards discussing group loan models, a majority of MFIs are switching to a more individual based lending model.⁴⁰ Only recently have researchers begun to analyze the trend towards individual liability loans. The discussion below will add to this debate by analyzing the benefits and challenges to both group liability and individual liability models, with the goal of understanding why the individual model works best in the context of agricultural financing.

There are many benefits to group loans. First, the self-selection process of forming a group doubles as a screening device due to the fact that individuals are more likely to select credit worthy peers that can repay the loan. As Dean Karlan argues, this process allows an MFI to overcome inherent information asymmetries by taking advantage of social ties and peer pressure. Furthermore, the group acts as a sort of social collateral in the absence of actual physical collateral that is often required when anyone takes out a loan.⁴¹

Second, the groups take part in peer monitoring, which means that the social connections facilitate the monitoring process. This has two distinct benefits. The first benefit is that the group acts as a pressure mechanism to ensure that individuals do not default. The social pressure exerted by the group can force individuals to repay in order to avoid severe repercussions. Karlan suggests that these repercussions "... could be economic and result in reduced trading partner's for one's business, social and lead to loss of friends, or psychological and damage one's self esteem."⁴² Regardless of the type of repercussion, the group effectively acts as an enforcement mechanism, which studies suggest is a powerful tool in ensuring repayment rates at low costs to the MFI. This highlights the second benefit of group monitoring. This benefit is in terms of costs. Monitoring by the group decreases transaction costs because microfinance officers (MFOs) do

⁴⁰ Maria Lehner, "Group Lending versus Individual Lending in Microfinance," (Discussion Paper No. 299 - University of Munich August 2009): 3.

⁴¹ Lehner: 3.; Dean Karlan, "Social Connections and Group Banking," *The Economic Journal* Vol. 117 (February 2007): F57-F58.

⁴² *Ibid*, F58.

not constantly have to keep tabs on each client. As Karlan elucidates, "... group loans help formal lenders overcome the prohibitively high fixed costs of delivering small loans."⁴³

Finally, both group monitoring and group meetings for distributing loans and collecting repayments offer a structure that decreases costs while sustaining high repayment rates.⁴⁴ One of the main drivers of the group model is the exceptionally high repayment rate that has become the trademark of the GBL system. Some argue that moving towards individual loans will significantly increase costs while decreasing repayment rates. While this is the general theory, a recent paper by Karlan suggests this is not necessarily the case (as will be discussed below in more detail).

Group loans do not come without drawbacks. Beyond the stated benefits, there are also several challenges that these loans present. First, there might be social costs leading to tensions within the group and tensions outside the group. For example, tensions may arise if someone cannot repay, a member misses a meeting, or a member acts as a free rider within the group. These group tensions may lead to less incentive for the entire group to continue taking loans, and may result in the group disbanding. Furthermore, if the group sees someone constantly defaulting, they may start defaulting as well if they know the group may not last.⁴⁵

In terms of tensions outside of the group, some academics argue that women taking loans could lead to more tension inside the home for a couple reasons. Some authors offer anecdotal evidence that suggests that these loans lead to increase violence in the home. In a survey of one village, Rahman claims that 70 percent of Grameen borrowers expressed that violence in the household had increased as a result of the clients' participation in a microfinance program.⁴⁶ Of course, this is just one study in one village; however, it represents a common thinking in the field regarding tensions within households. Other authors, like Naila Kabeer, offer contrasting studies

⁴³ Ibid, F57.

⁴⁴ Lehner: 3; Karlan: F58-9.

⁴⁵ Ibid.

⁴⁶ Anne Marie Goetz and Rina Sen Gupta, "Who Takes Credit? Gender, Power, and Control Over Loan Use in Rural Credit Programs in Bangladesh," *World Development* Vol. 24, No. 1 (1996); Jude Fernando, "Nongovernmental Organizations, Micro-Credit, and Empowerment of Women," *Annals of the American Academy of Political and Social Science* Vol. 554 (1997); Aminur Rahman, "Microcredit Initiatives for Equitable and Sustainable Development: Who Pays?" *World Development* Vol. 27, No. 1 (1999).

to show that women are empowered and the power dynamic is shifting within the household in a positive manner.⁴⁷

In meeting with two women's groups during our fieldwork, we also heard stories about how women felt more empowered in their decision-making. Many women told us about how their husbands were happy to have a second income and often supported the women's businesses when they could. This is obviously not a rigorous test and only anecdotal evidence, but it does appear to be more likely that violence inside the home is an argument that might be systematically overstated.

Another challenge with group loans remains the inflexibility of the products. As individuals mature within the group, the demand often shifts for new products that MFIs with only group loans cannot provide. For example, if a client starts a business and it begins to flourish, then the need for larger loans might arise. However, these programs inadvertently place limits on wealthier borrowers.⁴⁸ As Xavier Giné and Dean Karlan argue in a new paper on group versus individual liability, "Heterogeneity in loan sizes can cause tension in the group as clients with smaller loans are reluctant to serve as a guarantor for those with larger loans".⁴⁹ In sum, the rigidity of the program due to the risk aversion of other clients in the group makes it difficult for growing entrepreneurs to gain the additional funds that they need to continue to expand. As a result, MFIs are not keeping up with the growing demand for new products by their clients.

In the past decade, many MFIs have begun to recognize that the traditional group based loan (GBL) model is too restrictive and not universally applicable. As a result, many institutions have started to shift towards various alternative models including group based loans with individual liabilities where repayment is still weekly during a group meeting, or by simply shifting to a model that extends an individual liability loan. The shift towards individual loans has been remarkable over the past few years. As Dean Karlan and Jonathan Zinman suggest,

⁴⁷ Naila Kabeer, "Conflicts over Credit: Re-evaluating the Empowerment Potential of Loans to Women in Rural Bangladesh," *World Development* Vol. 29, No. 1 (2001): 63-84.

⁴⁸ Beatriz Armendariz de Aghion and Jonathon Morduch, "Microfinance Beyond Group Lending," *Economics of Transition* Vol. 8, No. 2 (July 2000): 2.

⁴⁹ Xavier Giné and Dean Karlan, "Group versus Individual Liability: Long Term Evidence from Philippine Microcredit Lending Groups", (The Economic Growth Center, Yale University - Working Paper 970, May 2010): 6.

“recent estimates suggest that about one-half of microfinance institutions are individual liability lenders...”⁵⁰ Therefore, it is not accurate to denote that microfinance is solely based on a group lending methodology.

There are many reasons for why individual loans are better in some instances than group loans. Specifically, these loans may attract new clients who did not participate previously in microfinance programs because the group atmosphere did not suit their needs. In turn, this allows an MFI to increase its reach. Individual loans also permit MFIs to tailor the loan specifically for its clients’ needs. This is especially attractive for agricultural financing, which needs more flexibility in its repayment cycles. Individual loans also give a client more privacy. By taking away the group atmosphere, individuals do not have to disclose their financials to anyone other than the MFI. If there was a potential for social tension in a group atmosphere, individual loans can eliminate this risk as friends and family members no longer have to vouch or cover loans for another person. Finally, individual loans give an MFI the opportunity to monitor the uses of the loan more closely to ensure that it is going to the assumed purpose. This means that MFOs must become more actively engaged with individual clients, which could potential increase the costs of servicing these loans. Therefore, it is perhaps important to understand what roles existing structures or informal lenders can play in facilitating agent based monitoring practices.⁵¹

Individual lending also comes with some reservations. More monitoring might lead to increased costs of servicing a loan, as mentioned previously. Screening potential clients might end up being costly as well. To overcome these issues, Aghion and Morduch suggest clustering borrowers together to disperse and repay funds, utilizing agents within the community to facilitate the process, or using ‘dynamic incentives’ such as the threat of not renewing the loan for bad clients or promising larger loans over time for those with good repayment history.⁵²

The most emphasized concern is whether or not individual loans will lead to higher default rates. Theoretically, some argue that this will inevitably be the case. They argue that

⁵⁰ Dean Karlan and Jonathan Zinman, “Expanding Microenterprise Credit Access: Using Randomized Supply Decisions to Estimate the Impacts of Manila,” (The Economic Growth Center, Yale University – Working Paper 976, 2010): 2.

⁵¹ Lehner, 3-4; Giné and Karlan: 5-6, 23-4.

⁵² Aghion and Morduch: 6-9, 13-14.

without adhering to a model that promotes social collateral and social pressure, individuals will be less motivated to repay loans if they fall upon hard times. Due to the fact that individual liability loans are new to the microfinance field, many of the concerns are mere theories postulated by experts based on what they would expect to see in the field. There have been very few rigorous examinations of these theories. Fortunately, academics have recognized this gap in the literature, and have begun to implement studies on individual loans. The newest study, and perhaps very first of its kind, is a study recently published by Xavier Giné and Dean Karlan in May 2010.

Giné and Karlan systematically dispel the notion that individual loans will inevitably lead to a decrease in repayment rates. In their study, the authors conduct randomized trials within the Green Bank of Caraga in the Philippines. The first group was converted from the traditional MAU model to a group -model with individual liabilities. The second trial centered on the Green Bank of Caraga's expansion into new villages. Different villages were randomly assigned group loans, individual loans, or group loans that were then converted into individual loans. In the first trial, the authors found no change in repayment history. In the second trial, they also did not find any statistically significant changes in repayment across any of the groups.⁵³

As highlighted in the discussion above, when lending for agriculture, it becomes increasingly difficult to extend group loans because individuals are unwilling to vouch for another person due to the inherent risks involved with farming. As several MFIs have recently recognized, individual loans offer a better model for agricultural finance because the MFI can work with each individual farmer to tailor the repayment cycles to meet their needs. In many cases, longer repayment cycles that align with crop cycles offer a better structure for rural farmers.

Even though many recognize the usefulness of individual loans in the field of microfinance, few are willing to utilize individual loans outside of the traditional model. In other words, individual loans are beginning to pop up in urban areas to finance wealthier client's businesses, which ensures that MFIs continue to remain profitable. In the areas where individual loans are the most needed, like rural areas that need financing for agriculture, individual loans

⁵³ Giné and Karlan: 3-4.

remain noticeably absent. Even though studies like the one conducted by Gine and Karlan put to rest some crucial concerns, they do not address issues like collateral or loaning in the face of covariant risks. These concerns continue to keep MFIs from loaning to farmers in rural areas. In a review of ongoing project at the Poverty Action Lab (J-PAL) and Innovations for Poverty Action (IPA), there are no agricultural or microfinance products that address the issue of collateral or individual loans for farmers.⁵⁴ These studies mainly focus on a single issue such as the marketing, insurance, or information aspects of certain interventions, but they do not go as far as this study does in combining several key aspects of individual lending products in rural areas.

Therefore, one could argue that this research design is timely and unique in the sense that it is putting together a product that takes into consideration some of the more risky aspects of individual lending in an interconnected manner. By addressing these issues in a rigorous and thoughtful manner, this study can help move the discussion about financing rural, agricultural products forward by showing that individual loans without collateral offered to farmers in a similar geographic region can be profitable. The success of this project could finally lay to rest some critical preconceived notions about financing the rural poor, which could help expand the client base of an MFI while allowing it to reach individuals who are in dire need of financial products.

2.4 Innovation in Lending Mechanism:

The “Agent Intermediated Lending” [AIL] model is structured to reduce the major constraints to lending and borrowing in the rural agricultural space, namely; informational asymmetry, adverse selection, costly enforcement of repayment, moral hazard problem, dependence on informal lenders and monitoring. The AIL model is a digression from the general microfinance models that enforce joint liability and group lending contracts.⁵⁵ It is predominantly an individual lending model that capitalizes the social networks of rural landscapes and seeks to make agricultural microfinance sustainable. The structure is designed to

⁵⁴ Information on J-PAL projects can be found at: <http://www.povertyactionlab.org/>. Information on projects at IPA can be found at: <http://poverty-action.org/>.

⁵⁵ See Stiglitz (1990) & Varian (1990)

operate in the traditional agricultural marketing networks of traders, wholesalers, and other intermediaries, termed as middlemen.

When designing the AIL model, several stylized constraints were identified, that smallholder potato farmers in West Bengal faced. First, even after the general consensus about the profitability of selling potatoes out of a cold store versus selling off the ground, smallholder farmers had continually been making ground sales to traders. Farmers were risk averse and feared price fluctuations if they pursue such hold-up tactics. Second, they had been purchasing inputs on credit.⁵⁶ These farmers typically lacked complete information about the interest payments made on such purchases. Third, most of the farmers had been selling their harvests to the same traders, over a long period of time. This has led to the bolstering of the trust that these traders would give them the best price and would not renege on their contract to buy the harvest.

The traders in these networks provide credit to farmers on demand, whether in cash or as sale of inputs on credit. These traditional arrangements are convenient for the farmer but they erode any advantages of price comparison and informed decision-making, generally placing the farmer at a disadvantage.⁵⁷ The borrowers are typically made to overpay for inputs bought on credit from these middlemen as well as are underpaid for their stocks of production. They also extract high interest rates (of the order 4-5% per month) for cash lending. In the sections that follow, we will evaluate the impacts of the placement of this product in the traditional supply chain of potatoes in West Bengal, India and whether it can improve the profitability of smallholder agriculture by reducing the margins earned by middlemen.

