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Performance and Governance Challenges of a Government-funded Microcredit Program for the Handloom Weavers in Bangladesh

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I dedicate this thesis to my late father, Md. Rabiul Karim, and Mother, Mst. Nasima Khatun, who always wanted me to pursue a doctorate. I believe that their prayers and good wishes were always with me which paved the way to my destination.

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List of Abbreviations and Acronyms

2SLS	Two-stage Least Squares
AAEA	American Agricultural Economist Association
AIM	Amanah Ikhtiar Malaysia
ASA	Association for Social Advancement
BBS	Bangladesh Bureau of Statistics
BHB	Bangladesh Handloom Board
BKB	Bangladesh Krishi Bank
BoS	Board of Studies
BRAC	Bangladesh Rural Advancement Committee
BRDB	Bangladesh Rural Development Board
BRI	Bank Rakyat Indonesia
CGA	Controller General of Account
DAAD	German Academic Exchange Service
ECNEC	Executive Committee of the National Economic Council
FAO	Food and Agriculture Organization
GB	Grameen Bank
GoB	Government of Bangladesh
IMF	International Monetary Fund
IV	Instrumental Variable
KI	Key Informant
KII(s)	Key Informant Interview(s)
LIFCHASA	Livelihood Improvement of Farming Community in Haor Areas through System Approach
LPM	Linear Probability Model
MED	Monitoring and Evaluation Department
MF	Ministry of Finance
MFI(s)	Microfinance Institutions(s)
MP	Ministry of Planning
MRA	Microfinance Regulatory Authority
MTJ	Ministry of Textile and Jute
NGO(s)	Non-government Organization(s)
NST	National Science and Technology

OLS	Ordinary Least Squares
PID	Planning and Implementation Department
PKSF	Palli Karmo Sahayak Foundation
PNM(s)	Process Net-map(s)
RAKUB	Rajshahi Krishi Unnayan Bank
RDRD	Rangpur Dinajpur Rural Servicw
SMD	Society and Marketing Department
TEKUN	The Economic Fund for National Entrepreneurs Group
USD	United States Dollar
VIF	Variance Inflation Factor
WB	World Bank
WO	Weaver Organization

Executive Summary

Microfinance is an important policy tool for poverty reduction and employment generation in developing countries. The first microfinance institution was developed in Bangladesh in the 1970s. Since its inception, many studies have been conducted on different aspects of microfinance, such as outreach, impact and sustainability. However, these studies have mostly been limited to the performance of microcredit programs operated by non-government organizations (NGOs). Therefore, it is justified to shift the focus from NGOs to microcredit programs operated by the public sector. To fill this knowledge gap, a case study of Bangladesh Handloom Board (BHB)'s microcredit scheme has been conducted, which represents a publicly sponsored credit program targeting handloom weavers.

Using a mixed methods approach, this thesis has analyzed three dimensions of the selected credit program: impact assessment, repayment performance, and governance challenges. These three topics are covered by three different papers in the thesis. The first two papers apply quantitative techniques whereas the third one adopts a qualitative approach for assessing the institutional viability.

The objective of the first paper is to estimate the impact of BHB's microcredit scheme on the handloom weaver's investment behavior in Bangladesh. From a policy perspective, this analysis is relevant for two reasons. First, it fills the gaps in the impact assessment studies of credit which have largely neglected the government-run microcredit programs. Second, the article provides insights for the promotion and continuation of this public credit program. Using an Instrumental Variable (IV) Two-stage Least Squares (2SLS) regression model, the study findings reveal that the government credit program alone is not sufficient to increase the investment in the handloom sector of Bangladesh. The credit received from sources other than BHB was thought to be more relevant with regard to this goal. However, this result also implies that access to multiple sources of credit put borrowers into a debt trap, which makes them economically worse off after repaying loans with interest. As a result, productive investment does not take place through the credit program. This finding, however, does not imply that the credit program should be stopped. It is concluded that the credit amount available under this program for technology adoption in the handloom sector should be increased. Moreover, providing credit for power looms will facilitate a structural change from using handlooms to power looms, which may provide a more sustainable means of future livelihood for current handloom weavers.

The second paper analyses the credit repayment of the BHB's microcredit scheme. Considering that the repayment rate (which is regarded as one of the success factors of the credit program) was only 65% as of June 2015, this study identifies factors that contribute to such low repayment rate, which makes government-sponsored microcredit programs financially unsustainable. This analysis is important to guide the public credit institutions to design a better lending policy by focusing on the factors that require special attention while lending to the eligible borrowers. Using a Probit model, this study reveals that socioeconomic and community-level factors associated with the borrowers played an essential role in determining timely loan repayment. Some of these factors were beyond the control of the credit institution. In conclusion, this study suggests strengthening the loan monitoring system by opening up more branches so that the timely delivery of financial as well as non-financial services to borrowers can be assured.

The third paper examines the governance challenges faced by the BHB. The analysis is based on the findings of the previous two papers. As the findings from both papers highlight the challenges of BHB, it is important to understand why such challenges occur when implementing a government-sponsored credit program and from where they exactly originate. This analysis also has implications for policy revision and reformulation of BHB, which should be guided by a better understanding of the organization-specific problems that a government-funded microcredit program is facing. These challenges are assessed by using a qualitative research method called Process Net-map. The use of this method helps to understand how the credit program is implemented in practice, which may deviate from the prescribed implementation plan. Moreover, this study analyzes the challenges that arise from the perspectives of both the supply-side and the demand-side stakeholders of BHB. The major finding of the first paper is supported by the outcome of this paper as it reveals that shortage of funds was the main obstacle for implementing BHB's microcredit scheme, which failed to meet the clients' financial needs. Besides this problem, the shortage of adequate staff was responsible for weak field administration, which is amplified by the lack of incentives to motivate them. Political influence and corruption in the system were also identified as central challenges. From the beneficiary-side, high opportunity cost to get loans, lack of non-financial services, inadequacy of funds, and difficulty in group formation were also major problems. A lack of transparency in information flow between groups was also noted as a problem. This paper concludes that a poorly designed program which fails to address the organization-specific challenges of government-run microcredit program will not improve the livelihood of the intended beneficiaries. Hence, the study recognizes the credit program's

need for a better legal and regulatory framework to address the governance challenges that are identified. The focus should be placed on flexible, demand-driven, bottom-up and participatory initiatives.

Overall, the study concludes that government-run microcredit programs, affected by problems from large bureaucracies, face specific challenges, which tend to be larger than those faced by NGO-run microcredit programs. One possible solution may be an enhanced collaborative system that involves both public and private credit institutions as it may encourage cross-sector learning.

Zusammenfassung

Mikrofinanzen, ein Begriff der auch das Konzept von Mikrokrediten umfasst, ist ein wichtiges Politik-Instrument zur Reduzierung von Armut und Generierung von Arbeitsplätzen in vielen sich entwickelnden sowie unterentwickelten Ländern. Das Konzept hat seine Ursprünge im Bangladesh in der Dekade um 1970. Seit seiner Einführung hat sich eine große Zahl von Studien mit verschiedenen Aspekten von Mikrofinanzen befasst. Darunter Aspekte wie Reichweite, Auswirkung, Nachhaltigkeit und verwandte Themen. Allerdings ist die Literatur zu Mikrokrediten im Wesentlichen auf die Messung der Performance von Kreditprogrammen in der Landwirtschaft sowie von Nichtregierungsorganisationen (NGOs) beschränkt. Deswegen argumentiert diese Studie, warum der Kreditfokus von landwirtschaftlicher Unterstützung zu nicht-landwirtschaftlicher Unterstützung und von NGOs zu öffentlichen Kreditprogrammen rücken soll. Dieses Argument wäre nur valide, wenn eine empirische Studie zeigen würde, zu welchen Grad öffentliche Kreditprogramme ländlichen, nicht-landwirtschaftliche Kreditnutzern nutzen. Um diese zu untersuchen, wird hier ein Mikrokredit-Modell des „Bangladesh Handloom Board (BHB)" (Bangladesh Handwebstuhl Ausschuss) betrachtet. Die Fallstudie repräsentiert ein staatlich-finanziertes Kreditprogramm mit einem Fokus auf Weber mit Handwebstühlen als nicht landwirtschaftliche Haushalte.

Mithilfe von gemischten Methoden (mixed methods), wurden drei Hauptindikatoren von ausgewählten Kreditprogrammen betrachtetet: Auswirkungen (Impact), Rückzahlungsraten und Governance Herausforderungen. Diese drei verschiedenen Analysen repräsentieren die drei verschiedenen Artikel in dieser Thesis. Die ersten beiden wurden mit quantitativen Methoden analysiert; der letzte nutzt einen qualitativen Ansatz um die institutionelle Lebensfähigkeit des Programmes zu bewerten.

Das Ziel des ersten Artikels war es, die Auswirkungen (Impacts) des BHB-Kreditmodells auf Investitionsverhalten von Handwebstuhl-Webern in Bangladesch zu analysieren. Aus Politik-Perspektive ist diese Analyse aus zwei Gründen wichtigen. Erstens, um eine Forschungslücke in der Literatur zu Bewertung von Krediten zu schließen, die bislang den nicht-landwirtschaftlichen Sektor sowie Kreditprogramme von Regierungen ignoriert hat. Zweitens, ermöglicht der Artikel Einblicke in die Förderung von Weiterführungen von öffentlichen Kreditpolitiken basierend auf deren geschätzten Auswirkungen (Impacts). Mithilfe von Instrumentenvariablen (IV) und einem "two-stage least squares" (2SLS) -Regressionsmodell zeigt diese Studie, dass öffentliche Kredite kein ausreichendes Mittel sind, um die

Investitionen im Handwebstuhl-Sektor von Bangladesch zu steigern. Selbst Kredite von anderen Quellen als der BHB zeigen die Risiken von Geldleihen, da die geschätzten Koeffizienten statistisch signifikant und negativ sind. Das Ergebnis bedeutet, dass Kreditnehmer durch den Zugang zu verschiedenen Krediten in eine Kredit-Falle geraten. Nachdem sie die Kreditverpflichtungen mit Zins zurückbezahlt haben stehen sie deswegen ökonomisch schlechter da als zuvor. Deswegen finden durch die Kredit-Initiative keine produktiven Investitionen statt. Das bedeutet nicht, dass das Kreditprogramm beendet werden soll. Die Studie empfiehlt die Höhe von Krediten zur Adoption von Technologien in der Handwebstuhl-Sektor zu erhöhen. Solche Kredite für Webmaschinen werden einen strukturellen Wandel von Handwebstühlen zu Webmaschinen ermöglichen und dadurch nachhaltige Formen des Lebensunterhalts ermöglichen.