2.5 Main Features of AIL:

Under this model, a commissioned agent (usually a middle man) is required to recommend borrowers from his own village. There is no requirement for collateral in this structure. The interest rate is lower than the informal sector. The agent's commission is dependent on the repayment rates of the borrowers. The borrowers on repayment of the first loan progressively receive larger loans. The repayment schedule is in conformity with agriculture. The loan contracts carry a 120-day window during which no repayments are due, in reflection of

⁵⁶ The degree of risk aversion varied with the size of land owned.

⁵⁷ See Ashraf, Gine & Karlan (2008)

the crop cycle and inherent lag between agricultural investments and harvest. There is also an insurance mechanism for covariate risk built into the model.⁵⁸

2.6 Analyzing the AIL model:

Recommendation: The agent recommendation requirement is one of the novel features of this type of lending mechanism. Its inclusion in the model solves problems manifold. The agent is a member of the village community. Through his social or business relations, he is acquainted with the financial health of the villagers and can screen credible borrowers. This information is vital and MFIs would have to incur costs to garner the same. By the virtue of its design, the model tries to mitigate the problem of asymmetric information (by screening⁵⁹) and lowers the transaction costs for an institution.⁶⁰

Collateral: In general, collateral serves to reduce the risk of strategic default in circumstances where borrower cash flows can be diverted. But there are problems of high transaction costs and risks of administering small and fragmented loans for collateral poor borrowers living in environments that are characterized by information asymmetry and weak enforcement mechanisms.⁶¹ This leads to risk aversion by MFIs and is reflected in their portfolios; consisting mainly of low risk-low return investments.

To substitute for physical collateral, MFIs exploit social relationships and trust among local people to enforce repayments. This highlights the use of such social collateral to replicate the enforcement role of more conventional types of collateral such as land and jewelry.⁶² Besley and Coate show how social collateral can reduce strategic default in some group lending situations. The AIL model has no collateral requirement; instead it utilizes the existing community links or social and business ties between the agent and the borrowers and tries to create a stronger enforcement of the same contract.

⁵⁸ Weather based and price based insurance

⁵⁹ See Varian (1990)

⁶⁰ Information gathering costs, monitoring and default costs are included in the explicit costs that MFIs have to bear.

⁶¹ See Stiglitz & Weiss (1981)

⁶² See Bond & Rai (2002)

Incentives: The incentives in this model are pivotal and best understood when demarcated by actor. There are iterated interactions between the lending agency and the borrowers, is termed as “dynamic incentives.”⁶³ This model is targeted towards agricultural lending and the borrowers will thus have consecutive credit needs for various processes throughout the crop cycle. It is the option of receiving continual credit over the crop cycle, reduces the probability of default on the current loan.

The loan size in the successive cycles will be progressively higher. The “progressive lending” mechanism in this model improves the borrower’s incentives to pay, in addition to the dynamic incentives.⁶⁴ From the MFI’s stance, progressive lending is a safer option. As this model starts out with a small loan value, the loss due to realized default risk will be lower than if there were loan installments of uniform size but higher value.

The agent’s incentives in this model are both explicit and implicit. The commission he receives from the MFI is his explicit incentive.⁶⁵ As the value of commission is dependent on the repayment rates of the borrowers, he is strongly incentivized to ascertain that borrowers make timely repayments and this aligns the MFI’s motives with the agent’s. To confirm timely repayment rates, the agent would have to monitor the activities of the borrowers, leading to lower moral hazard risk ingrained in individual lending. It replicates the peer monitoring in group lending mechanisms but does so with lower costs.⁶⁶ Collusion between the agent and borrower is a plausible scenario, but the likelihood of collusion against the MFI, may be lower than group lending mechanisms, due to the implicit incentives to the agent.⁶⁷

The implicit incentives of the agent may have an intriguing range depending on the setting, the agent’s social position and bargaining power in the same. The later sections of this report discuss the potential implicit incentives to the agent and how their interaction with other variables in the model impact outcomes.

⁶³ See Besley & Coate (1995) and Morduch (1999)

⁶⁴ See Jain & Mansuri (2003)

⁶⁵ Whether the commission would be an apt monopoly rent for the information is to be tested.

⁶⁶ Peer monitoring has intrinsic opportunity costs and also may lead to mistrust and waning of social cohesion.

⁶⁷ See Ray (1998)

Repayment: The schedule for repayment in this model bears congruence to the liquidity scenarios of agricultural households. It is a contrast to most Grameen Bank-like microcredit schemes where borrowers are required to repay their loan in tightly structured installments (e.g., the loan repayment schedule for borrowers from Grameen Bank typically requires repayment in weekly installments over a year, with the first installment due immediately).⁶⁸ Linking the ease to pay of borrowers with the repayment schedules is one of the stronger motivations behind the design of this model.

There clearly are inefficiencies imposed due to the higher frequency of repayments in the Grameen Bank-like models. For one, it limits the types of projects that can be financed with microcredit loans. Long-gestation projects, or even seasonal working capital needs for agricultural production, are difficult to finance solely by loans for which repayments begin long before the returns from the project are realized. Also, there are considerable transactions costs of making the repayments at weekly meetings of the members of each ‘center,’ or collection of groups.⁶⁹

As stated earlier, reducing dependence on informal credit is one of the main focuses of the AIL model. Jain and Mansuri have provided evidence that since the borrower under the Grameen Bank-like schemes, knows that repayment must begin almost immediately after loan disbursement, and typically much before project returns are realized, he must be able to access funds to finance the installment. Thus, the MFI, by enforcing a high frequency installment repayment contract, indirectly co-opts the informal sector.⁷⁰

Insurance: So far the micro-finance institutions and programs have been focusing on providing savings and credit services only. However a growing number of MFI practitioners and promoters have recognized that providing credit is not enough for the sustainable development of the people.⁷¹ The insurance provided by MFIs faces supply side constraints like high transaction costs, high upfront investments to reduce risk so that premiums are affordable, lack of reinsurers’

⁶⁸ See Jain & Mansuri (2003)

⁶⁹ Ibid

⁷⁰ Ibid

⁷¹ Balasubramanyam (2000)

interest in this product, and limited availability of risk capital and technical know-how⁷². The AIL model has a price based and a weather based insurance built into it. The uniqueness of this feature lies in it being instantaneous. The surveys revealed that the insurance feature on other loans from various credit organizations in the area take about six months to a year to actually be realized, while the AIL model waives the insured amount in very same period. This provides some stability in the incomes of small farmers and urges them to reduce their risk aversions.

3. Evaluation design:

The evaluation was conducted in the districts of Hooghly and Medinipur, in association with the local NGO- MFI, Sri Sanchari⁷³. Six villages were selected based on the crop type, that was potato and having residents who were desirable potential borrowers.

In each village, a baseline survey was conducted in 2009. Information was collected on household composition, education, employment, asset ownership, input expenditure, crop cultivation patterns, type of land holding contracts, borrowing, saving, and post harvest use of crops. Table 1 below provides a list of all the variables that the survey involved, in block format. A total of 300 households were surveyed. The households were surveyed to maintain baseline data balance. (See Appendix 4)

Table 1 – Surveyed Variables

Block	Topic
Block A	Identification (by household)
Block B	Household Information (by household)
Block C	Household Characteristics (by member)
Block D	Land Ownership (by plot)
Block E	Land Cultivated (by plot)
Block F	House or Dwelling
Block G	Other Assets
Block H	Crops in the Field (by crop)
Block I	Crop Inputs (by crop)

⁷² Ruchismita & Varma (2009)

⁷³ Sri Sanchari has been operating in the area for three decades and has focused on various capacity building programs along with the extension of credit in the group-lending format.

Block J	Crops Recently Harvested (by crop)
Block K	Uses of Crop after Harvest (by transaction)
Block L	Income (by household and member)
Block M	Remittances and Other Income (by member)
Block N	Credit (by loan)

The baseline survey revealed that cultivation was one of the major occupations in the two districts accounting for almost 26% of individuals engaged in it, in Medinipur and 13% in Hooghly. It also revealed that almost 65% of farmers were marginal (owned less than an acre of land) and 72% of these cultivated the Jyoti variety of potato. The figures are most staggering for the post harvest usage of crops. About 77% of the farmers reported that they made ground sales versus 10% who said they used the cold storage, in Medinipur. In case of Hooghly, the distribution was more even, there were 31% who made ground sales and 31% who used the cold storage. This is implicit from the fact that there is higher percentage of medium and large farmers in Hooghly and they are less risk averse as compared to the other land holding classes. The next section will provide an in depth analysis of the surveyed variables and the descriptive statistics, to better explain the setting of the experiment.

The experiment is composed of three forms of microcredit: GRAIL (Gram Panchayat [local government] agent-intermediated lending), TRAIL (trader agent-intermediated lending) and GBL (Group Based Lending). In the agent-intermediated lending models, a commissioned agent (selected by the local government in GRAIL, or a local trader who has applied to be the agent in TRAIL⁷⁴) is used to allocate loans on an individual basis. For the GBL, Sri Sanchari allocates loans according to its typical group-lending model with joint liability, albeit also employing the same randomization scheme as in TRAIL and GRAIL groups as described below.

Randomization took place at three levels, village, hamlet and individual (or household). Villages were randomly allotted to one of the three models. Two paras (hamlets) within each village were selected randomly to belong to either the credit treatment or non-credit control group. In both agent-intermediated models, the agent recommends twenty potential borrowers from each para, of which ten from the selected credit para are offered the loan product. The

⁷⁴ An applicant was selected as a TRAIL agent if he had a clientele base of greater than fifty. While a GRAIL agent was nominated by the local government.

remaining ten recommended households from the credit para are also surveyed as controls, as well as ten households chosen randomly from the list of recommended households from the non-credit para, ten non-recommended households from the non-credit para, and ten non-recommended households from the credit para, for a total of fifty surveyed households.

In GBL, two paras from each village are randomly selected to be credit or non-credit. The MFI elicits four self-selected groups of five borrowers to apply from each para and randomly selects two groups from the credit para to receive a loan. The remaining two groups from the credit para are also surveyed as controls, as are two of the groups from the non-credit para, and ten households from each non-credit para that did not apply in a credit group, for a total of fifty surveyed households per village. Thus the sample consists of 300 households across six villages in two districts (See Appendix 5 & 6 for details).

In contrast to the general microfinance frameworks, TRAIL and GRAIL loans were administered on an individual agent basis and GBL loans were administered by Sri Sanchari. The loan amounts in the pilot phase started at \$40 and progressed to \$60, under the dynamic incentive feature of the AIL model. The interest rate charged in the pilot phase was 1.5% per month⁷⁵. The treatment groups under the three types of credit models did not require immediate weekly or monthly repayment installments as is standard microfinance practice. Instead, the loan contracts carried a 120-day window during which no repayments are due. The commissions of the respective agents depended on the repayments made by the borrowers ensuring higher monitoring and information exchanges.

Most of the treatment farmers used family labor for cultivation and very few utilized manual labor from other sources. Almost all the farmers feared that their kin would migrate out of cultivation to more profitable employments, and in the future agriculture would no longer be sustainable. Almost 90% of the small and marginal farmers had no access to mechanized inputs. All the farmers used the traditional networks described in the previous section, to market their produce. Almost 80% of all the farmers have interactions with less than 3 traders. Most produce transactions are cash-on-purchase by the trader, and most occur at the ground. Sometimes the credit repayments are made by giving the trader a part of the produce. The farmers, who used the

⁷⁵ This is the same rate of interest at which an MFI borrows from the bank.

cold storage for potatoes, bore the transport costs of their produce. For the transportation of potatoes to the cold storages, the farmers used a wide variety of vehicles, from motorized carts to tractors to bullock carts.

The disbursement of the first cycle of loan was delayed and thus was not expected to have an effect on the input and output decisions in potato farming. The follow up survey revealed that most treatment households had either utilized the first cycle loans to improve the productivity of the field by investing in irrigation or had purchased inputs for other crops like okra and paddy.

One of the most intriguing parts of this experiment is the repayment rate. The pilot phase recorded almost 100% repayment rates, falsifying the hypothesis, that there are moral hazard and non-repayment issues ingrained in individual lending models, in this case.

4. Econometric Modeling and Analysis:

The question of our research is how to measure the impacts of different types of loans on farmers. The impact will be measured from the recommendation patterns side, the production side, as well as marketing side, using transaction data based on the household survey. From the production side we will look into the impact in terms of the yield and storage proportion while from the marketing side we will look at the impact on transaction price.

4.1 Descriptive Statistics - The Sample Population of the Two Districts:

Initially, this survey data provides a partial snapshot of the 300 sample households, and trends quickly begin to emerge. First of all, most of these households hold few household and productive assets. Secondly, there are consistent differences between the two districts included in the survey. Hooghly is closer to Kolkata, and is relatively wealthier, and accordingly, descriptive statistics are displayed separately by district.

Block B: Household Information

On average, households in both districts contain slightly less than five members. Heads of household are in their forties, and in Hooghly they tend to be slightly older. In both districts, over 95 percent of families have lived in their communities for over two generations. We do see some significant differences among districts in terms of caste and religion. In Hooghly, there is a

large minority Muslim population. This could potentially affect the accuracy of data collection with regards to credit, since Islamic usury laws prevent the collection of interest, and could therefore contribute to traders and input sellers in these communities changing interest indirectly through fees. In Medinipur, well over half of the households belong to a scheduled caste. In general, this a marker of a legacy of economic and social disadvantage, but since these castes are now guaranteed certain protections by the Indian Constitution, members of a scheduled caste may be more likely to be recommended for the pilot program by a GRAIL agent.

Table 2: Demographic Household Data by District

	Hooghly						Medinipur					
	Observation	Rel. freq (%)	Mean	St. dev.	Min	Max	Rel. freq (%)	Mean	St. dev.	Min	Max	
Size (# members)	< 4	30.4	4.73	2.33	1	15	18.8	4.85	1.72	1	11	
	4 – 6	55.4					67.1					
	7+	14.2					14.1					
Age HH head	<40	18.1	49.8	11.6	20	87	31.6	45.8	12.3	25	80	
	40-59	59.8					52.0					
	60+	22.1					16.4					
Gender HH head	Male	98.6					94.7					
	Female	1.4					5.3					
Newcomers (<2 generations)	Yes	1.4					4.0					
	No	98.6					96.0					
Caste	SC	10.8					63.8					
	ST	-					2.0					
	OBC	0.7					-					
	Other	88.5					34.2					
Religion	Hindu	74.3					100.0					
	Muslim	25.0					-					
	Other	0.7					-					

Source: Musgrave 2010

Block C: Household Characteristics

Data regarding some crucial demographic characteristics of each household member yielded key insights into educational attainment and primary occupation within the family, and also reinforced a wealth and development gap between the two districts

With regards to education, both districts have comparable child school enrollment figures, while adults in Hooghly are generally more educated and more likely to be literate. In addition, in Hooghly there is a narrower gender gap in terms of education, with males having less than one year's advantage on average. In Medinipur, on the other hand, men generally have

twice as many years of schooling as women. Hooghly also has larger maximum household education level, as well as lower levels of adult illiteracy. In both districts, the female illiteracy rate is double that among males. Differential educational levels among participants in the pilot may potentially affect outcomes, as more educated farmers may be able to avoid paying marked-up prices for inputs (because they can read the price on the package), or may be able to calculate profit margins and interest rates. More generally, educated farmers may be more confident in their abilities to evaluate new situations, allowing them to take advantage of opportunities and bear more risk. Conversely, low educational attainment levels could be one of the many reasons that we see such incredibly high levels of risk aversion among farmers in both districts.

Table 3: Educational Attainment of Household Members by District

		Hooghly			
		Mean/observation	St. dev.	Min	Max
Children: school enrollment	All	73.6			
	Boys	69.1			
	Girls	79.5			
All adults: highest education completed	All	6.46	3.97	0 (Illiterate)	15 (MA/MS)
	Men	6.81	3.96	0	15
	Women	6.05	3.96	0	15
HH heads: highest education completed		5.76	3.77	0	15
HH max education completed		9.25	3.01	1	15
Adults: illiteracy	All	13.6			
	Men	9.5			
	Women	18.4			
		Medinipur			
		Mean/observation	St. dev.	Min	Max
	All	74.8			
	Boys	76.0			
	Girls	73.5			
	All	3.64	3.94	0 (Illiterate)	15 (MA/MS)
	Men	4.74	4.21	0	15
	Women	2.37	3.17	0	13
		2.88	3.41	0	14
		7.05	3.82	0	15
	All	38.1			
	Men	27.3			
	Women	50.5			

In terms of primary occupation, twice as many adults in Medinipur as in Hooghly identify cultivation as their primary economic venture, whereas considerably of the sample households in Hooghly are engaged in occupations such as business, government or private services. Some of these differences can be explained in light of Hooghly's relative proximity to Kolkata and relative urban environment. Unemployment is also significantly higher in Medinipur.

Table 4: Primary Occupation of Household Members by District

		Cultivation	Labor	Business	Private Service	Govt	Housework	Student	Unempl	Pension	Other
Hooghly	All adults	13.0	15.4	6.9	8.7	1.6	42.2	4.3	2.8	--	5.1
	Males	24.2	27.1	12.1	16.1	2.6	0.4	5.5	4.4	--	7.8
	Females	0.0	1.7	0.9	0.0	0.4	91.0	3.0	0.9	--	2.1
	HH heads	39.6	30.2	15.4	5.4	2.7	1.3	--	1.3	--	4.0
	If working outside home	28.6	33.8	15.2	19.0	3.5					
	Males	29.5	33.0	14.7	19.6	3.1					
	Females	0.0	57.1	28.6	0.0	14.3					
Medinipur		Cultivation	Labor	Business	Private Service	Govt	Housework	Student	Unempl	Pension	Other
	All adults	26.2	15.4	1.9	0.2	0.4	44.0	4.4	4.9	1.1	1.3
	Males	47.8	26.9	3.6	0.4	0.8	1.2	7.1	8.3	1.6	2.4
	Females	1.4	2.3	0.0	0.0	0.0	93.6	1.4	0.9	0.5	0.0
	HH heads	56.6	26.3	4.0	0.7	0.7	3.3	--	4.0	2.0	2.6
	If working outside home	59.3	34.9	4.3	0.5	1.0					
	Males	60.2	33.8	4.5	0.5	1.0					
Females	37.5	62.5	0.0	0.0	0.0						

Source: Musgrave 2010

Block D: Land Ownership

Based on the amount of land owned, all sample households were placed into one of four land class categories ranging from landless to medium-size. Then all additional descriptive statistics regarding land ownership were stratified according to these categories. In Hooghly, we see more landless families, often due to the fact that these families have other occupations and sources of income, but we also see the presence of some medium-size land holders – a category that is completely absent in Medinipur. In both districts, the majority of households are marginal farmers that hold less than one acre of land.

Table 5: Land Class by District

	% of HHs	
	Hooghly	Medinipur
Landless	31.1	20.1
Marginal (<1.0 acres)	61.5	69.1
Small (1.0-2.5 acres)	5.4	10.7
Medium (2.5-5 acres)	2.0	-

Source: Musgrave 2010

When the data is stratified according to the given land class categories, average acreage owned, number of plots, and plot size becomes roughly equivalent. In general, small farmers in Medinipur tend to own slightly more land divided into a greater number of larger plots.

Table 6: Landownership Data by District (Stratified by Land Class)

	Hooghly					Medinipur				
	All	0.13	0.10	0.02	0.75	All	0.13	0.10	0.01	1.00
Plot size (acres)	Hooghly					Medinipur				
	Marginal	0.10	0.07	0.02	0.48	Marginal	0.13	0.08	0.01	0.42
	Mean		St. dev.	Min	Max	Mean	St. dev.	Min	Max	
	Small	0.15	.11	0.03	0.75	Small	0.27	0.22	0.07	1.00
Acreage (owned)	All	0.34	0.57	0.0	4.0	All	0.39	0.48	0	2.42
	Medium	0.25	0.15	0.04	0.66	Medium				
	All >0	0.51	0.62	0.02	4.0	All >0				
	Marginal	0.33	0.23	0.02	0.95	Marginal	0.33	0.23	0.01	0.99
Number of plots (owned)	Small	1.31	0.32	1.0	1.83	Small	1.53	0.50	1.00	2.42
	Medium	3.45	0.61	2.79	4.0	Medium				
	All	2.76	3.12	0	17	All	2.94	3.72	0	19
Source: Musgrave 2010	Marginal	3.25	1.86	1	8	Marginal	2.70	2.09	1	12
	Small	8.75	2.71	5	13	Small	10	6	1	19
	Medium	14	3.61	10	17	Medium				

Block E: Land Cultivated

In terms of cultivation, the differences between the two districts become more pronounced. While there is a similar percentage of households farming in both districts, landless households in Medinipur are much more likely to cultivate crops, perhaps due to a lack of other occupational alternatives. Households in Hooghly that do own land are significantly more likely to use it for cultivation, and land in this area is relatively more fertile. In Medinipur, a larger portion of land is likely used for grazing livestock, as is evidenced by the fact that 85 percent of households in Medinipur own livestock as compared with only 47 percent in Hooghly. After stratifying by land class, we see that households in Medinipur tend to cultivate more land, more plots, and larger plots, with the exception of the landless.

Table 7: Cultivation Relative Frequencies by Land Class

Land class	Hooghly		Medinipur	
	% of all district cultivating HHs	% of HHs cultivating (any crop)	% of all district cultivating HHs	% of HHs cultivating (any crop)
All	100.0	70.9	100.0	71.1
Landless	11.4	26.1	13.2	46.7
Marginal	79.0	91.2	74.5	76.7
Small	7.6	100.0	12.3	81.3
Medium	1.9	66.7	--	--

Source: Musgrave 2010

Table 8: Cultivation Data by District (Stratified by Land Class)

	Hooghly				Medinipur					
	Mean	St. dev.	Min	Max	Mean	St. dev.	Min	Max		
Acreage (cultivated)	All	0.27	0.43	0	3.53	All	0.37	0.43	0	2.1
	All >0	0.38	0.47	0.02	3.53	All >0	0.52	0.43	0.02	2.1
	Landless	0.75	1.01	0.02	3.53	Landless	0.39	0.39	0.1	1.2
	Marginal	0.27	0.26	0.03	1.47	Marginal	0.42	0.28	0.02	1.32
	Small	0.68	0.40	0.17	1.24	Small	1.23	0.56	0.40	2.1
	Medium	1.29	0.45	0.97	1.61	Medium				
# of plots (cultivated)	All	2.13	2.77	0	22	All	2.33	2.73	0	15
	All >0	3	2.87	1	22	All >0	3.27	2.72	1	15
	Landless	4.25	6.0	1	22	Landless	1.93	1.64	1	6
	Marginal	2.54	1.92	1	12	Marginal	2.75	1.59	1	7
	Small	5.25	3.11	1	9	Small	7.92	4.23	1	15

	Medium	5.5	0.7	5	6		Medium				
Plot size (acres)	All	0.13	0.08	0.02	0.58		All	0.16	0.10	0.01	0.62
	Landless	0.18	0.12	0.02	0.58		Landless	0.20	0.11	0.06	0.58
	Marginal	0.11	0.07	0.02	0.35		Marginal	0.15	0.09	0.02	0.42
	Small	0.13	0.07	0.03	0.36		Small	0.16	0.12	0.01	0.62
	Medium	0.23	0.10	0.06	0.41		Medium				

Source: Musgrave 2010

Block F: House or Dwelling

Data collected on the housing quality of the sample population clearly demonstrates the disparities between the two districts. Houses in Hoogly are relatively larger, and have more rooms. They are also more likely to be constructed out of brick instead of mud, and to have a paved floor. Furthermore, in Hoogly, 89.9 percent of households had electricity, compared to only 48.3 percent in Medinipur. In addition, 57.4 percent of households in Hoogly had a toilet, while only 7.4 percent in Medinipur had one.

Table 9: Housing Data by District

		Mean	St. dev.	Min	Max	Hoogly		Medinipur	
						Wall material	Rel. freq (%)	Floor material	Rel. freq (%)
Hoogly	House area (acres)	0.03	0.016	0.01	0.09	Mud	29.7	Mud	39.9
	Homestead area (acres)	0.03	0.044	0.01	0.33	Tin	-	Paved	60.1
	# of rooms	2.2	1.2	1	8	Brick	70.3		
	# of floors	1.1	0.41	1	4				
Medinipur	House area (acres)	0.018	0.010	0.01	0.08	Mud	93.9	Mud	93.3
	Homestead area (acres)	0.039	0.58	0.01	0.42	Tin	0.7	Paved	6.7
	# of rooms	1.9	0.91	1	4	Brick	5.4		
	# of floors	1.4	0.50	1	3				

Source: Musgrave 2010

Block G: Other Assets

As is consistent throughout the data, households in Hoogly tend to more likely to own certain key household durables, and are also likely to own larger quantities of these items as compared to households in Medinipur. In the case of some of these products, such as phones or financial services, households in Hoogly may have better access due simply to geographical proximity. We do note, however, that savings book passbook ownership is actually higher in Medinipur, which tends to discount these hypothesis, at least in terms of financial services. Other durable items which require electricity are naturally more likely to be owned by households in Hoogly, since more of these houses have electricity.