Die Auswirkungen von Kredit sollten nur positiv sein, wenn die Kredit-gebende Organisation die erwarteten Dienstleistungen entsprechend der Kreditnehmer-Nachfrage bereitstellen kann. Allerdings fand diese Studie, dass die Rückzahlungsrate des ausgewählten Falles (der als Erfolgsfaktor des Kreditprogrammes gilt) lediglich 65,71 % betrug (Stand Juni 2015). Diese Zahl motivierte diese Studie, eine zweite Analyse durchzuführen, welche die Faktoren, die zu der niedrigen Rückzahlungsrate unter von Regierungen geförderten Mikrokreditprogrammen beitragen, zu analysieren. Das ist essenziell, da die niedrige Rückzahlungsrate die Organisation finanziell un-nachhaltig macht. Die Analyse erbringt wichtige Hinweise zur besseren Gestaltung von Kredit-Politiken (Leih-Bedingungen) von öffentliche Kredit-Instituten durch einen Fokus auf Faktoren, die spezielle Aufmerksamkeit verlangen, wenn Kredite and berechtige Kreditnehmer bereitgestellt werden. Andernfalls, fließt Geld and jemanden der weder in der Lage ist das Geld angemessen zu nutzen noch es zurückzuzahlen. Solcher Transfer von Geld and falsche Klienten führt zu organisatorischer Un-Nachhaltigkeit. Die Ergebnisse der Probit-Modell-Schätzungen zeigen, dass Eigenschaften von Kreditnehmern (sozioökonomische und Faktoren auf Gemeinschaftsebene) eine entscheidende Rolle mit Blick auf die pünktliche Zurückzahlung spielen. Manche dieser Eigenschaften sind außerhalb der Kontrolle von Kredit-Institutionen. In dieser Hinsicht, empfiehlt diese Studie eine Stärkung von Kredit Monitoring Systemen durch das Eröffnen von weiteren Zweigstellen, sodass die Bereitstellung von finanziellen und nicht-finanziellen Dienstleistungen an Kreditnehmer in Zeit sichergestellt werden kann.

Der dritte Artikel beschäftigt sich mit den Governance Herausforderungen des ausgewählten Kredit-Programmes. Die Analyse basiert auf den Ergebnisse der ersten beiden Studien. Da

beide Studien wesentliche Schwachstellen des analysierten Programmes gezeigt haben, ist es wichtig zu verstehen, wo und warum die Herausforderungen in der Implementierung von staatlich-geförderten Kreditprogrammen entstehen. Die Analyse hat ebenfalls finanizielle Implikationen für Politik-Überarbeitungen und Re-Frmulierungen, die durch ein besseres Verständnis der organisatorischen Probleme verbessert werden können. Diese wurden durch die Nutzung einer neuen qualitativen Methode, genannt Prozess Net-Map (PNM), beurteilt. Diese Methode hilft, besser zu verstehen, wie Kreditprogramme in der Praxis umgesetzt wurden und inwiefern dies von dem vorgesehenen Implementierungsplan abweicht. Darüber hinaus analysiert diese Studie die Herausforderungen aus der Perspektive von Stakeholdern auf der Angebotsseite sowie Nachfrageseite der untersuchten Kreditprogramme. Das Hauptergebnis des ersten Artikels wird durch die Ergebnisse dieser Studie unterstützt: Sie zeigt, dass ein Fehlen von Geldmitteln eine Hauptherausforderung für die Implementierung von staatlichen Programmen ist, welche die finanziellen Bedürfnisse von Kunden nicht erfüllen. Daneben ist das Fehlen von Arbeitskräften sowie eine unzureichende Administration für das Scheitern verantwortlich. Die Problem werden durch das Fehlen von Anreizen für die Mitarbeiter verstärkt. Politischer Einfluss und Korruption im System sind ebenso zentrale Herausforderungen. Von Seiten der Begünstigtsten sind die wesentlichen Probleme hohe Opportunitätskosten von Krediteintreibung, das Fehlen von nicht-finanziellen Dienstleistungen sowie von adäquaten Geldmitteln und Probleme in der Formierung von Gruppen. Außerdem wurde das Fehlen von Transparenz hinsichtlich von Informationsflüssen zwischen Gruppen notiert. Abschließend findet die Studie, dass nicht fachgerecht entworfene Programme, die die organisations-spezifischen Herausforderungen nicht angemessen adressieren, die Lebensbedingungen der Begünstigten nicht verbessern. Es gibt also einen steigenden Bedarf an öffentlichen Programmen, entsprechende legale und regulatorische Rahmenbedingungen zu entwerfen, um diese Herausforderungen zu meistern. Dabei sollte der Fokus auf flexiblen, Nachfrage-getriebenen (bottom-up) und partizipativen Initiativen liegen.

Insgesamt zeigt die Studie, dass öffentliche Klein-Kreditprogramme tendenziell mit größeren Problemen konfrontiert sind als NGO-geförderte Programme. Die Studie empfiehlt ein verbessertes kollaboratives System zwischen öffentlichen und staatlichen Kredit-Institutionen, so dass beide von den Design- und Implementierungspraktiken des jeweils anderen profitieren können.

1 Introduction

1.1 Background

Including the poor and hardcore poor households under the banking culture who are often regarded as unbankable is one of the major challenges of development in most of the developing countries. Such exclusion results due to not having adequate collateral in obtaining the bank loan, an association of high transaction cost, lower and unstable income of the poor and the similar issues (Al-Mamun et al., 2011). Pleasantly, the introduction of 'microfinance' rooted from Bangladesh by Mohammad Yunus during the 1970s through the establishment of Grameen Bank (GB) has opened the door to the development within the short time span. Since then, it is serving as a replicative, active and empowering policy instrument of poverty reduction and employment generation of the governments of many marginally growing countries (Sharma and Zeller, 1997; Siwale and Ritchie, 2011; Rahman et al., 2012).

The novel principle of lending to small groups by GB proved its success in securing higher repayment. Being inspired by the success of GB, numbers of NGOs emerged over the next two decades such as BRAC[1], ASA[2], Proshika, and others which aimed at rapidly improving the access of poor to the credit facilities. This period, therefore, is termed as the rapid expansion phase or the 'first generation' of microfinance. Since the mid of the 1990s, these NGO's have dominated the development discourse in Bangladesh through the introduction of various innovative practices along with credit, such as training, education, health, savings, remittance, and insurance and others approaches. Therefore, this period is termed as the 'second generation' of microfinance. Such approaches have made not only the GB but also other notable NGOs as successful credit institutions in Bangladesh, thereby, established a thriving glory of the country as the role model of poverty reduction to the international community. While the NGOs were progressing in efficiently reaching the clients by providing the social and financial services, particularly to agricultural households, government's interventions were still limited to creating the regulatory environment for the NGO-led Microfinance Institutions (MFIs) or at least not to restrict their activities (Hulme and Moore, 2006).

[1] Bangladesh Rural Advancement Committee
[2] Association for Social Advancement

Such limited interventions from the government have raised some open questions regarding the extent to which government credit program serves the financial needs of the rural households over the NGOs. To fill this knowledge gap, the performance of government-run non-agricultural credit program in Bangladesh is explored in this thesis using a case study approach. It has focused on three leading indicators of studied credit case (elaborated in section 1.5) such as impact, repayment performance and governance challenges to judge whether the government and non-agricultural programs are more successful than NGO's and agricultural credit programs in Bangladesh. In this chapter, the background and problem statement are discsussed at first, followed by the research objectives, questions, and hypothesis. The next section highlights the study context including a short description of the case and the study area. The methodology of the study is summarized afterward. The significance of the study is pointed out before describing the layout of the thesis in the last part.

1.2 Problem Statement

Even though the economies of most of the developing countries are dependent on agriculture, the participation in non-agricultural activities is encouraged at the national level to stabilize the livelihood in the rural areas. The reason behind this is that agricultural production is significantly affected by the frequent natural disasters. It also contributes to the lower income than non-agricultural or off-farm income (Reardon et al., 1994; Pitt, 2000; McNamara & Weiss, 2005). Unfortunately, the growth potential of many small and medium-scale enterprises is constrained by the lack of investment capital in purchasing the adequate amount of raw materials or adoption of technology. This situation hampers the operational efficiency and shrinks the business scale as well as the economic growth of the country (Gelos & Werner, 2002; Kohansal et al., 2008; Hertz, 2009; Love and Sánchez, 2009; Anyiro and Oriaku, 2011; Vandercasteelen, 2011; Hohfeld & Waibel, 2013). These views signify the credit need for the non-agricultural small-scale entrepreneurs. Even though few authors (Pitt, 2000; Diagne and Zeller, 2001) have studied the access to credit and its impact on diversification of household activities between agricultural and off-farm activities, none of the cases used in these studies was the public credit program.

However, the literature reviews on the microfinance impact assessment studies (e.g., Pitt & Khandker, 1996, 1998 & 2002; Foltz, 2004; Asanoy, 2004; Chowdhury et al., 2005; Kiiru, 2007; Rahman et al., 2009; Rahman & Ahmed, 2010; Islam et al., 2011; Kon et al., 2012;

Akwaa-sekyi, 2013; Khandker & Samad, 2013; Luan, 2015; Ferdousi, 2015; Khandker and Koolwal, 2016 and others) inform that MFIs are reluctant to providing the adequate finance for non-agricultural enterprise development. However, it seems not to be the case for the agricultural enterprises as almost all the studies mentioned above estimated the impact of agricultural credit on various household-level outcomes such as poverty and vulnerability, income and profitability, savings, entrepreneurship, women empowerment and others. Also, many of these studies (e.g., Pitt & Khandker, 1996, 1998 & 2002; Rahman et al., 2012 and others) undertook NGO's programs as the successful cases, particularly in Bangladesh. On the contrary, none of them are found to be the non-agricultural and government credit program except Petrick (2004). Even though this study used governmentally promoted credit programs as the study base, however, it also focused on farm households' investment estimation due to the credit access. Therefore, it can be summarized from the review of these studies that there are limited numbers of studies investigating the impact of public credit on the welfare of non-agricultural households.

From the methodological perspective, it is evident from those studies that a variety of methods were applied to assess the microfinance's impact. They included the descriptive analysis, OLS regression, non-linear probability models (e.g., probit, logit), Heckman selection, simultaneous equations, fixed effect estimation model, propensity score matching, difference-in-difference, 2SLS and many others. It has also been observed that the output of these estimations differed among different studies, most probably due to the variations in the assumptions underlying each method which provided mixed knowledge to the existing literature. For example, Rahman et al., (2009), Rahman et al. (2010), Onyeagocha, et al. (2012), and Khandker and Koolwal (2016) estimated a significant positive impact of credit on the household outcome whereas Godquin (2004), Nawai and Shariff (2012), and Shu-Teng et al. (2015) estimated a significant inverse relationship. On the contrary, Luan (2015)'s study identified both positive and negative impact over different experiments whereas there are some authors (i.e., Kohansal et al., 2008; Ibrahim, 2013) who did not even find any connection between the two. In that pursuit, this study finds it difficult to judge the significance of the model used in estimating the impact of credit on the investment level of non-agricultural borrowers under the government-led microcredit program (Chapter 2).

Yet, it can be claimed in line with Pitt and Khandker (1998) that many of those studies simply ignored the self-selection bias of the participants into the program. However, such ignorance can contribute to the failure of the impact assessment models in screening out the probable

effects of unobserved household level determinants which can also alter the household outcome. Sometimes, the non-randomized program placement also leads to the estimation bias (Khandker et al., 2010). Additionally, Baqui Khalily (2004) and Hasan et al. (2013) emphasized the fungibility criterion of credit. According to them, the fungibility criterion of credit use often makes it difficult to utilize the loan money productively in the face of the low gestation period. In that situation, it prevents the households from attaining the potential impact from their credit use. Furthermore, it poses the question of how well microcredit meets the financial requirement of the households particularly for those who need it most. As per those authors, the impact estimation of credit is difficult as it requires multiple issues to be dealt with at the same time. It also requires an appropriate model that can solve these problems or the use of panel data. However, the majority of the studies cited above neglected such considerations while estimating the impact of credit except the studies by Pitt and Khandker (1998 & 2002), Rahman et al. (2009), and Khandker & Koolwal (2016). From this standpoint, the significance of this study is justified as it has employed the 2SLS regression model with IV which has the potential to untangle the causality effect of unobserved variables due to endogeneity, self-selection, or fungibility issues of credit while estimating the impact.

Apart from the unique methodological application on the highlighted experiment under objective 1 (section 1.3), it is justified that to what extent government-sponsored credit program improves the welfare (i.e., investment in this case) of non-agricultural household is still missing from the literature. Therefore, this study intends to address this knowledge gap through the empirical analysis in Chapter 2.

The second empirical estimation (Chapter 3) is directed towards the repayment performance analysis of the studied case. Authors like Moreno (2004) and Anignogu et al. (2014) noted that how efficiently the MFIs provide the financial services depend on the economic sustainability of the organization which is mostly determined by the higher repayment coverage. However, Kohansal and Mansoori (2009) and Nawai and Shariff (2012) noted that the MFIs that receive fund from the government, local government or donor funds are unsustainable and highly dependent on subsidies. Similarly, authors such as Sharma and Zeller (1997) and Kamanza (2014) criticized that public credit program is less sustainable than the private programs due to its failure to control default cases which results in lower repayment rate. For example, the repayment defaults in two of the government operated youth and women unemployment solving credit programs in Kenya were accounted at 40% and 50% respectively under the study by Njangiru et al. (2014). All these studies signify the

necessity of ensuring higher repayment to continually providing the services to small and micro entrepreneurs and making the MFIs financially sustainable.

Even though there are studies on repayment performance of microfinance programs (e.g., Sharma and Zeller, 1997, Godquin, 2004; Al- Mamun et al., 2011), these studies also have ignored the case of public credit program and its performance except Nawai & Shariff (2012) and Mokhtar et al. (2012). In fact, all these studies were also limited to the performance assessment of the successful MFIs such as GB, BRAC, ASA, BRDB[3], RDRS[4], PKSF[5], BRI[6], AIM[7], TEKUN[8] and others. As these programs have already been successful through better governance practices, further selection of them as a case may not be so feasible in formulating the policy for the programs that are struggling to survive in the present competitive environment of microfinance and are looking for the ways to come out of the poor condition. Against this theoretical background, this study attempts to empirically identify the factor that contributes to the lower repayment performance under state-sponsored non-agricultural credit program under the second objective of the thesis.

The third intensive study aims to examine the institutional perspectives of the selected government-promoted microcredit program (Chapter 4). Keeping the issue of the unsustainability of the public credit program under consideration (as is examined under objective 2 of Chapter 3), this study qualitatively attempts to understand the process of credit implementation and the challenges faced by the studied credit institution while providing the services to the borrowers. Regarding the practical implications, this analysis is vital for the financial policy revision and reformulation guided by the better understanding of the organization-specific problems that require urgent attention from the government as well as from the lending institution.

It is noted by Moreno (2012) and Morvant-Roux et al. (2014) that microcredit programs inherently involve several barriers as the fund passes through several processes. It can even be worse than the expected tolerance level if the processes are not appropriately governed (Hartarska, 2005; Thapa, 2010). In addition to the poor governance, many other authors (e.g., Ahmed, 2009; Thapa, 2010, Nawai and Shariff, 2012; Shu-Teng et al., 2015) noted that most of the public programs believe on providing service other than making the profit. Therefore,

[3] Bangladesh Rural Development Board
[4] Rangpur Dinajpur Rural Service
[5] Palli Karmo Sahayak Foundation
[6] Bank Rakyat Indonesia
[7] Amanah Ikhtiar Malaysia
[8] The Economic Fund for National Entrepreneurs Group

the transaction cost of public programs is always high as compared to the NGO's program. In many cases, borrowers seem to be unwilling in repaying their loan because of their wrong perception that the public fund is distributed to them as a means of subsidy support from the government. Such attitude also contributes to the organizational failure. In addition to that, Ahmed (2009) mentioned about the lack of transparency between the actual allocation and distribution of fund under the public credit programs which often contributes to the misuse of the organization's financial resource. Moreover, the successful service delivery is thought to be correlated with adequate organizational structure along with sufficient human and capital resource endowments. If not, the ultimate result would be the delivery of indigent services such as untimely allocation and disbursement of the fund that may not be helpful for the fund users. As a result, the borrowers are demotivated from their timely repayment while contributing to the institutional failure. Whatever the reasons are, the underestimation of such challenges may adversely affect the organization providing quality services to the borrowers (Zaman, 2013). However, there is less effort to examine why such barriers are more prominent to the implementation of public credit programs that are causing them to provide inadequate services. Therefore, it needs to be disclosed.

In this study, it is again emphasized that there are substantial numbers of national and international quantitative studies (e.g., Chawdhury et al. 2005; Rahman et al.,2009; Haq et al., 2009; Rahman & Ahmed, 2010; Hermes et al., 2011; Khandker and Samad, 2013; Quayes & Baqui Khalily, 2014; Khandker & Koolwal, 2016; Ferdousi, 2015; Luan, 2015, and others) which already have addressed why microfinance programs, particularly NGO-led ones, have performed well in improving the household welfares. In fact, these studies focus were on the client's coverage, growth, impact, financial sustainability, repayment rate, efficiency, return on equity, and the estimations of the similar quantitative indicators that serve as the success factors of microfinance programs. However, qualitative study is seldom found in examining the factors that can even cause the organization to fail. Among the existing governance-specific literature (e.g., Hartarska, 2005; Lan & Tran, 2005; Bassem, 2009; Mersland & Strøm, 2009; Kono & Takahashi , 2010; Mcintyre, 2012; Moreno, 2004; Augustine, 2012; Robinson, 2017), very few (e.g., Ahmed, 2009; Zaman, 2013; Rahman, 2007) have been conducted in Bangladesh. Majority of these studies, however, were based on the review of the performance of major MFIs mentioned throughout the introduction section. The data for those studies were mainly of the secondary type such as reports of Bangladesh Bank, country-level reports of different development organizations (e.g., IMF, WB, FAO), different organization-specific data and the similar kinds. The use of primary data is rarely found in this field.

All in all, although the quantitative analysis is undoubtedly necessary for the economic impact assessment, they are not suitable enough to understand why the governance challenges arise and from where exactly? Which factors need to be addressed to design better implementation strategies that best suit a particular organization, either public or private? Baqui Khalily (2004) also reported the same. According to the author, the valid causal inferences can only be established if the qualitative study is conducted to understand why the inference is the ways it is exhibited? Moreover, it should be guided by the quantitative estimation, more appropriately, through the case study. From this point of view, this study highlights the potential of the qualitative study in assessing the governance challenges under the third objective of the thesis through (a) utilizing the field data, (b) following the case study approach, and (c) based on the quantitative estimation results of impact and repayment performance.

Furthermore, a common tendency is observed among the microfinance scholars (cited in the preceding paragraphs) that they preferred knowing how well the treatment group is benefited from a particular program participation. It means that these studies evaluated the program from only demand-side (i.e., beneficiaries) and ignored the supply-side perspectives. Baqui Khalily (2004) also noted the same in his study entitled "Quantitative Approach to Impact Analysis of Microfinance Programmes in Bangladesh-What have We Learned?" From the governance context, Lapenu and Pierret (2006) and Moreno (2004) noted that governance related microfinance studies in developing countries are mostly conducted by supply-side stakeholders, particularly government agencies. However, the scope of research should be widened beyond the supply-side analysis and should also incorporate the civil society perspective (i.e., stakeholders from demand-side) to better understand the needed actions from both sides in the successful implementation of the program. All the studies mentioned in this on-going paragraph separately indicate the importance of supply-side and demand-side analysis. However, this study did not find any work so far that has captured the views of both stakeholders into the governance analysis. From this point of view, another contribution of the study is justified. Also, none of those studies mentioned above is found to use the recently developed method called PNM (elaborated in section 1.7.1 and section 4.4 in Chapter 4) in the field of microfinance. Therefore, it would be a unique contribution of this study in the existing body of microfinance literature.

1.3 Research Objectives

The present study aims to explore the contribution of government-funded credit program in improving the household outcome of non-agricultural rural households in Bangladesh which is the broad objective of the study. The specific objectives are:

1. To estimate the impact of government credit on the investment status of the non-agricultural households in Bangladesh.
2. To investigate the factors affecting the repayment performance of non-agricultural households under the government credit program in Bangladesh.
3. To examine the governance challenges of non-agricultural government credit program in Bangladesh.

1.4 Research Questions

The research questions of the study are:

Under objective 1:

1. To what extent government credit affects the investment decision of the non-agricultural borrowers in Bangladesh?

Under objective 2:

2. What are the factors affecting the successful repayment of the borrowers under the non-agricultural government credit program?

Under objective 3:

3. How is the government credit program implemented?
4. What are the challenges faced by the government institution while providing the credit services to the non-agricultural borrowers?

1.5 Hypotheses of the Study

Under objective 1:

1. Government credit significantly contributes to increasing the investment status of the non-agricultural borrowers.

2. The socioeconomic indicators either positively or negatively influence the investment decision of the non-agricultural borrowers.

Under objective 2:

3. The institution-specific factors of the government credit program significantly influence the non-agricultural borrowers' choice of successful repayment.
4. The individual, household and community-specific factors either positively or negatively determine the timely repayment decision of the non-agricultural borrowers.

Under objective 3:

5. The government credit provides poor quality of services due to several governance challenges
6. The supply-side challenges are highly interconnected with the demand-side challenges.