Table 10: Asset Data by District

	Hoogly			Medinipur		
	% HH	Mean (if > 0)	St. dev.	% HH	Mean (if > 0)	St. dev.
Radio	23.0	1.03	0.17	9.4	1	0
Television	43.9	1.04	0.21	19.5	1	0
Bicycle	89.9	1.42	0.59	82.6	1.2	0.42
Motorcycle/moped/scooter	11.5	1.06	0.24	2.7	1	0
Wall clock	91.9	1.65	1.01	65.8	1.1	0.22
Fridge	9.5	1	0	2.7	1	0
Fan	85.8	1.95	1.17	29.2	1.4	0.53
Heater	0	-	-	0	-	-
Kerosene/gas stove	52.0	1	0	2.7	1	0
Landline phone	7.4	1	0	0.7	1	-
Mobile phone	62.8	1.43	0.88	41.6	1.03	0.18
Sewing machine	0	-	-	0	-	-
Savings bank passbook	78.4	1.32	0.65	95.3	1.1	0.33
LIC/Insurance policies	47.3	1.4	0.94	40.9	1.1	0.50
Liquefied petroleum gas	18.2	1	0	0.7	1	-

Source: Musgrave 2010

Block H: Crops in the Field for Cycle I

Cycle I data was collected during the potato season, and clearly shows that potato is the primary crop in these districts, and almost all households cultivate it. The main variety cultivated in both districts is Jyoti, while in the wealthier district of Hoogly, almost half of the households also cultivate Chandramulki, which is a more expensive variety that fetches higher profits.

Qualitative surveys revealed that most farmers believed that potatoes were not their most productive crop, however, and so we can see the greater diversity of crops grown in Hooghly as a sign of their ability to potentially take advantage of more profitable opportunities.

Table 11: Crop Data by District

Hooghly			Medinipur		
Crop	% cultivating HHs	% district cultivated area (acres)	Crop	% cultivating HHs	% district cultivated area (acres)
Potato	97.1	94.8	Potato	99.1	98.0
<i>Jyoti</i>	72.3	69.5	<i>Jyoti</i>	89.6	83.0
<i>Chandramul khi</i>	43.8	24.9	<i>K22</i>	12.3	9.0
<i>Pokraj</i>	1.0	0.4	<i>Pokhraj</i>	10.4	6.1
Mustard	2.9	1.5	Mustard	2.8	1.8
Potol	1.0	0.4	Sweet potato	0.9	0.2
Wheat	1.9	0.8			
Pumpkin	1.0	0.4			
Cabbage	1.0	0.1			
Onion	1.0	0.1			
Okra	1.0	0.2			
Pea	1.0	1.3			
Lentil	1.0	0.4			

Source: Musgrave 2010

Block I: Crop Inputs

Data on crop inputs in cycle I again shows clear disparities between the two districts. As households in Hooghly are relatively wealthier, and tend to cultivate smaller plots, it is unsurprising that they can afford to spend more per acre, with the exception of the landless class. The landless in Hooghly cultivate more land on average than the landless in Medinipur, and therefore the expenditure per acre is lower for this group. In both communities, most farmers purchase outside seeds and almost all buy inorganic fertilizer, which both allows them to take advantage of agricultural developments and tethers them to a yearly cycle of purchasing inputs with cash or credit, rather than self-provisioning

Table 12: Crop Input Data by District

		% of total village input expenditure		% HHs purchasing	Expenditure per acre (Rs per acre), if > 0			
					Mean	St. dev	Min	Max
Hooghly	All inputs	All HHs	100.0		27424	9342	9279	45900
		Landless	28.1		22995	6602	13987	38200
		Marginal	58.1		28947	3915	11568	45900
		Small	10.2		24945	9991	12129	40750
		Medium	3.6		19061	13833	9279	28843
	Local seeds	4.8	15.6	10939	4644	2720	21000	
	Outside seeds	32.4	68.8	12199	5453	1897	22667	
	Organic fertilizer	0.6	6.5	4969	6812	514	16667	
	Inorganic fertilizer	26.6	97.4	7317	3043	3000	16950	
		% of total village input expenditure		% HHs purchasing	Expenditure per acre (Rs per acre), if > 0			
					Mean	St. dev	Min	Max
Medinipur	All inputs	All HHs	100.0		24229	6999	9083	48286
		Landless	9.3		25955	10638	11619	48286
		Marginal	61.6		24593	6370	9083	40150
		Small	29.1		20570	4709	13095	27393
		Medium						
	Local seeds	0.8	8.4	7248	3824	1818	12000	
	Outside seeds	45.8	89.5	11586	4403	1746	23929	
	Organic fertilizer	0.5	8.4	1858	1217	480	4000	
	Inorganic fertilizer	23.8	97.9	5607	2004	2188	12619	

Source: Musgrave 2010

Block N: Credit

Loan amounts in both districts are relatively equivalent, until loans in Hooghly seem to have slightly less variance. Over half of all loans are also reported to be interest-free, which means that interest is likely collected in fees or in payment in kind. Hooghly, as home to a Muslim majority, reports an even higher rate of interest-free loans. In Medinipur, over half of all loans were taken for consumption purposes, and no business-related loans were taken out. Hooghly, reflecting a more urbanized society with numerous small business opportunities, some business loans were taken, and relatively less agricultural loans. Households in Hooghly report that “other” was a significant purpose for taking out a loan, and future surveys could delve into this reasoning in more depth. In addition, over 65 percent of household loans in both districts are taken from traders. This is a significant finding because it points to the fact that traders may be collecting interest from loans in ways that the survey is not measuring. It also indicates that informal credit is an incredibly important factor in these communities, and that a scaled-up intervention that provides better terms than the traders are offering could considerably boost a household’s income.

Table 13: Credit by District

		Hooghly					Medinipur				
	observation	Rel. freq	Mean	St. Dev.	Min	Max	Rel. Freq	Mean	St. Dev	Min	Max
Amount of loan	<1,000	35.3	6,092	10,747	80	70,000	30.5	5,944	11,661	100	160,000
	1,000-5,000	37.8					31.3				
	5,001-25,000	22.6					25.3				
	25,000+	4.2					3.0				
Interest Rate of loan	0%	64.7	3.78	2.31	0	15	51.1	3.14	2.01	0	10
	0-5%	28.4					47.5				
	5+%	6.9					1.4				
Source of loan	Relative/friend	16.2					10.1				
	Trader	65.0					67.3				
	Institution	12.0					17.2				
	Other	6.8					5.4				
Purpose of loan	Agriculture	30.2					41.2				
	Business	4.3					-				
	Consumption	10.8					51.4				
	Other	54.7					7.4				

4.1 Selection Bias in Recommendations for the Pilot Program:

Because this was an agent-intermediated model, participants were not strictly randomly selected. Each agent recommended a number of clients, and then a smaller number of pilot participants were randomly selected from this group. Therefore, measuring the differences between those recommended for the program and those not recommended for the program can help us in two ways. Firstly, it can allow us to discern systematic initial differences between the treatment and control groups, in order to more accurately measure that total impacts of the program. Secondly, we can determine if agents are merely choosing borrowers who are likely to repay, or if TRAIL and GRAIL agents have other interests in selecting borrowers with specific characteristics.

In the group-based lending case, as in most microfinance projects, groups must self-form to receive loans, and so selection bias clearly becomes an issue that obscures the true effect of microfinance on the average household. In this case, we simply compare the treatment group

with the control group, to elucidate any systematic differences between those who receive microfinance and those who do not.

Specification of the Model

A Logit model predicting the binary outcome of being recommended or not was used to measure selection bias. We assumed that several indicators of household wealth and ability to repay the loan would be significant in predicting this outcome. On the right hand side, we included the head of household's age as a measure of the stability of household, as well as the number of household members as a measure of potential productive capacity. As measures of wealth, we included the amount of land owned, the number of large livestock owned, and the number of rooms in their house.

It proved extremely difficult to choose useful measures of creditworthiness for these households. Theoretically, the interest rate that a household pays on its other loans can represent how risky it might be to loan to these households, assuming that households who had defaulted on previous loans will now have to pay a higher price to get new credit. As the descriptive statistics have shown, however, the majority of households claim that they pay no interest on their loans, therefore muting the potential explanatory power of this indicator. In addition, if credit options are very limited on the supply side, the interest rate that households pay may conceivably may more to do with the options available in their community rather than their household-level characteristics. Nonetheless, we created a weighted average of the interest rates of all of the loans taken out in each household. We also included a binary variable indicating whether the households own a savings passbook and a measure of the total debt that each household carries.

We also included a village dummy to control for village-level variance, as well as religion and caste dummies in order to pull out potential differences in recommendation due to non-economic factors.

Results

The results show three different selection processes that are based on different characteristics. In the case of GRAIL villages, landless households that own less land and do not have a savings passbook are more likely to be recommended. This may reflect the fact that these agents see the pilot as an extension of anti-poverty programs, and want to target the most needy (who might also become a large source of potential political supporters).

In the case of TRAIL villages, both Muslims and those belonging to a scheduled caste or tribe are less likely to be recommended for a loan, perhaps alluding to the necessity of having social status and connections. Some economic considerations may also come into play, as landless households are also less likely to be recommended, and households with a savings passbook are slightly more likely to be recommended. The trader may choose households that are not too well-off, however, in order to exploit some potential vulnerabilities, as evidenced by the fact that households that own less land are also more likely to be chosen (and this result is significant at the 5 percent level).

Finally, In the case of group-based loans, poorer households – meaning those that owned less land or did not own a savings passbook – were more likely to be in the program, and landless households were almost twice as likely to participate (with this particular result being significant at the 10 percent level. The most striking result, however, was that as the average interest rate of a household's loans increased by one unit, that household became almost 18 times more likely to participate in group-based lending (with this result also being significant at the 10 percent level). This leads us to believe that the people who take-up this microfinance program have a strong motivation to do so based on the fact that they are

As the qualitative survey later showed, other unmeasured and immeasurable factors for selection abounded in these communities, and this model certainly cannot capture them all. In both the GRAIL and TRAIL cases, we believe family connections may be a significant factor in selection. In GRAIL villages, political party may correlate strongly with recommendation, while in TRAIL villages, the trader may wish to choose families with whom he has long-term economic relationships.

Table 14 - Results

	GRAIL Recommended	TRAIL Recommended	GBL Loans
Village Dummy	-0.781 (1.306)	0.269 (1.534)	-0.418 (1.545)
Religion Dummy	---	-0.793 (1.247)	---
Caste Dummy	-0.482 (1.011)	-1.935** (0.826)	2.018 (1.312)
HH Age	0.010 (0.022)	0.054** (0.026)	0.046 (0.0364)
HH Size	0.246 (0.182)	-0.365 (0.287)	-0.075 (0.251)
Land Owned	-0.654 (0.876)	-0.948** (0.481)	-0.188 (1.231)
Landless Dummy	0.822 (0.650)	-0.967 (0.730)	1.776* (1.055)
Rooms in House	0.108 (0.261)	0.060 (0.264)	0.294 (0.582)
Livestock	-0.208 (0.506)	-0.184 (0.764)	-0.199 (1.297)
Savings Passbook	-0.905** (0.421)	0.139 (0.548)	-0.512 (0.771)
Total Debt	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Average Interest	0.344 (1.711)	1.115 (5.474)	17.760* (2.801)

4.2 Methodology:

As with any methodology, randomized controlled trials have their strengths and weaknesses, both theoretically and empirically, and we must bear in mind some important caveats when interpreting our econometric results.

Data Challenges

Because this was a pilot program, the sample size of 300 households was relatively small. In our analysis, few results achieved statistical significance, and so we were not able to confidently report precise results. In some cases, verifying that the sign of the coefficients matched our expectations seemed the clearest way to check our model specification.

In addition, as with almost any data set, there were cases where survey data was ambiguous, or did not provide crisp proxies for the unobservables we were trying to quantify. In several questions, such as the ones regarding land contract type, households answered “other” a significant portion of the time. Subsequent versions of the survey could incorporate different categories into these types of questions, in order to capture the nature of these unspecified practices. In other situations, more questions might need to be added to the survey to capture further information on specific topics such as hidden loan fees and payment in kind.

Heterogeneity

Survey measurement issues can easily be changed over time, while some inherent shortcomings of the RCT model might be more permanent. This impact analysis measures the Local Average Treatment Effect (LATE) of this pilot loan program, and this effect may or may not conform to some or all of the parameters of interest. The LATE cannot separate out the impact of the program itself from the impacts of a variety of unknown factors specific to the communities surveyed, for instance, so we cannot presuppose that we would discover the same impacts if we conducted the pilot in other villages. The LATE also cannot easily account for the distribution of effects among the population. In short, this measurement is very good at giving precise estimates of impacts, but much less good at decomposing these effects.

Lack of Structural Model

Understanding *if* a program works or not is often much less important than understanding *why* it works. Economists have long used structural models to explain economic phenomenon based on recognized economic relationships. More recently, others have argued that these models have been largely ineffective at modeling economic impacts, especially in the developing world. In some senses, RCTs are able to make impact estimates with relatively few assumptions, yet the researchers’ implicit or explicit beliefs among the mechanisms working in any given situation still drive the processes of data collection and analysis. As Deaton writes in his seminal critique of field experiment methodology: “the demand that experiments be theory-driven is, of course, no guarantee of success, though the lack of it is close to a guarantee of failure.” (Deaton 2010, 450).

In this pilot, we were fortunate to work with researchers that had an intimate local knowledge of these two districts, and their assistance helped us specify and interpret our models. Without them, or without other clear theoretical guidance on how to econometrically represent these relationships, our results could easily be biased by specification errors. Even when we do find surprising average treatment effects, we can only give our best guesses on the mechanisms operating behind the scenes. Often, we base this assertion on the anecdotal models we formed in our brief qualitative research.