1.6 Study Context

1.6.1 Description of the Case Study: Bangladesh Handloom Board (BHB)'s Microcredit Scheme

In a broader sense, this study examines the role of the public credit program in supporting the non-agricultural activities in Bangladesh. Therefore, it requires selecting the case that reflects the idea of the current study presented in section 1.2. Baqui Khalily (2004) suggested employing the case study for providing meaningful insight on the estimated impact. Moreover, the study has selected a microcredit scheme funded by the Government of Bangladesh (shortly, GoB) and implemented by a legal and well- known public institution called Bangladesh Handloom Board, shortly BHB (BBS, 2003). The program is known as BHB's Microcredit Scheme.

It was initially launched in July 1998 as a pilot project of rural development for three years with the aim of improving the socioeconomic conditions of handloom weavers (discussed in the next section 1.6.2) in Bangladesh by means of providing working capital. After the three years, the BHB was supposed to deposit the fund allowance of 6.25 million USD[9] out of total

[9] 1 US dollar = 78 Bangladeshi Taka on an average during December 2015

6.43 million USD[10] to the government treasury while the money earned from interest was supposed to be used as a revolving fund for the further continuation of the program sustainability instead of being solely dependent on the government fund (BHB, 1998) . Unexpectedly, the project failed to do so. Therefore, the BHB extended the project for another three years and so on. Until the time of the survey during 2015, the project was still functional. The BHB has received approximately 7.94 million USD for the operation and maintenance of the microcredit program from the government as of June 2015. Out of this amount, it has delivered about 7.92 million USD to 40474 weavers to make a total of 54261 handloom devices as functional (BHB, 2015, p. i).

The BHB's operational principles are identical to a typical microcredit program operated by NGOs, particularly GB. It provides credit to groups consisting of 5-10 members having their membership in the primary Weaver Organization (WO) (called Tanti Samity in Bengali). Each of the members belongs to a weaver family, and he/she himself/herself is a weaver. Each group can have only 1 member per weaver family. All the members bear the similar socioeconomic background, and they reside in the same Ward[11]. The age limit of the members is between 18-50 years. The members elect one president and one vice-president from each group who is responsible for governing the group's liabilities. Initially, the group decides the first three members who are eligible to get the credit from BHB. Once the selection process is accomplished within the groups, the BHB further judges the actual eligibility of the selected members and disburse the loan through two specialized agricultural banks of Bangladesh: Bangladesh Krishi Bank (BKB) and Rajshahi Krishi Unnayan Bank (RKUB). The members are granted credit for a maximum of 5 non-operational weaving machines[12] so that they can be made operational after using the credit as investment capital.

The credit amount ranges between 128-231 USD approximately depending on the types of the handloom machines[13]. For example, the weavers having pit loom receive 128 USD per machine (also called loom) while semi-automated or Chittaranjan loom owners receive nearly 167 USD. There is also Kamer/Waist/Frame loom owners who receive nearly 154 USD, and weavers with Benarosy and Jamdani loom receive nearly 231 USD. The credit is delivered at

[10] BHB was supposed to pay only 6.25 million USD because the rest 1.81 million USD was given for the operational and maintenance purpose

[11] A division of city or town which mainly represents an elctive unit of a City Corporation or Municipal Corporation (https://en.wikipedia.org/wiki/Wards_of_Bangladesh).

[12] The weaving machine that is not used for productive purpose either for shortage of capital or any other technical problem is called non-operational machine. Sometimes, weaving machine is termed as weaving unit or productive unit.

[13] There are 5 different kinds of handloom machines such as Pitloom, Chittaranjan loom, Benarosy loom, Jamdani loom and Kamer/Waist loom (BBS, 2003)

an interest rate of 10% for 36 months installments. If the borrowers fail to repay their loan obligation in due time, they are obliged to bear 12.5% interest rate on the remaining amount. After disbursing the credit, a member is given three months of grace period before he/she starts repaying. However, the other members of the group are responsible for observing the loan use properly and gradually for four weeks. Overall, if a groups perform well in following all the rules and regulations of a group during that period, only then the other members are allowed to obtain the credit from BHB. A borrower is eligible to get the second-term credit only if he/she successfully repays his/her first loan. In case a borrower fails to repay his/her individual monthly installment continuously for three times, he/she is regarded as the loan defaulter (BHB, 1998). This is how the BHB's credit program is implemented in Bangladesh.

Overall, the BHB's credit program is being implemented for over 18 years in Bangladesh, as per the knowledge of this study, while no study has been conducted till date on the actual impact evaluation of the program either by BHB or any other third party. This information raised the question for the present study whether the government fund is being channelized to the borrowers who need it most? If yes, to what extent it is doing so?

1.6.2 Role of Handloom Weaving and Handloom Weavers in the Economic Development of Bangladesh

As per the Bangladesh Handloom Board Ordinance (1977), handloom is defined as a "weaving device operated manually for the production of fabrics other than 100% silk or art silk" (GoB, 1977, p. 1). The device is made of wood and iron and is operated without any mechanical power (i.e., through the exercise of people's hand and foot movement). Weaving is defined as the production practice of making cloth with the help of handloom. People who are involved in this sector are called handloom weavers. The handloom weaving sector is one of the most age-old cottage industries in Bangladesh and is classified as the small-scale handicraft enterprise (Rahman, 2013). Its history dates back to 17th century. Since that era, it is serving as the significant contributor to rural non-agricultural employment among all other off-farm employment possibilities in Bangladesh. It is labor-intensive and potentially provides employment to more than 1.5 million populations in this highly populated country. Each year, the handloom sector earns more than 128 million USD from the export of handloom products (Rahman, 2013, p. 11; Liton et al., 2016, p. 70). As per the latest 'Handloom Census' conducted in 2003, more than 28% demand for domestic cloth is met by the production from this handloom industry (BBS, 2003, p. 13). Because of all these

potentials, this sector's significance is ranked as second after the agricultural sector for the development of rural economy (Islam and Hossain, 2012, 2015; Rahman, 2013; Rahman et al., 2014; Liton et al., 2016).

Despite all these potentials, it is noted that lack of working capital is the major impediment to the growth and development of this sector in Bangladesh (Islam and Hossain, 2015). The available census of 2003 also showed that out of total 505556 handlooms, more than 38% was unproductive over the year due to the capital constraint (BBS, 2003, p. 31). This figure was calculated based on the opinion of 79% of the total 95382 reported households. In 1990, this figure was nearly 32% (BBS, 2003, p. 18, 35). Even though no latest estimates is found on this statistic, one can speculate that this rate would be more than 44% in 2017 if the trend is assumed to be constant. Such speculation implies that day by day the handloom sector is going to extinction due to the shortage of fund. In addition, several other problems are also noted that contribute to the poor economic performance by the handloom sector in recent years. According to the authors mentioned in the preceding paragraph, the adoption of cost-intensive power loom by many handloom weavers has increased the competition between the handloom and power loom products in terms of charming design and volume of produced products. Such increased volume has resulted in the reduced price per unit of cloth, thereby, hampering the market of the former and slowing down the pace of the handloom growth. Besides, the increase in the gas price has increased the cost of raw materials. The quality material is also not available at the local level. The technology adoption for modernizing the product design is also subjected to available capital which is beyond the reach of the handloom weavers. Because of all these reasons, many of the handloom weavers are leaving their traditional occupation since the past two decades which is expected to have an unemployment effect on the economy of Bangladesh. Many others are migrating to the countries like India (Banarjee et al., 2014). In this circumstance, credit is thought to be one of the primary policy options to help these weavers sustaining their livelihood in the rural setup. In fact, 1990's census report was the cornerstone for BHB to come up with a solution in 1998 using microcredit as an initiative.

Not only the BHB's credit but also the credit from various formal and informal sources is expected to promote and strengthen the handloom weaving sector in Bangladesh. Finally, the selection of the BHB's microcredit programs seems appropriate as it is consistent with the study idea presented in section 1.2. It is expected that this study will emanate the probable

solutions for better implementation of the public microcredit program in one hand, and the development of the handloom sector in Bangladesh on the other side.

1.6.3 Description of the Study Area

Bearing in mind that BHB's program is a specialized credit program which provides credit to only handloom weavers, Sirajganj district (also called Zila in Bengali) was chosen as the study area for conducting the present study. In Bangladesh, there are 10 handloom concentrated districts[14] (out of 64) of which Sirajganj is ranked first regarding the total number of handloom establishments as well as the number of operational handloom units (BBS, 2003). The district itself represents a town which is considered as the biggest of the district. It consists of 9 sub-districts (BBS, 2011) of which 4 sub-districts (e.g., Belkuchi, Ullapara, Raiganj, and Shahjadpur) were selected as the study region. The livelihood of the households in these sub-districts mainly depends on the handloom weaving occupation.

On an average, there are 14,870 handloom weaving units and 100,101 operational handloom devices in Sirajganj district. Therefore, each weaver occupies nearly 7 handlooms. More than 36% of the total 50 million meter handloom cloth production comes from this district (BBS, 2003, p. 29, 81). Materially, among the entire 30 regional offices of BHB through which the credit program is operated, this is the only district which hold the studied 3 basic centers: Sirajganj Sadar, Ullapara, and Shahjadpur. Of the total 7.92 million USD disbursed credit to total 40,484 handloom weavers covering a total of 54,261 non-operational handloom machines[15] as of June 2015, a total of 7205 non-operational devices was financed spending approximately 1.15 million USD assisting 2432 handloom weavers through the studied centers under this district (BHB, 2015, p. iii).

In addition to the above information, the communication system is well developed in this district which facilitated the easy accessibility to the clients, thereby, saved the time and cost of research. Because of all these reasons, Sirajganj district shown in Figure 1 seemed like an ideal study site for the completion of the different experiments under the broad heading of the thesis.

[14] The handloom concentrated districts are: Sirajganj, Tangail, Pabna, Narsigndhi, Narayanganj, Brahmmanbaria, Dhaka, Kushtia, Comilla and Bogra (BHB, 2003)

[15] Please remember, BHB provides credit against non-operational machine so that they can be productive.

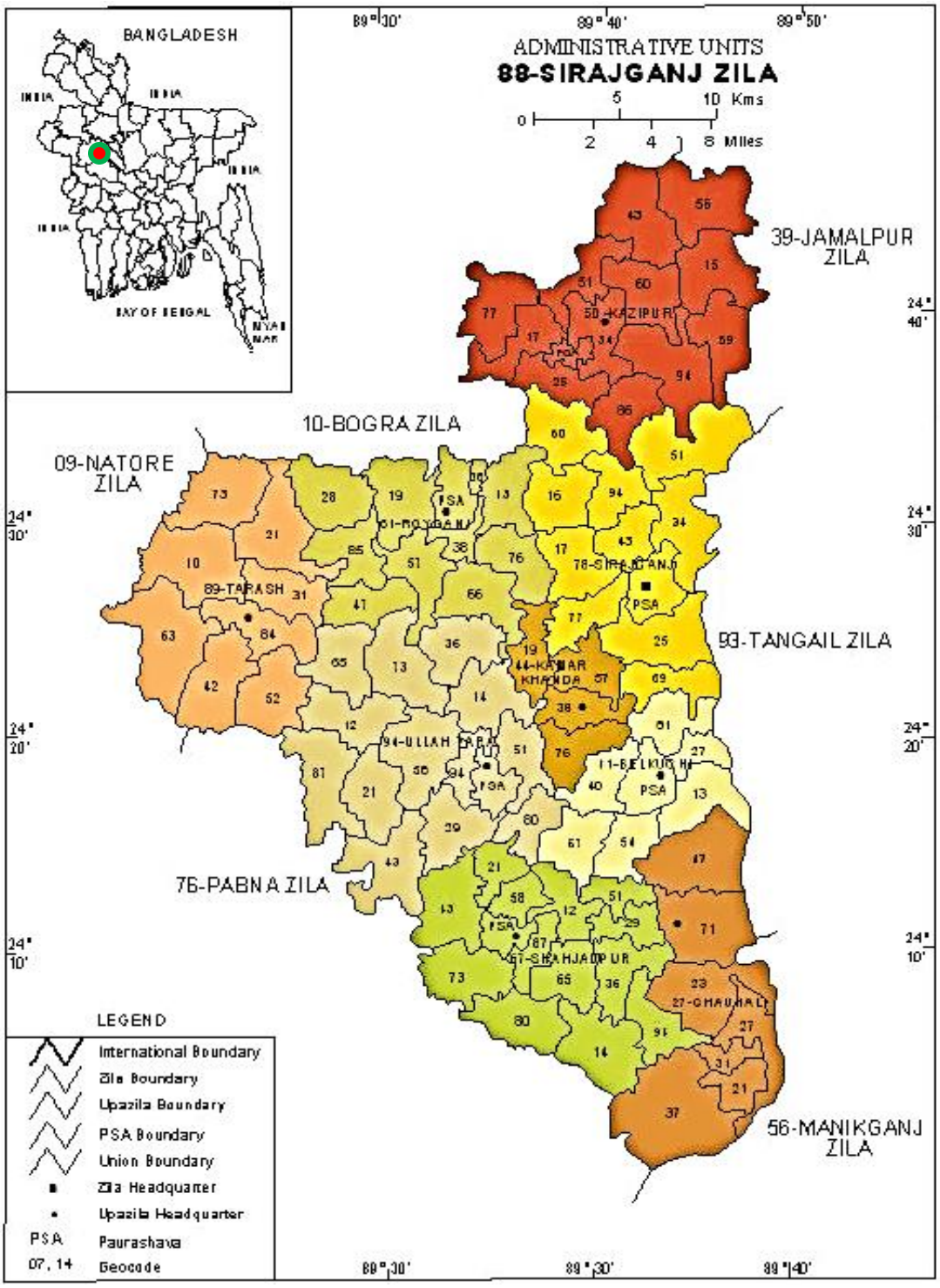

Figure 1: Map of Sirajganj district of Bangladesh

Source: BBS (2011)

1.7 Methodology of the Study

1.7.1 Sampling and Data Collection

The findings of this study highlighted in Chapter 2, 3 and 4 of the thesis are the products of both quantitative and qualitative research methods. The data used for Chapter 2 and 3 are based on the primary and quantitative data collected during July to December 2015 using multistage sampling technique. The three basic centers of BHB namely Shahjadpur, Ullapara, and Sirajganj Sadar under Sirajganj district of Bangladesh were purposively selected as the study area in the first and second stages of multistage sampling. Later on, 22 villages and 311 handloom weavers were randomly selected in the third and final stages. Out of 311 sampled weavers, close to 49% was identified as the credit users of BHB and the rest 51% was the non-users of BHB's credit. Thus, the second group serves as the comparison group in the impact assessment study (Chapter 2). On the other hand, Chapter 3 has investigated the loan repayment performance for BHB's users only. Therefore, the sample size is restricted to 151 in that Chapter. Moreover, a structured questionnaire (Appendix 6.1) was used to collect the data on the borrowers' and non-borrowers' socioeconomic condition, resource endowments, infrastructural facilities, access to finance and the related information to carry out the first and seconds objectives of the thesis.

For the third objective, a newly developed participatory method by Shiffer (2007) called Process Net-map (PNM)[16] was used to collect the qualitative information on the challenges faced by both BHB and its beneficiaries. The use of the method was also advantageous to diagrammatically understand how the BHB's credit program is implemented, who is most influential stakeholder in the implementation process, who is responsible for causing such challenges and from where those problems occur in the system? In addition to the PNM, a total of 43 Key Informant Interviews (KIIs) were also conducted with the key stakeholders from both the supply-side and the demand-side. In doing so, a semi-structured interview schedule was used (Appendix 6.2).

In addition to the primary data, secondary data was also collected from Bangladesh Bureau of Statistics (BBS), published and unpublished articles, theses, census and survey reports, books, manuscripts, policy papers and others.

[16] For more information, https://netmap.wordpress.com/process-net-map/

1.7.2 Methods of Data Analysis

For objective 1

To carry out the objective 1, the Instrumental Variable (IV) Two-Stage Least Squares (2SLS) regression model has been used in this study. It is one of the well-known impact assessment models which are suitable to deal with the endogeneity problem of the study. Endogeneity is generally defined as a situation when one or more of the regressors in a standard regression model are correlated with the error term (Wooldridge, 2002a & 2002b and Khandker et al., 2010). Theoretically, if the study assumes that credit is correlated with the risk aversion motive or the motive of being economically solvent that the study did not take into consideration during the survey period, the omission of these unobserved qualitative variables from the model estimation is expected to cause endogeneity of the credit variable on the outcome. In that situation, the model provides biased estimates.

To solve this problem, this study has used some variables as the instruments which act as the proxy of the theoretically suspected omitted variables. Additionally, the study has also considered the sample borrowers' access not only to BHB's credit but also to other credit sources. Therefore, there are two endogenous variables in this study which calls for expanding the model one-step further. It also needs to identify the instruments for both credit variables. However, the instruments require satisfying the conditions that it should be correlated with the credit variables as well as it should be uncorrelated with the error term. This study, using some post-estimation tests, has proved that the instruments used in the model are valid and thereby the use of 2SLS regression model is needed for the valid impact estimation of the BHB's credit program. The detailed theoretical explanation, model specification, and the study results can be found in Chapter 2.

For objective 2

Under the objective 2 (Chapter 3), the study has classified the borrowers between two groups as successfully repaid borrowers and the defaulters. As the decision choices of the borrowers fall between two values: zero and one, the Probit model has been used in this study to identify the factors that affected the borrowers' repayment performance. In fact, the choice of the model is based on the suggestions by several authors such as Gujarati and Porter (2008), Gebremedhin (2010), Awunyo-Vitor (2012) and others. According to these authors, when the dependent variable of the study has the binary nature, the use of limited dependent variable models such as Probit or Logit is more appropriate than linear models such as OLS. In this

model, several individual, household and community level factors are used in addition to some institution-specific factors to check which factors require much attention while selecting the borrowers that have the higher probability of successful repayment.

For objective 3

Under objective 3 (Chapter 4), the challenges faced by the lender as well as the borrowers under this study are analyzed and interpreted using the qualitative content analysis technique. In doing so, the study has followed few steps reported by numbers of authors such as Marying (2000), Rabiee (2004), Hsieh & Shannon (2005), Kohlbacher (2006), Elo & Kyngäs (2008), Bengtsson (2016). The steps include:

i) Proof-reading of the notes taken during the interview, listening to the records, summarizing the information from the recorded tapes and reading them repeatedly to be familiarized with the data.
ii) Writing up the memos or short phrases in textual form to develop a thematic framework of the overall interviews.
iii) Highlighting, sorting and coding of the data to make comparisons both within and between the cases to provide a valid inference of the studied context.
iv) Interpretations of the findings based on the consistency, frequency, and reliability of the research questions' answers.

The research framework of the study is summarized and diagrammatically presented in Figure 2 as follows:

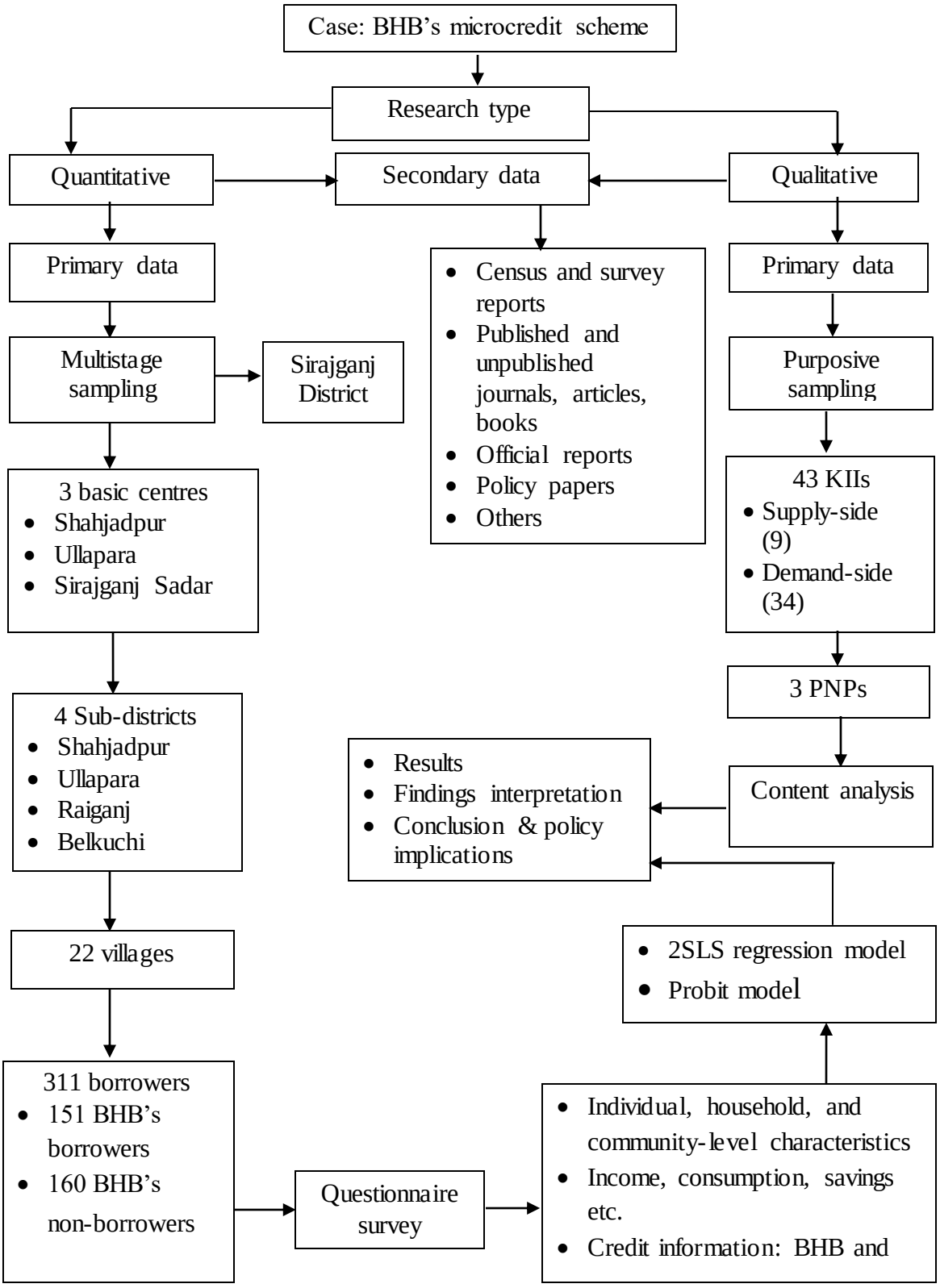

Figure 2: Research framework

Source: Own construction

1.8 Significance and Contribution of the Study

The significance and contribution of the study can be described in the following fronts:

i) The impact estimated in this study is an addition to the on-going controversy on the actual role of microcredit in improving the livelihood. From the handloom weaving perspective, it shows whether microcredit is a good option for entrepreneurship development. Additionally, it fills the knowledge gap regarding the impact of government credit program in promoting the non-agricultural employment. That is how it facilitates the comparison whether the non-agricultural enterprise expansion is typically better served by government or other credit institutions.

ii) As noted in paragraph 3 of section 1.2 and reinforced here, the majority of the impact assessment studies simply ignored the endogeneity problem of the model. Happily, this study can be said to be contributing to this direction as it has addressed the endogeneity problem through the use of 2SLS regression model. Hence, it becomes one of those limited numbers of comprehensive studies (e.g., Pitt and Khandker, 1998, 2002; Rahman et al., 2009; Khandker & Koolwal, 2016) that has dealt with this issue.

iii) The sustainability of the MFIs is said to be one of the foremost consideration for the long-term validity of the program's impact. Through the identification of the beneficiary-specific and institution-specific factors that contribute to the lower repayment rate, this study shows which factors require particular attention in ensuring the sustainability of the public credit program on which literature is quite few.

iv) Another contribution of the study is again justified in light of the scope mentioned by Baqui Khalily (2004). As per the authors, quantitative method is more superior to the qualitative approach. However, for better understanding and more valid causal interference, someone needs to conduct the intensive qualitative study through the case study that should be guided by the econometric estimation. The author also noted the importance of supply-side analysis than the conventional approach of demand-side analysis. In this regards, it can be said that this study is unique as fits in both of the scopes. In one side, it has investigated the impact and repayment quantitatively using a case study. On the other side, guided by the estimated results, it qualitatively attempted to find out why the effects are the way it is calculated taking both the demand-side and supply-side views into account.

v) The use of participatory PNM as the qualitative method in the field of microfinance governance studies is again upheld as the unique contribution of this study. As per the

knowledge of this study, this is the first attempt to analyze the stakeholder's perspective in microfinance studies using this newly developed method.

1.9 Organization of the Thesis

Apart from the introduction Chapter 1, this thesis includes four other chapters where Chapter 2, 3, and 4 are the result-specific chapters of the dissertation. These chapters are organized in a cumulative style. Each of the chapters represents individual articles that have not yet been published. Chapter 2 presents the first article which quantitatively estimates the impact of the selected credit program on the investment status of the borrowers. Followed by insignificant impact estimation in Chapter 2, Chapter 3 identifies the factors that contributed to the lower repayment performance of the borrowers. This estimation acts as the proxy of institutional sustainability analysis. Again, followed by the findings of Chapter 3, Chapter 4 qualitatively examines the challenges faced by the studied institution as well as the borrowers that contributed to the insignificant impact and lower repayment by the borrowers. Finally, the study findings of the three different articles are discussed together in Chapter 5 to highlight the policy implications of the present study.

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2 Assessing the Impact of a Government-funded Non-agricultural Microcredit Program on the Investment Status of the Handloom Weavers in Bangladesh

Abstract

This paper estimates the impact of a non-agricultural government credit program on the investment status of handloom weavers in Bangladesh whereas the Bangladesh Handloom Board (BHB)'s Microcredit Scheme serves as a case. The data were collected from 311 randomly selected handloom weavers from Sirajganj District during 2015. The multistage sampling technique was used to do so. Apart from the BHB's credit access, this study has also incorporated the variable amount of loan received from different formal and informal credit sources by the studied borrowers into the analysis so that a comparison can be made between the BHB's and other credit impacts. The data has been analyzed using the Two-stage Least Squares (2SLS) regression model with Instrumental Variable (IV) to control the endogeneity problem of the selected credit variables. The major finding of the study highlights that access to BHB's credit has no significant impact on the investment status of the borrowers. In addition, the amount of credit received from multiple sources other than BHB significantly and negatively influences the outcome variable. Such insignificant impact has raised several research questions along with the further continuation of the studied credit program that needs to be explored intensely from the policy perspective. Other than the credit variables, the household assets and the number of operational handloom machines significantly and positively influence the outcome. Besides these variables, the magnitude of the variables number of non-operational handloom machines and the distance of Microfinance Institutions (MFIs) from the study villages are estimated as inverse on the outcome. In the end, the study recommends for the revision and reformulation of the government credit policy with several other interventions like market facilitation, infrastructural development, technology adoption and the like for the structural change in the handloom sector in Bangladesh.

Keywords: Non-agricultural, Government Microcredit, Investment, Handloom Weavers, Two-stage Least Squares, Instrumental Variable, Bangladesh

2.1 Introduction

Although Bangladesh is predominantly an agriculture-based country, the poor rural households in this country tend to find their livelihood in the interplay between a mixed economy consisting of farm and non-farm sector. The reason behind such attitude is that agricultural production is always subject to seasonal risks and uncertainties, and cannot contribute towards maintaining a sustainable livelihood. On the contrary, non-agricultural employment helps to reduce such exposure to weather shocks and provide a higher return as compared to agriculture (Reardon et al., 1994, 2000; Pitt, 2000; McNamara & Weiss, 2005; Kaija, 2007; Vandercasteelen, 2011). However, the participation in and growth of small-scale non-agricultural enterprises are constrained by the access to credit and capital markets in many developing countries (Vandercasteelen, 2011; Hohfeld & Waibel, 2013). However, it does not seem to be the case for agricultural households as evidenced by the substantial number of impact assessment studies of different agricultural credit programs (e.g., Pitt & Khandker, 1998, 2002; Foltz, 2004; Petrick, 2004; Latruffe , 2005; Kohansal et al, 2008; Roodman & Morduch, 2014; Islam et al., 2014; Luan & Bauer, 2015; Ferdousi, 2015; Khandker & Koolwal, 2016).

The lack of credit provision acts as a principal impediment for the on-time productive investment decision of poor rural households (Gelos & Werner, 2002; Kohansal et al., 2008; Hertz, 2009; Love and Sánchez, 2009; Ellis et al., 2010; Anyiro and Oriaku, 2011). By assessing numerous survey reports, the World Bank (2004) estimated the extent of credit constraint as over 40%. It also reported that around 80% households hoped to increase their production if they were given the access to input credit. It indicates that the availability and accessibility of credit is an utmost concern for the poor. However, to what extent public credit programs affect the investment behavior of non-agricultural households have not been explored sufficiently in the existing literature.

In the body of literature, many authors (e.g., Fazzari et al, 1988; Elhorst,, 1993; Hubbard, 1998; Gelos & Werner, 1999; Bratkowski et al., 2000; Bond et al, 2003; Love, 2003; Latruffe, 2005; Hüttel et al., 2008) have contributed to stressing the link between the credit market imperfections and its impact on firm/farm level investment. However, these studies have highly focused on the theoretical part of estimating investment equations often using large dataset (having the panel nature) of the large manufacturing firms of developed countries such as Belgium, France, Germany, United Kingdom, Poland, Czech Republic, Hungary and other countries. Even, some of those studies are very old. Therefore, these

findings may not apply to small non-agricultural farms/firms in developing countries like Bangladesh. In fact, the use of household level data is rarely found in the highlighted context.

Moreover, in Bangladesh, impact assessment studies mainly considered the NGO's programs as successful cases (e.g., Pitt & Khandker, 1996, 1998 & 2002; Schreiner, 2003; Chowdhury et al., 2005; Rahman et al., 2012; Khandker & Koolwal, 2016). However, the evidence regarding the similar assessment of the government credit program is not sufficiently found in the literature. Even though the development of the rural non-farm sector is indicated as a priority concern of the Government of Bangladesh (GoB) for poverty reduction and rural development as emphasized in the poverty reduction strategy paper called National Strategy for Accelerated Poverty Reduction II (IMF, 2012), none of the studies are found to test whether or not the policy of government credit to non-agricultural activities would be a good option for the fulfilment of the specified goals. In the international platform, a study by Petrick (2004) is found to assess the role of governmentally promoted credit program on credit rationing and investment. However, the author has done the analysis from the viewpoint of the Polish farmers which is a developed country's analysis and is not the non-agricultural households. Therefore, it can be summarized from the review of these studies that there are limited numbers of studies investigating the impact of public credit on the welfare of non-agricultural households.

From the methodological perspective, it is claimed in line with Pitt and Khandker (1998) that majority of the impact assessment studies mentioned above merely have ignored the endogeneity problems arising from the program's self-selectivity bias. However, many famous authors (e.g., Wooldridge, 2002a & 2002b; Khandker et al., 2010) have reported that that failure to deal with that critical problem results in the inconsistent estimate and weakens the actual impact of a program. Sometimes, the non-randomized program placement also leads to the estimation bias (Khandker et al., 2010). Additionally, Baqui Khalily (2004) and Hasan et al. (2013) emphasized the fungibility criterion of credit use in the face of the low gestation period. According to these authors, when the credit is not utilized productively, it poses the question of how well microcredit improves the livelihood. Therefore, impact estimation of credit is difficult as it requires multiple issues to be dealt with. It also requires an appropriate model that can solve these problems or the use of panel data. In this study, using the 2SLS regression model with IV that has the potential to deal with this issue, this study attempts to estimate the impact of a government credit program on the non-agricultural households following a case study approach. Thus, it is expected to be one of those few

studies (e.g., Pitt and Khandker, 1998, 2002; Rahman et al., 2009; Khandker & Koolwal, 2016) that has dealt with the endogeneity problem.