External Validity

While the results from this pilot are certainly promising, they can only be applied with great caution to other contexts. The LATE describes amalgamated effects specific to a place, time, and population. The qualitative survey, although limited, is able to expand upon these results considerably. The most important contributions of this pilot, however, are not a finalized set of results, but rather a call for innovation, scaling-up, and replication.

This pilot also illustrates some of the other, characteristics of a randomized controlled experiment that are extolled in Banerjee and Duflo (2008). The researchers were able to create an innovative program, forge ongoing and transformative relationships with non-profit partners on the ground, and exercise “creativity in measurement.” The results are presented in order to contribute to a current policy debate, and to further develop best practices in the field of agricultural lending.

4.3 Impact of Loans to Output Variables:

In this research we use transaction data obtained from household survey. The data is divided into two cycles, which we call Cycle 2 and Cycle 3⁷⁶. Cycle 2 mostly consist of output data from the month of March, April and early May 2010 while Cycle 3 mostly consist of output data from end of May, June and July 2010. Our crop of interest is potato from different varieties. Almost all of the crops being harvested in Cycle 2 are potatoes which can be sold directly or stored. Potatoes being stored in Cycle 2 can be sold in Cycle 3.

⁷⁶ The baseline data such including household characteristics was obtained in Cycle 1. Cycle 2 and Cycle 3 was concerning the farming output data.

For measuring impact on production and storage we will only use Cycle 2 data (168 observations) because in Cycle 3 most of the crops were vegetables therefore almost no storage activity incurred. There are four varieties of potatoes that we will use namely *Jyoti*, *Chandramukhi*, *K22* and *Pokhraj*.

For measuring impact on price we will use Cycle 2 (180 observations) and Cycle 3 (26 observations) data. We will only use two varieties of potatoes, which are *Jyoti* and *Chandramukhi*, because the market price data that we will use in the regression as one of the explanatory variable was not available for other varieties of potatoes.

$$Y_n = \sum_{i=1}^I \alpha_i X_{i,n} + \sum_{j=1}^J \beta_j Z_{j,n} + \sum_{k=1}^K \theta_k L_{k,n} + \sum_{m=1}^M \gamma_m V_{m,n} + \sum_{p=1}^P \varphi_p G_{p,n} + \sum_{s=1}^S \varphi_s R_{s,n} + \delta_n D_n + u_{y,n}$$

To measure the impact, our strategy is to compare the output variables of the treatment group which are the farmers who are being recommended or are in a group and ended up getting the loan (X) with the control group, farmers who are being recommended or being in a group but not getting the loan (Z). By looking at the difference between these two groups, we can measure the impact of the loan.

In our analysis we will control for different characteristics of farmers based on the size of the land owned (L).⁷⁷ We will also include dummy variables for village (V)⁷⁸, varieties (G) and cycle (R) to control for the fixed effects. Lastly, the term (D) are referring to continuous variables including cultivated area (for production & storage impact model), costs of storage (for storage impact model), and crop quantity & market price (for price impact model).

⁷⁷ “Landless” defined as own no land, “Marginal” defined as own less than 1 acre and “Small” defined as own between 1 and 2.5 acre of land.

⁷⁸ There are six villages from which 2 villages being assigned to different types of loan. TRAIL villages are Gazipur and Nachanjam. GRAIL villages are Kharikasuli and Sahapur. GBL villages are Naraharipur and Hara.

Table 15 - Summary Statistics

Variables	Average			
	Transaction Price	Ground qty (%)	Home qty (%)	Cold qty (%)
TRAIL				
recommended - get the loan	2.37 (0.49)	57.06 (14.05)	15.79 (10.34)	14.59 (7.07)
recommended - not get loan	2.12 (0.20)	43.62 (8.39)	24.82 (6.28)	16.04 (5.38)
not recommended	2.25 (0.21)	35.22 (6.86)	35.22 (6.86)	22.63 -5.32
GRAIL				
recommended - get the loan	1.88 (0.14)	62.27 (10.61)	18.16 (8.59)	8.23 (4.59)
recommended - not get loan	1.91 (0.07)	63.6 (7.54)	20.11 (6.18)	7.239 (2.77)
not recommended	2.03 (0.10)	61.16 (6.45)	61.16 (6.45)	12.08 (3.71)
GBL				
recommended - get the loan	1.74 (0.10)	66.79 (10.09)	4.68 (2.23)	19.88 (9.30)
recommended - not get loan	1.78 (0.13)	58.25 (6.91)	11.64 (3.89)	20.43 (5.91)
not recommended	1.88 (0.09)	66.4 (4.94)	66.4 (4.94)	17.48 (4.28)

Standard errors in parentheses

The major difficulty is that since the data is obtained from pilot project, the number of sample in the treatment group might not be sufficient. Considering this, it is necessary to put emphasis in our qualitative analysis, which is obtained by field team, to have a complete picture of the situation. The qualitative analysis will confirm the regression result.

From the data (Table 15), we found that there are differences in the average value of output variables from different types of loan.

TRAIL farmers who were being recommended, in average, get lower price than their counterpart who were not recommended. But, once they receive the loan they get higher price off-setting the lower price from being recommended. TRAIL farmers who receive the loan also, in average, sells more crops from the field and store less compared to those who are being

recommended but not getting the loan and those who are not recommended. We will revisit this issue in the regression analysis.

GRAIL and GBL loans shows different data pattern compared to TRAIL. GRAIL farmers who received the loan, in average, gets lower price than those who are being recommended but no getting the loan and those who are recommended. But, GRAIL farmers who received loans, in average, sells less from the field and put more in the storage compared to those who are recommended but not receiving the loan. On the other hand, we can also see that farmers who were not recommended gets, in average, higher price and store substantially higher proportion of the crops in their home compared to the other two groups. It is possible that the agent tend to recommend farmers who are poorer and do not have storage facilities at their home. This phenomenon also applies to GBL loans.

4.4 Impact on Production & Storage:

We want to see whether the different types of loans have different impact on production and storage. Table 16 presents our regression result. The first column reports ordinary least square estimates of the impact of loan to yield. We found no impact of different types of loan. We have expected this result because the amount of the loan is not big enough to have any effect on production. It is possible to track the impact of the loan to other variables such as input expenditure (for example, fertilizer), but the data is not sufficient. This is understandable since farmers seldom keep track of the expenditures. On the other hand, we found a significant correlation between production and land class. Farmers who are categorized as owning “small” land (between 1 and 2 acre) are much more productive than farmers who owned marginal land (less than 1 acre) or landless farmers.

The rest of the column in Table 16 shows the proportion of harvest being sold from the field and being stored in home or in cold storage. We want to see whether different kinds of loans impact the timing of the sale. If the loans have effects on improving farmers’ cash flow, then he/she will have less pressure to sell the crop from the field (with low price), and instead, choose to store it while waiting for better price.

Table 16 - Impact on Production & Storage

VARIABLES	Harvest	Ground sale pct.	Home storage pct.	Cold Storage pct.
TRAIL				
recommended - get the loan	59.16 (689.00)	28.76** (11.70)	0.59 (10.36)	-17.79** (8.49)
recommended - did not get the loan	-464.02 (649.67)	8.58 (11.03)	-8.5 (9.72)	13.43 (8.29)
GRAIL				
recommended - get the loan	-745.9 (639.77)	-0.19 (10.86)	13.37 (9.37)	-8.08 (8.00)
recommended - did not get the loan	339.89 (565.08)	12.25 (9.60)	-1.37 (8.34)	-11.5 (7.04)
GBL				
in group - get the loan	-28.1 (650.16)	-2.06 (11.04)	4.94 (9.50)	-6.54 (8.01)
in group - did not get the loan	389.93 (429.77)	-9.23 (7.30)	-3.03 (6.27)	9.17* (5.29)
Land Class				
Marginal	684.00** (318.92)	11.08** (5.42)	7.01 (4.67)	-12.83*** (3.96)
Small	3,953.61*** (748.84)	-2.43 (12.72)	2.17 (10.94)	-5.94 (9.32)
Cultivated area	6,102.52*** (373.85)	10.71* (6.35)	-19.47*** (5.77)	-14.81*** (4.68)
Storage Costs				
Home			0.13*** (0.02)	
Cold Storage				0.08*** (0.01)
Village Dummies				
Sahapur – Hugli	610.02 (814.25)	0.29 (13.83)	15.7 (11.96)	17.76* (10.29)
Naraharipur – Mendipur	2,301.99*** (684.98)	67.46*** (11.63)	-19.22* (10.04)	2.46 (9.08)
Nachanjam – Mendipur	-635.86 (751.39)	53.77*** (12.76)	-5.35 (11.02)	-1.79 (9.74)
Kharikasuli – Mendipur	1031.89 (712.09)	42.88*** (12.09)	-17.48* (10.56)	17.12* (9.49)
Hara – Hugli	(73.01) (670.52)	21.02* (11.39)	9.48 (9.79)	13.58 (8.86)
Variety				
Jyoti	306.11 (429.73)	14.16* (7.3)	1.18 (6.43)	(2.98) (5.31)
K22	75.01 (936.65)	15.78 (15.91)	10.41 (13.75)	(11.00) (11.56)
Pokhraj	162.39 (781.97)	51.43*** (13.28)	-8.84 (11.69)	-17.84* (9.71)
Constant	-405.83 (705.84)	-12.6 (11.99)	26.50** (10.36)	18.17* (9.48)
Observations	168	168	166	166
R-squared	0.81	0.55	0.47	0.58
Pair Test P> t 				
TRAIL				
Impact of the loan = 0	0.6375	0.2852	0.5899	0.026
GRAIL				
Impact of the loan = 0	0.2945	0.4788	0.331	0.7899
GBL				
Impact of the loan = 0	0.6419	0.6386	0.5437	0.1571
Impact TRAIL = Impact GRAIL	0.2851	0.2023	0.8	0.664
Impact TRAIL = Impact GBL	0.5017	0.5844	0.9577	0.3737
Impact GRAIL = GBL	0.6288	0.4035	0.7377	0.2636

Standard errors in parentheses

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

Our result shows that farmers who received TRAIL loans sell more crops from the field and store less. On average, TRAIL farmers who received loan sells 28% more from the ground and stores 17% less in the cold storage compared to TRAIL farmers who did not get the loan. This tendency to sell more from the field is because TRAIL farmers who received the loans gets a higher price compared to TRAIL farmers who did not get the loan. The impact of TRAIL loans to transaction price will be explained in the next section. However, we detect no impact from other types of loans.

We found that land class has strong correlation with field sales and storage proportion. “Marginal” farmers sell more crops from the field and store less, even compared to the “Landless” farmers. This can happen because there is arrangement between “Landless” farmers and the owner of the land to share crops. Crops that belong to a land owner might be stored for future sale. In average, “Marginal” farmers sell 11% more from the fields compared to “Landless” farmers and 13% more compared to “Small” farmers. Our results also show that “Marginal” farmers stored almost 12% less in the cold storage facilities.

In this regression, we included “Cultivated area” as an explanatory variable. It is different from the “Land class” variable since the area being cultivated does not necessarily mean that it is owned. On the other hand, land which is being owned does not necessarily imply that it is being cultivated. Our result shows that cultivated area has positive correlation with production, which is as expected. In average, farmers who cultivate larger area are more productive. At the same time, they also sell more from the field and store less. This is because larger scale farmers have less pressure to wait for the higher price since they can get sufficient revenue by selling more from the field.

The regression result also shows that the costs of storage whether home or cold storage have negative correlation with the field sales and storage proportion, which is as expected.⁷⁹

⁷⁹ Costs of storage include transportation and handling costs.

4.5 Impact on Price:

We want to see whether different types of loans have different impact on the transaction price. Table 17 reports our regression result using transaction price as dependent variable.

From the regression, we found a visible impact only in TRAIL loans. On average, farmers who are being recommended for TRAIL get a lower price. It is possible that recommended farmers are the “captive” of local traders, but we do not have sufficient quantitative data to establish the relationship between farmer and traders to back this statement. Farmers who are being recommended on average get a lower price by 0.3 rupee per kilogram of potato. On the other hand, we found an, interesting result regarding the impact of TRAIL loans, which are off-setting this lower price. Farmers who are recommended for TRAIL loans ended up receiving a higher price by 0.3 rupee.

TRAIL agents consist of all kinds of traders. They can be traders that do not buy crops from farmers. However, since they usually have better knowledge of the market (and price) than farmers, they can give a recommendation to farmers about who to sell the crops to in order to get higher price. TRAIL agents may have an interest in the farmers’ repayment since their commission is based on it. This might be the reason why farmers who received TRAIL loans can get higher price. Additionally, we found that no impact on price for GRAIL and GBL loans.

In this regression, we also found significant correlation between field sales and transaction price. Fields sales, in average, get a lower price by 1.24 rupee compared to sales at later date. From our regression, we also found that the transaction price moved in symmetry with market price, shown by the unitary coefficient of market price.