Against this backdrop, this study aims to estimate the impact of the government-promoted credit program on the investment behavior of the non-agricultural households in Bangladesh. In doing so, it has selected a case called Bangladesh Handloom Board (BHB)'s[17] Microcredit Scheme. The program provides credit as working capital to the handloom weavers[18] who are considered as the potential non-agricultural driver of rural development since the ancient era. The program is being implemented since 1998 and is specialized in the sense that it provides production credit to groups of only handloom weavers other than supporting diverse activities like NGO-led microfinance programs. The purpose of the program is to provide the investment capital required to make the unproductive machines (also called looms or units or devices) as productive, the output of which (i.e., cloth) is the primary income source for the weavers. The credit ranges from 128 to 231 USD[19] per machine depending on the kinds of handlooms[20]. For example, the owners of Chittaranjan loom receive nearly 167 USD whereas Benarosy and Jamdani producers receive 231 USD per loom at a flat interest rate of 10% for 36 months. At a time, a weaver can receive the credit against five of their non-operational looms. Thus, the program aims to increase the business scale so that the program beneficiaries can be socioeconomically self-reliant (BHB, 1998, 2015).

From this context, although it seems to be a convincing approach, without any empirical assessment of the actual impact, it might not be logical to say whether this program is successfully serving its purpose. Although the program is being implemented over the periods of 18 years, to the best of the knowledge of this study, no study has been conducted so far to check the viability of the program. Therefore, selection of this case seems appropriate as it is consistent with the idea of the present study. Thus, it is expected to fill the knowledge gap between the impact of government and non-government and the agricultural and non-agricultural credit programs.

[17] The BHB is a public organization administered by the Ministry of Jute and Textile. It was established in 1977 for performing multiple activities for the development of handloom sector in Bangladesh (BBS, 2003).

[18] Handloom weavers are those whose livelihood is dependent on the handloom weaving occupation. As the name suggest, handloom weaving is referred as the process of producing the woven fabric (i.e. cloth) through the manual exercise of someone's hand and foot. The process requires a machine called loom which is made of wood and iron and is operated without any mechanical power or electricity. For further reading: BBS (2003), Islam and Hossain (2012); Rahman (2013), Rahman et al. (2014).

[19] 1 US dollar = Approximately 78 Bangladeshi Taka (BDT) during December 2015

[20] There are 5 different kinds of handlooms such as Pitloom, Chittaranjan loom, Benarosy loom, Jamdani loom and Kamer/Waist loom (BBS, 2003)

Specifically, the study aims to address the following research question:

i) To what extent BHB's credit affects the investment decision of handloom weavers in Bangladesh?

And, the hypotheses of this study are:

i) BHB's credit significantly affects the investment decision of the studied borrowers.
ii) The socioeconomic indicators either positively or negatively influence the investment decision of the studied borrowers.

Keeping these hypotheses in mind, it is expected that the empirical estimation of this impact will guide the proper allocation of public funds through highlighting various interventions required to facilitate productivity-enhancing activities in rural areas of Bangladesh.

The rest of the paper is organized into five different sections. Section 2.2 presents the methodology of the study with a major highlight on the sampling technique and the analytical method. The hypotheses on the probable impact of the explanatory variables are explained in section 2.3. The results and the discussion are presented in section 2.4 and 2.5. Finally, the conclusion and recommendations are drawn in section 2.6.

2.2 Research Methodology

2.2.1 Database and Sampling Technique

To achieve the research objective, a cross-sectional sample survey was conducted to collect the primary data during July to December 2015 from 311 randomly selected handloom weavers under Sirajganj district of Bangladesh. The multistage sampling technique was employed to do so. In the first stage of the multistage sampling, 3 basic centers (namely Shahjadpur, Ullapara, and Sirajganj Sadar) under Sirajganj district were purposively selected from 30 through which the BHB is implementing its credit program in Bangladesh. According to the latest 'Handloom Census' conducted by BBS (2003), this district is ranked 1st regarding the number of the handloom establishment (p. 28). It holds nearly 14870 handloom weaving units and accounts for 36% of total 50 million meter handloom cloth production within the country (p. 29, 81).

The second stage also involved the purposive selection of 4 sub-districts from 9 in consultation with the head office of BHB. These sub-districts are called Shahjadpur, Ullapara, Raiganj, and Belkuchi. In addition to the easy accessibility, these areas were also

comparatively advantageous for the availability of the significant numbers of studied beneficiaries. The third and fourth stages of the multistage sampling were the random selection of 22 villages and 311 weavers from the credit implementing villages of BHB. Out of total sample, 49% was found to be the credit users of BHB while the rest 51% was the non-users of the BHB's credit. The sample size varied in different study areas.

Finally, the data on the borrowers' socioeconomic status, resource endowment, income, expenditure, savings, and most importantly the credit transactions were collected for the present study. Additionally, the information on the sampled households' access to different formal and informal credit sources other than BHB was also recorded. Besides primary data, secondary data were also collected from the BBS, BHB, different published and unpublished articles, reports, books, and other sources.

2.2.2 Analytical Tool

To estimates the impact of the BHB's credit program on the investment behavior of the handloom weavers in Bangladesh, the 2SLS regression model with IV has been used in this study. The model specification is based on the most cited econometric studies by Wooldridge (2002a & 2002b) and Khandker et al. (2010). The basic structural equation of this model is written as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_i X_i + u \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

Equation (1) is a simple Ordinary Least Squares (OLS) regression equation. In this equation, Y represents the investment expenditure in handloom business (USD), β_0 is the intercept, β_1 is the parameter associated with the binary variable X_1 (i.e., 1 = credit access to BHB, 0 = otherwise), $X_i's$ are the additional individual, household and community level exogenous variables that are also supposed to affect the investment decision, $\beta_i's$ are the parameters associated with $X_i's$ and u is the error term.

This simple OLS model is suitable enough to measure the impact of a program if endogeneity[21] problem is not attached to it. Otherwise, the estimated model will provide inconsistent parameter estimates. In this situation, the model will stand in need to deal with the problem of endogeneity.

[21] Generally, endogeneity is defined as a situation when one or more of the regressors in a classical linear regression model are influenced by the values of the others, thereby causes the correlation with the error term.

In this study, equation (1) is suspected to be composed of the endogeneity problem due to the omission of two unobserved variables from the analysis. Suppose, these two variables are the weavers' attitude towards gaining the economic solvency or the attitude towards confronting the risk and uncertainty associated with the weaving business. Although these two variables have not been directly included in equation (1), they are supposed to encourage weavers' demanding more credit from the credit institutions. Such motivation will have either positive or negative impact on their investment status that is supposed to be attached to the disturbance term. As a result, the zero conditional mean assumption of the error term will fail, and the estimated coefficients of the model will be biased. In order to solve this problem, the 2SLS regression model with IV is selected for the present study among the various possibilities which has the potential to untangle the causality effect of those omitted variables from their suspected correlation with u (Bascle, 2008; Hahn et. al., 2002). Thus, it will solve the endogeneity problem.

Moreover, the equation (1) explains the endogeneity problems associated with a single endogenous explanatory variable (X_1). However, the study calls for expanding the model one step further as it has identified some borrowers having their access to the multiple credit sources (e.g., formal, semi-formal, informal) other than the BHB's credit. The present study is interested to incorporate this variable into the equation (1) to facilitate the discussion whether BHB's credit has much stronger effect on the outcome than any other financial possibilities. If the study denotes the amount of credit received from other credit sources as X_2 and incorporates it in equation (1), the structural model would be as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_i X_i + u \qquad (2)$$

In this equation (2), β_2 is the parameter of the second endogenous variable X_2. Theoretically, variable X_2 is also endogenous like variable X_1 due to the omitted variables explained above. It will cause X_2 to be correlated with the error term resulting in undetermined effect of the equation (2).

As equation (2) has two endogenous variables, at this point, the study has to find either equal or greater number of suitable instruments for both endogenous variables as required by the 2SLS regression model. However, this is a complicated task for the researchers as the instruments need to satisfy the following conditions:

i) Uncorrelated with the error term
ii) Correlated with the endogenous regressors ……………………………… (3)

Suppose that the dataset of this study has two observed exogenous variables that can be used as instruments for X_1 and X_2. If these instruments are represented by Z_1 and Z_2 where Z_1 is the instruments for X_1 and Z_2 is the instrument for X_2, the next step of 2SLS is to state the relationship of these instruments with X_1 and X_2 in terms of partial correlations between them. Equation (4) and (5) represents such relationship where the endogenous variables are expressed as as a linear function of the instruments and X_i and an error term v. These equations are termed as the reduced form equations of X_1 and X_2 and are expressed as follows:

$$X_1 = \eta_0 + \eta_1 Z_1 + \eta_i X_i + v \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (4)$$

$$X_2 = \delta_0 + \delta_1 Z_2 + \eta_i X_i + \varepsilon \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (5)$$

Where, $\eta_0, \eta_1 and\ \eta_i$ are the unknown parameters to be estimated for equation (4) and $\delta_0, \delta_1, \eta_i$ are the parameters for equation (5). v and ε are the error terms of the following equations.

The next step of 2SLS regression is to define those linear combinations of instruments which are strongly correlated with variables X_1 and X_2. Suppose that such variables are $X_1{}^*$ and $X_2{}^*$, then their relationships is expressed as follows:

$$X_1{}^* = \eta_0 + \eta_1 Z_1 + \eta_i X_i \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (6)$$

$$X_2{}^* = \delta_0 + \delta_1 Z_2 + \eta_i X_i \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (7)$$

To get the first stage results, equations (6) and (7) are regressed to find the predicted values of $X_1{}^*$ and $X_2{}^*$. If these predicted values are represented by $\hat{X}_1$ and $\hat{X}_2$, the final model of 2SLS is founds as follows:

$$Y = \beta_0 + \beta_1 \hat{X}_1 + \beta_2 \hat{X}_2 + \beta_i X_i + u \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (8)$$

Where, X_i's are those exogenous explanatory variables that was used in the first stage estimation of equation (4) and (5), and u is the error term after controlling for the correlation with the endogenous variables. Estimation of equation (8) by 2SLS model with IV is expected to provide the consistent estimates than OLS.

2.3 Description of the Variables Used in the Model Estimation and the Hypothesis on Their Probable Effects

2.3.1 Dependent Variable

The outcome variable (Y) of this study is the amount of money invested on the handloom business by the sampled credit users and non-users during 2015. Reardon et al. (2000) elucidated that investment is an important policy concern in developing countries as it helps to remove the entry restriction to non-farm employment opportunities. Therefore, it is believed in this study that credit access will facilitate entrepreneurship development through increased business scale resulting from the higher investment ability of the borrowers.