It is interesting to look at the relation between transaction price and type of the buyer. From our data, we can see an indication that farmers who sell their crops to local traders get lower prices compared to selling to traders from outside. Farmers can get even higher price if they sell the crops directly in the market. Yet, there are costs considerations. Selling the crops from the field to local trader usually does not involve transportation and handling costs for the farmers, while selling to traders from outside the village or directly to the market might involve such costs. Our difficulty is that there is no sufficient data on these costs. So, we could not include the type of buyer variable in our regression.

4.6 Summary:

From our data, we could not find the impact of the different types of loans to production. From the storage side, TRAIL loan has an impact. Farmers who received TRAIL loans tend to sell more from the field and store less. This is because they get better price for field sales. We could not find impact on storage from other types of loans.

The only visible impact of loans to price is also from the TRAIL loans. Our regression result shows that recommended farmers for TRAIL loans on average get a lower price. There seems to be a “captive” relationship between agents and recommended farmers. On the other hand, TRAIL farmers who ended up receiving the loan get higher price which off-setting the price impact of being recommended. The loan receiver get higher price because TRAIL agents give recommendation to these farmers regarding the method and place of sale which resulted in higher price. This is because the agents have interest in the repayment rate of the loans and gets commission from it. We do not detect impact on price for GRAIL and GBL loans.

Table 17 - Impact on Transaction Price

VARIABLES	Potato Transaction Price
TRAIL	
recommended - get the loan	0.30 (0.23)
recommended - did not get the loan	-0.36 (0.23)
GRAIL	
recommended - get the loan	-0.07 (0.31)
recommended - did not get the loan	-0.17 (0.22)
GBL	
in group - get the loan	-0.06 (0.34)
in group - did not get the loan	0.04 (0.22)
Land Class	
Marginal	-0.23 (0.18)
Small	-0.26 (0.26)
Crop quantity	0.00 0.00
Field Sales	-1.24*** (0.26)
Market Price	1.00*** (0.12)
Village Dummies	
Sahapur – Hugli	-0.28 (0.28)
Naraharipur – Mendipur	-0.09 (0.30)
Nachanjam – Mendipur	0.20 (0.22)

Kharikasuli – Mendipur	0.02 (0.29)
Hara – Hugli	-0.07 (0.26)
Variety dummy (Potato - Jyoti)	0.21 (0.28)
Constant	-0.21 (0.63)
Observations	206
R-squared	0.54
Pair Test	
TRAIL	
Impact of the loan = 0	0.09
GRAIL	
Impact of the loan = 0	0.82
GBL	
Impact of the loan = 0	0.83
Impact TRAIL = Impact GRAIL	0.34
Impact TRAIL = Impact GBL	0.22
Impact GRAIL = GBL	0.76
Standard errors in parentheses	
*** p<0.01, ** p<0.05, * p<0.1	

5. *Qualitative Analysis – The Design and Implementation:*

The econometric evidence paints an extremely vivid picture about the impacts of this microfinance intervention. As the previous section indicates, access to these loans do not seem to impact the productivity of the farmers. In terms of prices, recommended TRAIL farmers tend to get lower prices, whereas farmers in the TRAIL villages that receive a loan obtain higher prices for their potato crops. TRAIL farmers who receive the loans are also more likely to sell crops from the ground and store less. Overall, farmers who sell to local traders receive lower prices compared to those who sell to outside traders. Finally, farmers who put items in storage or delay the sale of their crops receive higher prices.

When looking for bias in the recommendations, the econometric evidence offers an interesting analysis. For GRAIL villages, landless households that own less land are more likely to be recommended. In TRAIL villages, households with savings passbooks are more likely to be recommended. In GBL villages, poorer households are more likely to seek a loan. Additionally, those with higher than average interest rates are more likely to form a group and seek a loan.

While the econometric evidence offers evidence that shows what the impacts of the intervention are, it does not explain how or why these impacts are happening. To answer these questions, and hopefully fill the gaps in the overall analysis, the research team designed a

qualitative survey. The survey was implemented over five days in November with the help of the research team in West Bengal. Originally, the team wanted to design a survey with close-ended questions that could then be coded and analyzed as a compliment to the econometric analysis. Ideally, this survey would have been given to enough actors in the intervention to allow for a representative sample of the main actors. However, due to time constraints this type of analysis was not possible. Therefore, the research design changed to incorporate a more descriptive, journalistic type of survey. Instead of interviewing a representative sample, the team picked certain actors (farmers, TRAIL and GRAIL agents, and control groups) to try to ascertain the benefits and challenges of this program.

With this said, it is important to note that any of the theories presented below are merely conjectures that cannot be taken as absolute fact. However, the researchers of this paper believe that the econometric analysis in conjunction with the qualitative surveys offer enough evidence to back the plausibility of these claims. As will be discussed in the final section of this paper, these hypotheses may be useful to help guide future surveys and analyses.

One of the main purposes of the study is to measure the impact of the intervention. We see the numbers from the econometric analysis, but we wanted to hear specifically from the clients who are supposedly being helped by this intervention. In this sense, we wanted to know whether the clients think the loan had an impact both in terms of productivity, providing inputs, purchasing cold storage, and perhaps also in terms of helping smooth consumption and helping with other household debts. Also, what do the clients think about the different features like insurance, dynamic incentives, and agent based monitoring?

Another aspect of the study that is being analyzed is the motives and incentives. On the agent side, we wanted to know why they agreed to get involved? Was it politically, socially, or profit motivated? Furthermore, what are the agents getting out of being part of this program? Are they participating fully, or are they “outsourcing” a portion of their work to someone else? Do they have other businesses or priorities that keep them from being fully engaged? In terms of clients, we wanted to understand why they agreed to take the loans? Did they view it as essential to improve their productivity, or did they take it simply because it was being offered?

Finally, we wanted to better understand the relationship between the agents and the clients. The goal of this portion of the qualitative survey was to see if there was any selection bias on the part of the agent. Did they recommend people who they knew could repay, or are family members and friends given priority? Additionally, we were interested in how the relationship plays out between the borrowers and the agents. Specifically, does this loan create exploitation between the agent and farmer? Does the farmer feel obligated to work with the agent? It is certainly important to keep in mind the possibility of exploitation, especially in light of the recent developments in Andhra Pradesh. If there is evidence of exploitation, then it may become difficult to market this product to MFIs in India based on the current hostility towards MFIs that are seen as exploitative.

The remainder of this section will be devoted to understanding the impacts, motives, and relationships addressed above. When ever possible, the qualitative analysis will bring in the econometric conclusions to create a story that explains the dynamics within this credit intervention. Specific quotes from the survey can be found in Appendix 7.

5.1 Are the Farmers Benefiting from these Loans?

In general, the farmers are benefiting. However, it is important to understand and define what “benefiting” actually means in this context. First, small and landless farmers are able to receive credit without collateral. Based on our interviews, many of the smaller farmers had never been able to procure a loan before. By these standards, extending credit to the “un-bankable” poor is a huge benefit for these farmers.

The question remains, however, are there benefits beyond simply extending credit? Although extending credit is a social good within itself, we would define “benefiting” as a combination of increasing productivity by investing in more inputs and more advanced technology, being in a position to be better able to negotiate prices with traders, and using cold storage more often to receive better prices for their harvest. Many used the loan to buy seeds, fertilizer, pesticides, and other inputs, while others invested in irrigation systems. However, these investments were fairly minimal, according to the interviewees.

From the interviews, it appears that the impact of the credit differs between groups. In terms of access to credit, the landless farmers tend to benefit the most because they had

previously been unable to get loans from other formal sources. Many previously received informal credit from the owners of the land, moneylenders, or traders, but this was the first formal loan they had ever received. While small and landless farmers benefit greatly from simply receiving access to credit, medium and large farmers view this loan as another source of income. Most medium and large farmers admit that they have multiple loans from multiple sources, and thus, have diversified their credit needs with this loan.

In terms of utilizing cold storage, the pattern of the interviews suggests that those who were already using cold storage would continue to do so. However, those who were not previously utilizing cold storage viewed it as too risky before the loan, and continued to view it as risky even with the loan. As a result, farmers were not likely to start using cold storage if they received a loan. One of the hopes of the loan was that farmers would be able to use cold storage more to receive better prices. Yet, our interviews suggest that this is not necessarily the case.

This evidence aligns with the econometric evidence, which shows that farmers did not significantly increase their productivity during the pilot period. This might have more to do with the amount of the loan and the fact that the loan was distributed after the planting decisions had already been made. In fact, a large portion of the farmers that we interviewed that took the loan mentioned that the amount of the loan was simply not large enough to have a noticeable impact.

Therefore, it is difficult to ascertain whether or not the farmers are benefiting from these loans. With such a small amount of money extended as credit, it is unlikely to see a sizeable increase in benefits. Moreover, many of the impacts that we would expect to see may not be visible in such a short time frame. For example, if a farmer invested in a more advanced (or any) irrigation system, you may not see a significant increase in yield for that year (depending on when they put the system in and how effective it is). It will be interesting to see if productivity increases during the second phase with loans being given before planting season begins.

5.2 What is the Role of the TRAIL Agent in this Intervention?

Although these agents are no longer making money off of interest by extending loans to farmers, it does appear that they are benefiting in other ways. Obviously, they receive a commission for taking part in the program. Beyond the commission, it appears that they have gotten involved in the program because they no longer have to take the risk of loaning to the

poor. They tend to view the long-term success of the program as a means to increase both their clientele and profits.

Beyond taking on less risk, we were curious to better understand why these agents decided to get involved in the program? In the interviews, the TRAIL agent that we interviewed claims that he likes to feel as if he is doing a social good, which sounds good on the surface; however, further questioning suggests that his motives are clearly more profit driven. Furthermore, he enjoys the social prestige, which he earns by being the point person for the scheme. The TRAIL agent in Medinipur highlighted this point when he said, “Getting involved with this project has helped me deepen my social relations, above and beyond my business clientele relation.”

Our interview suggests that there are other more profit oriented motives at play. First, when farmers have more money (in this case because of the loan), they have the ability to buy more inputs. The TRAIL agent that we interviewed owns a shop that sells these inputs, and it seems as if his clients that receive loans feel indebted to him, and thus, buy almost exclusively from his shop. This means he might be able to create a sort of monopoly in the village. Our research also suggests that this might be occurring within this village.

Many of the farmers claim that the trader tells them a price, and they pay it because they trust the trader. Pradip Karmakar, a small farmer in Nachanjam, told us, “I have known Tapan Nayak [TRAIL agent] for a very long time. When he informed me about the opportunity to receive a loan, I agreed to participate.” Even though the prices are written on most products, the trader dictates a price and most of the clients will pay it without question. Therefore, even if the clients can now pay in cash, they might not receive a “savings” by not buying on credit if the traders can dictate monopolistic prices. This process begins to reveal the profit driven motive of this trader. The TRAIL agent did proudly boast that farmers seek his advice for what seeds to buy, when to use fertilizer, what are the best prices, etc. He views his role as multifaceted within this process. Again, this role might empower him to suggest more expensive inputs or more excessive inputs than are needed. In other words, if he eventually increases his clientele as the program expands, he will be able to sell more inputs to more people who will feel obligated to purchase solely from him.

Second, there is a possibility that TRAIL agents will benefit on the marketing side. The TRAIL agent that we interviewed stated that he did not personally take part in the marketing of the crops. Unfortunately, we were unable to interview the second TRAIL agent in Hooghly, but we were told that he does take part in the marketing the crops. Our interviews suggest that medium and large farmers tend to have a better negotiating stance; therefore, they are more likely to receive a fair price for their crops from traders. However, small or landless farmers do not appear to have this same capacity to negotiate. Theoretically, a TRAIL agent that is involved in the marketing side might be able to suggest a much lower price for the potatoes than the farmers should actually get.

At first glance, the econometric evidence appears to contradict the statement that farmers feel obligated to the TRAIL agent, and so, receive lower prices. In fact, the econometric evidence shows that farmers who received loans in TRAIL villages receive higher prices for their crops. Based on our interviews, we believe that this does in fact fit within our profit motive theory if for example TRAIL agents were giving higher prices to clients with loans to ensure that the loans could be paid back. If TRAIL agents intend to expand the program to increase potential economic benefits, then they probably realize that the program needs to be successful (i.e. repayment rates need to be high). This is one possible theory that will need to be tested in more detail once the second phase of the intervention is complete.

In sum, the TRAIL agents' motives appear to be profit driven in nature. More importantly, this evidence suggests that they benefit the most from the scheme. The costs for TRAIL agents are more time spent monitoring clients, less money taken in from previous lending schemes (if they lent money at all), and a potential loss of business from those not recommended who blame the agent for not being chosen. However, the benefits appear to outweigh the costs for these agents. The benefits, as suggested above, are increased profits due to commission and potential interlocking with other businesses, less risk by loaning less to farmers, improved social image within the community, and the ability to align farmers decisions with the TRAIL agents desired outcomes.

5.3 *What is the Role of the GRAIL Agent in this Intervention?*

The incentives for the GRAIL agents are considerably different from TRAIL agents. First, the incentives seem to be socially motivated. Furthermore, this social motivation is inevitably intertwined with political motives. As Biswajeet Das, the GRAIL proxy in Hooghly said, “The main ideal of our political party is to do good, and I see this as a chance to serve the poor.” It is important to note that even though they are not profit driven like the TRAIL agents, GRAIL agents still receive compensation through the commission mechanism. Interestingly, the first GRAIL agent specifically asked us not to mention this to his assistant or any of the clients. The second GRAIL agent claims that he had never (and will never) take compensation for doing a social good. Although this does not necessarily mean that the GRAIL agents are profit drive, they do receive a small fee for their socially driven motivations.

The recommendations by GRAIL agents likely support the claim that they see the loan as a social development tool. Banshi Mallik, the GRAIL agent in Kharikasuli, elucidates this point when he said, “I want to help people progress. This is an apt opportunity; I am doing good and lending a helping hand.” Interestingly, both GRAIL agents admitted that the GP is the one who actually recommends the clients. The GRAIL agents simply implement the GP’s decision. Furthermore, a majority of the farmers recommended by the GRAIL agents appear to be the smaller and landless farmers as evidenced by the fact that a majority of those who we interviewed fit within this category. This suggests that they feel that these are the most needy, and that the loan will have some sort of positive impact. The fact that the GRAIL agents recommend the poorer farmers may explain why the take up rate is significantly lower in these villages (i.e. the landless, small farmers suggested that the loan size was too great and too risky, so they turned it down).

From our interviews, we believe that the recommendation process in the GRAIL program are based on 3 criteria:

- 1) Political loyalty
- 2) Poor, landless, or most needy farmers
- 3) Ability to repay

The reason we added the ability to repay as one of the criteria is because the GRAIL agents in both villages want to rapidly expand the program to help garner more support while also helping the needy. Based on our conversations, it seems as if they recommended people who had a proven track record of repayment with other sources (mainly informal sources). If the program is a wild success, then it is much easier to make a case to expand it rapidly. Of course, we cannot prove this point, but it was an interesting observation based on our interviews.

As previously mentioned, the GRAIL agents both said that they would rather expand the program rapidly rather than extend larger loans to the existing clients. Nityananda Das told us in our interview that, “You should scale up this lending scheme. There is a lot of demand for credit in this format.” This suggests that they view the program as a social development program that should be a public good for the poorest farmers. For example, the second GRAIL agent emphasized that he promoted the program as a food program that will solve the food insecurity issues within the village so no one would go hungry.

According to the GRAIL agents that we interviewed, they do not take part in advising clients on farming techniques or what inputs to purchase. They also do not take part in the marketing of potatoes. The farmers in the villages confirmed that this is true. In fact, the farmers explained that they would rather meet with other farmers or cooperatives for technical advice. This also points to the theory that these agents view this as a social program and do not try to extract extra rents out of the clients. Moreover, the econometric analysis shows that farmers in GRAIL villages do not receive higher prices for their crops, which makes sense in light of the evidence that GRAIL agents are not active in the advising the clients on prices for inputs and sales.

In the TRAIL program, the interlocking system suggests that there is clearly some sort of exploitation or trade off that benefits the traders. Even though the GRAIL agents are not profit driven, there could also be trade offs that benefit the agents. In this program, the exploitation appears to be politically based. Although the farmers were hesitant to admit it, it is plausible that the GRAIL agents expect political loyalty in exchange for these loans. However, the question remains: if they are recommending the poorest, landless farmers more than perhaps the trade off is not so extreme in the sense that the farmers benefit greatly from receiving access to credit. Plus, they might already support the party anyway, so this would not be a great burden.

Furthermore, utilizing a government official gives the program an automatic stamp of approval, which might make it easier to earn the trust of the clients. Of course, context matters so this may not always be the case. Also, going through a government agent may help an MFI during times where the government becomes hostile to finance programs (as historically has happened within India, and is happening today with the news in Andhra Pradesh). Furthermore, one could argue that all finance is political and the government could step in at any moment to reign in what they see as exploitative behavior. So, aligning with a political organization may alleviate some of these issues should they arise, or at least provide a preferential environment for the MFI.

The problem becomes if the GRAIL agents withhold extending loans to certain qualified clients because they do not fall in line politically. Additionally, there is a risk that aligning with a political organization may put an MFI at unnecessary risk if say the official decides he is going to suddenly forgive debts to garner more political support during elections. There is evidence of this happening in India, and if the GRAIL agent, for example, feels that his first duty is to help the poor then he may put the client's needs over the needs of the MFI.

As this analysis suggests, there are considerable benefits for a GRAIL agent in this program. Beyond receiving a small commission, taking part in this program allows these agents to promote their political party's social development objectives. This gives the GRAIL agents greater political interlocking as a result of the loan, and it also helps to improve the social image of the GRAIL agent.

5.4 Summary of Qualitative Analysis:

Even though the qualitative survey is not sufficiently representative, it does bring up many interesting questions that could possibly be addressed in the current phase of the project. First, the qualitative survey suggests that beyond access to credit, the loans are not having a significant impact on the livelihoods of the farmers. This might be because the pilot period is too short, or perhaps because the loans were disbursed after planting decisions had been made. In either case, it is important to know whether or not these loans are impacting the farmers in other ways. As discussed below, perhaps these loans are having an impact on consumption, which significantly helps the household, but we just do not know. If the goal of these loans is to

increase access for farmers, then it appears to be a wild success. If, however, the goal is to make the farmers “better off” then more research needs to be done.

Second, the qualitative portion of our research indicates that the TRAIL agents benefit quite a bit from this scheme. Of course, we cannot be sure of this fact, but in talking to the farmers we believe that there is a significant interlocking between the TRAIL agents’ who own different businesses and the farmers who received the loans. In this sense, we believe that at least economically, the TRAIL agents benefit the most.

Third, it appears as if the GRAIL agent model might be the best model for promoting a scheme that focuses on making the small-farmer better off. Because the GRAIL agents promoted this program as a social development tool, it seems as if they have an incentive (i.e. political loyalty) to help their clients receive access to the loans. Of course, it does not appear that the loans are having a significant impact on the GRAIL side, but this might mean that the GRAIL model also needs an information intervention, or perhaps there needs to be some sort of program that connects the farmers to agents who will give them preferential pricing. Although this was not part of the pilot phase, we are curious to see how the information intervention aids the farmers on the GRAIL side of this intervention.

A full qualitative survey needs to be done once the second phase of the program has been underway. In this survey, we suggest focusing on the agents, and creating an agent survey that tries to go into more depth about the questions we pose. Of course, part of this survey will be asking the farmers about their relationship with the agent. In the end, we believe that the agents hold the key to the success of this program, which means that their involvement needs to be studied further.

6. *Final Recommendations:*

This pilot project involved two main activities. The first is giving and administering the loan, and the second is conducting household survey to measure the impact of the loan. However, in some aspects the two activities do not seem to be integrated. While the loan aspects are specific and unique, the household survey tends to be general and broad.

There are specific features of these loans that should be specifically addressed in the questionnaires so that its impact can be effectively measured. These features include the dynamic incentive, window of repayment, and insurance which according to our qualitative survey is one of the important aspects that influence the take up of the loan. Other concern is that the loan might be used for consumption purposes since there is no restriction on the usage. If this is the case, then it will be difficult to measure the impact because the survey focuses on the agricultural production. We recommend that the survey for the full-scale projects incorporate these aspects into the questionnaires.

As have been mentioned before, our main difficulty in this research is the limited observations from the treatment group. Based on the survey design there should be ten observations of the treatment group from each village, which make the total of sixty observations from six villages. Then, each type of loan should have 20 observations. However, what we find in the data is much less than that number. On the other hand, we have more than sufficient amount of observations for the control group. For the full scale project, we recommend that the household survey should try as far as possible to put more emphasis on the treatment group to ensure the observations will be more balanced between treatment and control group.

In compiling the data we found more difficulties. There is no unique identity number for each household in the observations. There are duplications of household identity between villages. It will be easier for compilation if each household was assigned one unique identity number. Moreover, each individual household data is recorded in one Excel files using separate worksheet for each block of questions with the household identity data only being entered in the first worksheet. This, in turn, makes compilation difficult and time consuming. It can be more efficient if the survey data is being entered into database management system even the simplest one such as Microsoft Access. This will greatly saves time and increase the flexibility of data manipulation.

There are loan related data in the questionnaires but we found difficulty identifying whether the loan is coming from this project or from another source. We found inconsistencies for example in the recording of the variety, which often uses different names for essentially the same crops. We also found same household being recorded with different names in loan data and survey data. In addition, data on agriculture expenditure, transportation and handling costs are

mostly left blank, and so, we have difficulties in determining whether such expenditure/costs has not occurred or it was occurring but had not been recorded.

6.1 How Important is the Exchange of Information?

Based on our analysis, it seems like the loans have not helped increase bargaining power between the farmers and traders – especially for the small farmers. For many small farmers, they blindly trust that the trader is giving them a fair price because they have a prior relationship with him. As a result, a farmer that has always done business with a particular trader will probably never question the price that the trader gives him for purchasing inputs or selling his crops. As the farmer who showed us the fertilizer bag mentioned, the price is right there on the bag, but most people do not realize that. This suggests that even a deep relationship with a trader will not necessarily keep the trader from dictating higher prices. Although some farmers stated that they are now buying inputs in cash, it may not be a savings as initially hoped by the research team. Other farmers mentioned that they would be willing to sell their products at a lower price to a trader that they knew and trusted because they are afraid to be cheated. Again, as our qualitative study indicates, these farmers are very risk averse.

In light of this evidence, we believe that the lack of information is rather debilitating for these farmers. Therefore, we believe that a multifaceted informational intervention needs to be added as a component of any agricultural microfinance scheme. We suggest a multifaceted scheme because this exchange of information needs to extend beyond just the prices of potatoes to add the fair price for other inputs such as fertilizers and pesticides. Purchasing and selling potatoes are only one part of the multiple agricultural transactions that farmers undertake on a daily basis. It would be unwise to focus solely on one aspect at the expense of others.

A multifaceted approach to information can become very complicated, but as we learned in our time in West Bengal, there are several farmer co-ops in each village. Perhaps these could serve as a meeting point to collect and disseminate information on prices. These are well-established organizations with deep ties to the community, and these co-ops are already a place where farmers come to share information.

Of course, it may not be in the interest of the MFI to actually set up this process. This is understandable due to the complex nature of these loans. However, this does not mean that the

MFI cannot facilitate this process by teaming up with a local NGO that can run the informational portion of this product design. We met with a wonderful NGO in Hooghly that is deeply committed to improving the livelihoods of the rural poor. This NGO would be an excellent candidate to run the informational sessions.

Knowledge is truly a power thing. Knowing the prices will allow farmers to question when traders ask for a higher price. This information could effectively help small farmers increase their bargaining power, perhaps save money by receiving fairer prices, and possibly end with a positive benefit overall. It will be interesting to see how the information portion of the next round of loans plays out; however, we hope that our suggestions will help build a stronger and more multifaceted approach to disseminating information.

6.2 Can an MFI Take Up this Model if it is Successful?

Although this is merely a conjecture, we worry that the standards set by this model are partially unattainable by the common MFI. First, with the interest rates set artificially low at 1.5% per month, it will be difficult for any MFI to extend the same rate. It is understandable why the rate was set this low (so farmer's would be willing to take up the loan in the first place); however, when an MFI take this program on will they have to raise the interest rates? And will this rise in interest rates deter farmers from taking the loans?

Second, MFIs may not be willing to take on the insurance aspect, which is a key component of this program. Insurance is a very complex program to provide, and it is worrisome that perhaps this experiment took on a very simplistic approach to insurance. In reality, insurance programs create a considerable amount of risk for an MFI. If they cross subsidize the insurance with money from other programs (like savings from a group), then they risk losing that group's money and facing a liquidity crunch. Many of MFIs buy insurance from other companies to partially cover the risk, but this means that they will have to pass the costs on to the client. If an MFI asks a farmer to provide a premium for insurance, will the farmer be willing to pay? The MFI could build this into the interest rate, but that means that it will be increased even more.

Finally, will this model convince MFIs to lend to agriculture? If an MFI takes this product on, they will probably tweak the program to fit their context. This might work, but it also might create challenges. There is really no way of knowing, but it is important to keep in mind

that the move from an academic experiment to a real world model is often complex and difficult as the context changes.

6.3 What Happens After the Experiment is Over?

As students of public policy, we are increasingly concerned about what happens once this experimental program is over. If the program is a success (which it appears will certainly be the case), what ensures that the clients receiving the loans will continue to receive the loans? There is evidence that Sri Sanchari is continuing the program, so it will be interesting to see how that plays out.

However, far too often it seems like these experiments happen and then the academics pack up, leave, write their articles, and move on to other projects. Of course, writing an academic paper that is widely read across different fields is a marketing tool in a sense, but is it enough? In the academic circle, this experiment will certainly receive a lot of attention, but how will MFIs know whether or not this type of program will work for them? These gaps between the experiment and policy are quite large, and unfortunately, it does not seem that there are very many proposals to fill these existing gaps. In other words, we do not believe that it is enough to be rigorous and thoughtful in designing and implementing the survey. Those who undertake these projects have an obligation to see that their experiments are implemented in the real world. Therefore, there must be the same amount of rigor and effort put into marketing the product.

This product has real world implications that go beyond a STATA model. Real people depend on these loans, and denying them the product because the experiment is over seems wrong. As previously mentioned, it is our opinion that those who take part in successful experiments have an obligation to see that they are taken up as policy or by organizations that can promote the products. If those who promote randomized controlled experiments see them as the perfect hybrid for the economic and development world, they need to understand that there is emphasis lacking on the policy side. As Esther Dufflo mentioned in her lecture at Boston University, they are beginning to do market the outcomes of certain experiments as policies at J-PAL. This is certainly a step in the right direction; however, we take this argument a step further.

We believe that promoting the outcomes of a randomized controlled experiment must be a standard part of each experiment. It might make sense to add an academic who works in public

policy who could oversee a separate academic team that comes in after the experiment to promote the product. Another option may be to hire some sort of consultant who would go to MFIs that are interested and help them set up a similar program. There are different options to ensure that these products are promoted in a sustainable manner.

7. Conclusion

In the end, we believe that this research has incredibly powerful implications. We want to see that those within the academic community and those who deal in public policy understand and promote its successes. As we mentioned in the beginning of the paper, bringing microfinance to rural farmers is important. Far too often, microfinance has ignored financing small farmers in order to remain profitable. This means that microfinance is failing to meet a critical objective in its double bottom line approach. To truly reach the poor, an MFI must find a way to lend to rural farmers. However, first an MFI must be convinced that lending to rural farmers is in their best interest before they expand into this new and risky sector. We believe that this experiment will ultimately prove that the rural poor are just as credit worthy as the urban poor.

Appendix 1 – Key Challenges by Variable

Key Challenges Affecting Rural Finance	
Category of Challenge	Constraints and Issues
<p>Vulnerability</p> <ul style="list-style-type: none"> • Systemic risk • Market risk • Credit/financial risk 	<ul style="list-style-type: none"> • Weather • Plagues, diseases • Prices • Production • Useable collateral • Demand preferences • Health and family needs
<p>Operations</p> <ul style="list-style-type: none"> • Profitability/investment returns • Poverty/lack of assets • Low-density dispersion 	<ul style="list-style-type: none"> • Low growth potential • Low velocity of capital • Non-competitive technologies • Lack of market integration • Lack or quality of roads and communication • Low efficiencies of business operations • High operating costs
<p>Capacity</p> <ul style="list-style-type: none"> • Infrastructural capacity • Technical skills and training • Social exclusion • Institutional competency 	<ul style="list-style-type: none"> • Lack of business investment • Lack of competitive technologies • Lack of roads • Lack of communications • Lack of education • Lack of technical and management skills • Lack of institutional capacity • Lack of social representation (civil society)
<p>Political and Regulatory</p> <ul style="list-style-type: none"> • Political and social interference • Regulations, policies and their application 	<ul style="list-style-type: none"> • Political interference • NGO “donation” interference • Cultural and gender constraints • Land tenure laws • Financial regulations • Tax policy

Source: Miller, “Twelve Key Challenges in Rural Finance,” FAO Rural Finance Workshop (2004).

Appendix 2 - Top 15 MFIs in India (2009)

NAME	Gross Loan Portfolio	# of Active Borrowers
SKS	960,793,988	5,795,028
Spandana	787,304,262	3,662,846
SHARE	490,923,201	2,357,456
Bandhan	332,462,204	2,301,433
AML	315,439,786	1,340,288
BASIX	223,229,799	1,114,468
SKDRDP	136,728,666	1,225,570
Equitas	134,597,374	888,600
Grama Vidiyal Microfinance Ltd.	134,568,751	772,050
Ujjivan	82,447,140	566,929
SEIL	77,876,659	199,731
GFSPL	73,420,428	352,648
Cashpor MC	59,461,459	417,039
BISWA	58,971,572	305,679
FFSL	54,332,892	257,991
TOTAL	3,922,558,181	21,557,756

Source: Mix Market, <http://www.mixmarket.org/mfi/country/India>

Appendix 3 - Number of SHG that Save with Formal Banks in India (2008-2009)

(Rs in crore)

Agency	Position as on	Total SHGs' Savings with the banks as on 31 March 2008 / 2009				Per SHG Savings (Rupees)	Out of Total : SHGs' savings with banks under SGSY	
		No. of SHGs	% Share	Amount	% Share		No. of SHGs	Amount
Commercial Banks (Public & Private Sector)	31.03.08	2810750	56.1	2077.73	54.9	7392	765775	527.02
	31.03.09	3549509	58.0	2772.99	50.0	7812	931422	681.60
	% growth	26.3		33.5		5.7	21.6	29.3
Regional Rural Banks	31.03.08	1386838	27.7	1166.49	30.8	8411	357004	210.83
	31.03.09	1628588	26.6	1989.75	35.9	12218	433912	774.55
	% growth	17.4		70.6		45.3	21.5	267.4
Cooperative Banks	31.03.08	812206	16.2	541.17	14.3	6663	80291	71.66
	31.03.09	943050	15.4	782.88	14.1	8302	140247	107.24
	% growth	16.1		44.7		24.6	74.7	49.7
TOTAL	31.03.08	5009794	100.0	3785.39	100.0	7556	1203070	809.51
	31.03.09	6121147	100.0	5545.62	100.0	9060	1505581	1,563.39
	% growth	22.2		46.5		19.9	25.1	93.1

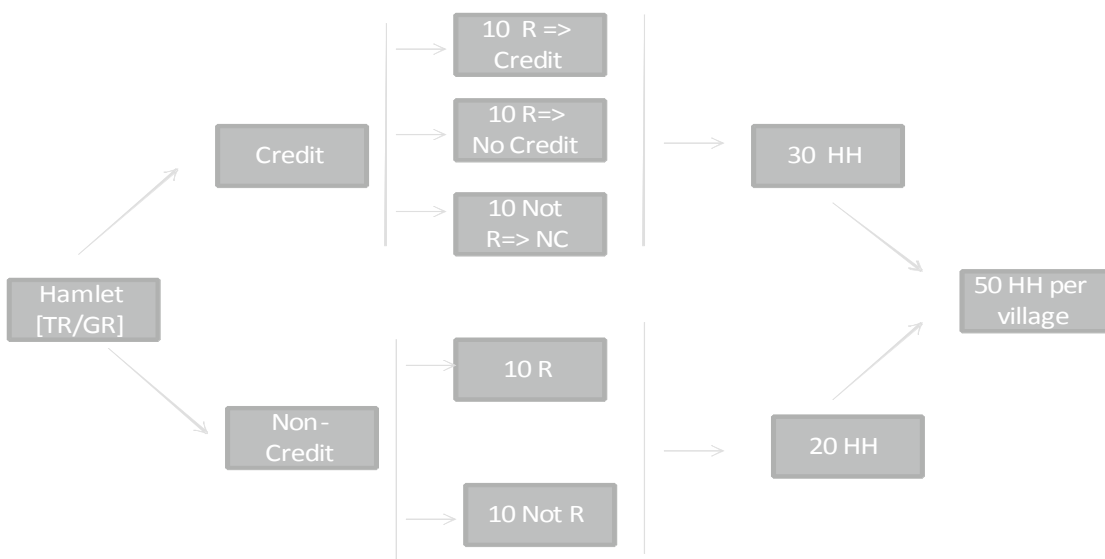
Source: National Bank for Agricultural and Rural Development, "Status of Microfinance in India – Annual Report" (2008-2009).

Appendix 4 – Baseline Data Balance

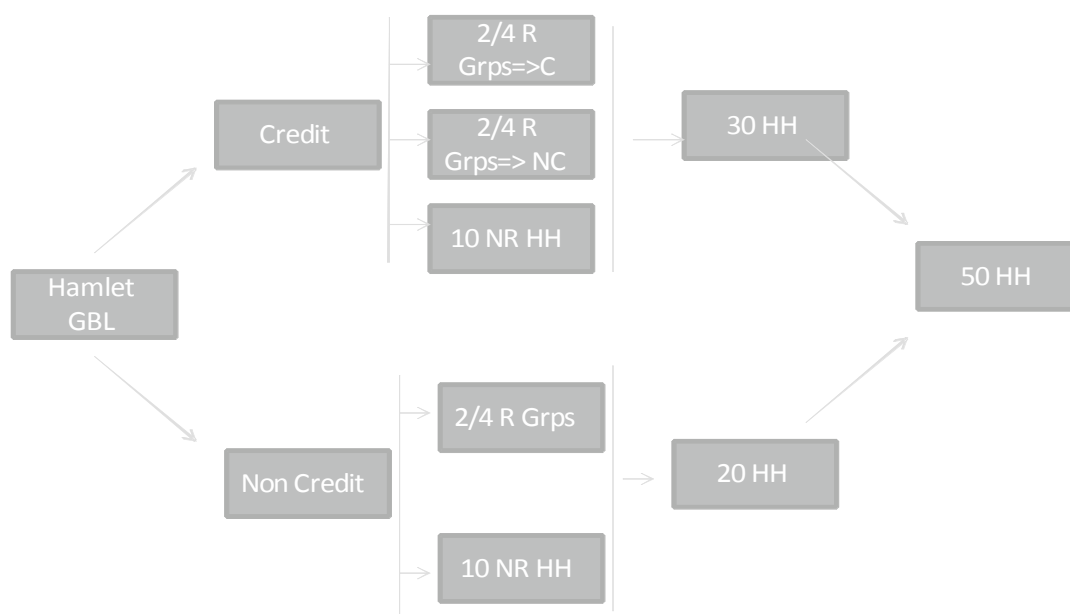
Characteristics	Control		Treatment	
	Mean	Std Dev	Mean	Std Dev
Household Size	4.786667 (2.23)	1.961326	5.809524 (3.18)	2.520531
Age of HH head	47.28667 (15.1)	12.19656	52.7381 (13.22)	14.10425
Land Owned	0.403267 (0.56)	0.568536	0.27619 (0.39)	0.339418
No of Rooms	2.246667 (1.86)	1.158202	1.880952 (1.1)	0.739228

Appendix 5 – Sample Design

TRAIL & GRAIL Sample Design



GBL Sample Design



Appendix 6 – Villages by Treatment

Village & District	Treatment Type	Agent Information
Hooghly:	TRAIL	Abbas, Potato Trader
Gazipur		
Sahapur	GRAIL	Nityananda Das, Local Government Worker
Hara	GBL	NA
Medinipur:	TRAIL	Tapan Nayak, Agricultural Input Trader
Nachanjam		
Kharikasuli	GRAIL	Banshi Mallik, Local Government Worker
Naraharipur	GBL	NA

Appendix 7 – Quotes and Views from Qualitative Survey

Debate on Randomization:

- Quote from 2nd GRAIL agent about why he does not like randomization

“If only ten were to be recommended and selected, I would have extended the names of only the best ones. As we were to recommend twenty, I had to put forth a few names randomly. This was unfair. It has also strained our relationship with the ones who lost out on the lottery or were not recommended.” –Nityananda Das, GRAIL Agent, Sahapur

- Quote from NGO about why randomization is not so bad

“We do understand it is an experiment and not everyone can be a part of it, like in science. We are sure if it is successful, it will be phased in and everyone will benefit.”Manda Unnayan Shongshod [NGO]

Quotes by Farmers:

- Quote from a farmer that was recommended and took the loan about why he took part in the process.

“I have known Tapan Nayak [TRAIL Agent] for a very long time and when he informed me about the opportunity to receive a loan, I agreed to participate.”-Pradip Karmakar, Small Farmer, Nachanjam.

- Quote from a farmer that was recommended, won the lottery, but did not take the loan about why he did not take the loan

“ I already repaying my debts from other sources, I am landless and on some days I cannot even afford food. This loan would be extra burden.” Shyamapada Kole, Landless, Sahapur

Quotes by TRAIL agent:

“I am a part of this village and want to help people. But, I do not have resources to do good on this scale. This was a good opportunity.”Tapan nayak, TRAIL Agent, Nachanjam

“Getting involved in this project has helped me deepen my social relations, above and beyond my business clientele relation.”

Quotes by GRAIL agents:

“I was selected as the proxy as I had very good relations with the poor farmers and I was deemed as most trustworthy and most capable”. Biswajeet Das, GRAIL Proxy, Sahapur.

“The main ideal of our political party is to do good and I see this as a chance to serve the poor”.
Proxy

“In my spare time I help the poor by giving advances and credit.” Proxy

“I tell the farmers that this is an opportunity to increase yields and reduce food insecurity”.
Nityananda Das, GRAIL Agent.

“You should scale up this lending scheme. There is a lot of demand for credit in this format.”
GRAIL Agent

“I want to help people progress. This is an apt opportunity; I am doing good and lending a helping hand.” Banshi Mallik, GRAIL Agent, Kharikasuli

“If they are unable to repay, we will engage them in more productive employment that would help him garner funds to repay.” Koushik Singha, GRAIL Assistant

“The additional responsibility is not a burden, but it helps me get acquainted with important people and is deepening my social ties.” GRAIL Agent

“All the clients are supporters of the same political party as I”. GRAIL Agent

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