2.3.2 Endogenous Variables

The endogenous variables of the study are the access to BHB's credit (X_1) and the loan size received from credit sources other than BHB (X_2). The second is used as the basis of comparison between X_1 and X_2. The first variable is binary in nature whereas continuous nature has been employed for the second variable. Irrespective of the nature of the variables, the literature reviews (e.g. Gelos & Werner, 2002; Petrick, 2004; Love and Sánchez, 2009, Kohansal et al., 2008; Hohfeld & Waibel, 2013) suggest that these variables can have positive, negative or unrelated impact on farm, off-farm or industrial/manufacturing investment. Bearing that in mind, this study hypothesis that BHB's credit access will have a significant positive impact on the outcome of interest. Even though the credit received from multiple sources by the BHB's beneficiaries is regarded as a theat to the studied case, it might be beneficial for some while non-beneficial for others. Therefore, this study expects an dubious impact for the second endogenous variable.

2.3.3 Exogenous Variables

Apart from the endogenous variables, 12 different exogenous regressors have also been used in the model estimation of which 2 of them acts as instruments. These variables are discussed as follows:

Age: The age of the borrowers is a significant determinant of their economic decision making taking advantage of experience and responsibility (Ibrahim, 2013). It also determines the credit eligibility. The risk-taking behavior, as well as the physical strength of the younger

borrowers, are likely to contribute to investing and earning more and vice versa (Luan, 2015). Therefore, this study suspects to get a positive coefficient for this variable.

Education: An educated person gets the credit access more easily and can manage their business more successfully than their correspondent (Ibrahim, 2013; Luan, 2015). Therefore, it is hypothesized that such ability will positively encourage the borrowers investing in their occupation.

Family size: Authors such as Serra et al. (2004) and Hohfeld and Waibel (2013) have identified this variable as a significant determinant of households' investment decision. Many others (Ibrahim, 2013; Luan, 2015) preferred to consider this variable as the potential of laborers. From the study context, it can be explained as that handloom weaving is a labor-intensive job. Being a manually operated production practice, the borrowers require at least one labor to run each machine. A large family size can be of benefit in this regard which will help them in reducing the cost of hired labor and investing that amount in their business. Thus, it is expected to have a tempting correlation with the outcome variable.

Farm size: This variable acts as an indicator of wealth position for the small and marginal farmers in many developing countries. In credit cases, it is also seen as a factor of higher repayment ability (Petrick, 2004; Ibrahim, 2013; Hohfeld and Waibel, 2013; Ghimire et al., 2014 and Luan, 2015). However, it is assumed by this study that the households with a significant proportion of land holding may prioritize agricultural investment over non-agricultural such as handloom weaving. Therefore, this variable is expected to leave an inverse effect on the estimated model.

Working experience: The experience of operating a business as an entrepreneur is hypothesized to be proportional to the present and future investment decision such that an experienced person can make a rational decision regarding when, where and how much to invest. Therefore, the expected sign for this variable is positive for the analysis.

Household asset: The level of a household asset measured in the present market value of all the household items represents the wealth status of a family (Luan, 2015). Diagne and Zeller (2001) and Hohfeld and Waibel (2013) reported that the wealthier households are likely to invest more which helps to expand the microenterprises in the absence of a perfect credit competition. Based on this premise, the study assumes that the more the value of the household asset, the higher the chance of investment in weaving business.

Number of the operational machines: For the studied borrowers, their level of investment varies according to the number of functional devices available within the household. An addition of a unit increases the investment requirement and vice versa. A positive connection is expected to be obtained by the model estimation.

Number of the non-operational machines: The effect of this variable on the outcome can be explained in the opposite fashion of the variable operational machine. An increase in this number implies the weaver's insufficient financial liquidity to operate the business. As a result, investment requirement will be reduced. On the other hand, it may prove the ineligibility in repaying the credit by the borrowers. Thus, it will restrict the weavers to have their credit access and consequently, investment will be lower. Whatever the reasons are, an inverse relationship is expected to be determined by the model.

Purpose of loan utilization: Investment is thought to be proportional to credit only if it is utilized for productive purposes. Otherwise, the impact will be different. Baqui Khalily (2004) and Hasan et al. (2013) also emphasized the same while explaining the issue of credit fungibility (see section 2.1). With that conception, a binary variable has been employed for the present study where value 1 has been assigned to those who utilized their credit for the purpose mentioned above. Hence, it is suspected to have a substantial positive effect on the dependent variable.

Distance from MFI: Distance is a community level factor that is expected to negatively influences the households' investment choice. Ibrahim (2013) noted that this variable involves higher transaction cost while collecting the credit from an institution far away from the borrowers' locality. Thus, it reduces the marginal value of credit and consequently the investment level.

2.3.4 Instrumental Variables

Membership in Weaver Organization (WO): The first instrument of the study (Z_1) is the status of membership in the WO. This variable is binary in nature representing one for those borrowers who had access to this organization and zero for others. The incorporation of this variable as an instrument is supposed to be rational as it is one of the eligibility criteria for BHB's credit program. If an individual is identified as an active member of this group, he is considered as more responsible in repaying his credit obligation. Thus, it increases the possibility of getting the credit. For those who has already repaid, it increases their second chance. That is how it is supposed to be correlated with the endogenous variables X_1 which

can have some partial effect on Y but is not correlated with the omitted variables considered in the model specification.

Number of credit received from multiple sources: The second instrument (Z_2) is the number of credit received by the sample respondents from different formal and informal sources except BHB during 2015. This variable is supposed to act as a good instrument for X_2 as the loan volume obtained depends on the number of loan taken from these sources, thereby, implies the correlation between them. Theoretically, it is not supposed to have any connection with the omitted variable. Thus, it is also assumed to satisfy the conditions mentioned in equation (3).

Finally, it is important to note that a natural logarithm is used to transform most of the continuous types of socioeconomic variables to obtain their standard distribution. Although many studies have found a positive and significant relationship of the variables like income, expenditure, and savings with the investment decision of households, they are also supposed to be endogenous due to the diverse factors associated with their measurement. Therefore, this study has excluded them from the current analysis so that the complexity arising from more than two endogenous variables is avoided.

2.4 Results of the Study

The results of the study are sub-divided into three sub-headings. At first, the descriptive statistics of the variables used in the current analysis is described followed by the first stage regression statistics that determined the credit access to BHB and the amount received from other sources. At last, the final result of the study is presented which identifies the impact of the studied credit program along with other determinants.

2.4.1 Descriptive Statistics of the Variables Used in the Model Estimation[22]

The descriptive statistics of the selected variables are divided into two categories as continuous and binary for the convenience of their presentation and are summarized in Table 1 and Table 2. In the beginning, it is also important to categorize the sampled borrowers so that the comparison between them can be explained easily. Table 2 highlights that out of total 311 sampled borrowers, nearly 49% had access to the studied case. Therefore, they are regarded as the credit users of BHB whereas the rest 51% were the non-users and are considered as the comparison group for the rest of the paper. However, the available and latest 'Handloom Census 2003' shows that out of total 32126 handloom establishment who received credit during 2002-2003, only 10% received it from BHB (BBS, 2003, p. 89). This estimate implies that over the periods of 12 years (as of December 2015), the borrowers' access to BHB's credit has increased substantially.

The first demographic variable of the study is the age of the borrowers. The study finds that the mean age of the total respondents was nearly 44 years at the date of the survey which represents the working age as per Ibrahim (2013) and Luan (2015). However, no significant difference is observed among the credit users and non-users of BHB.

Unfortunately, the level of education is found to be very low for the total sampled borrowers covering an average of 4.45 years in primary school. The average literacy was 4.68 years for the comparison group which was slightly higher than the credit users having 4.23 years of schooling. This estimation shows that there is no significant difference between the literacy level of treatment and control group. This figure is quite frustrating that calls for some policy to motivate the borrowers and their families' attaining higher education.

[22] In this section, some of the figures reported from BBS (2003) are the author's own calculation and conversion from the real figure.

Furthermore, the study observes a mean family size of 5.36 which was higher than the national average of 4.50 as per the 'Household Income and Expenditure Survey (HIES) 2010' (BBS, 2010). This number (5.41) was slightly higher among the non-users. However, no mentionable difference is observed between the groups.

Even though farming was not the primary occupation for the handloom weavers, they owned an average of 0.41 acre of land including their dwellings. This figure indicates the marginal farmers' category in Bangladesh (BBS, 2010) whereas no visible difference is estimated between the groups.

The borrowers are extensively experienced in their traditional occupation having an average of 22 years of work involvement. However, credit users of BHB were more experienced (23.62 years) than their counterpart (20.45 years) as evidenced by the statistically significant difference estimated between the groups.

Further economic estimation shows that the borrowers' average asset value was equal to 2,452 USD. Although the significance test proofs that there was not much difference in the asset values of the groups, the Table 1 represents that BHB's credit users were better than the non-users.

Per borrower was making their livelihood using an average of more than 5 number of their operational handloom devices on which they had to invest more than 11,077 USD on an average. These figures are higher than the national average of 1.7 and 344 USD (approximately) as per the 'Handloom Census 2003' (BBS, 2003, p. 25, 84). However, this number for the Sirajganj district was average to 6.7 which is higher than the estimated number (BBS, 2003, p. 29). Even though in both of the indicators, the credit users were slightly better than the credit non-users of BHB, these differences are not statistically significant between the groups.

Apart from those productive machines, per borrower had nearly 3 of their handloom devices as unproductive during the survey period due to either the technical problems or lack of finance. This number was significantly higher among the non-users of BHB's credit (3.36) than the users (2.40) as proved by the statistical test having 5% level of significance. This number is also higher than the national average of 1.1 occupied by each weaver (BBS, 2003, p. 32).

For those who had access to multiple credit sources other than BHB received an estimated average of 487 USD as credit for which they had to request nearly 4 times in a year. Even

though the non-users demanded credit more times, they received less amount (approximately 375 USD) as compared to the credit users (about 606 USD). Such difference between their requirements is statistically significant having a p-value of less than 0.05. Once again, 90% of total 32126 handloom establishment received credit from different banks and non-banks during 2002-2003 other than BHB. On an average, each establishment received approximately 268 USD as credit from these sources (BBS, 2003, p. 89, 93). This figure indicates that weavers credit requirement has increased almost double since then to December 2015.

Moreover, both the groups had to travel an average distance of nearly 6 kilometers to obtain those credits. The majority of the borrowers (68.49%) utilized the loan for their production purpose instead of household consumption (Table 2). However, these two estimates do not show any statistical difference.

Finally, for the BHB's credit recipients, the membership in WO is seen as a determining factor of credit access as almost 100% of the respondents were holding the membership in the group. On the contrary, this seems not to be the case for the non-users as this figure is estimated at only 45.63%. Such discrepancy has resulted in a highly significant difference between the groups with a p-value of less than 0.01.

Table 1: Descriptive statistics of the selected continuous variables used in the 2SLS model estimation categorized by the study groups

List of continuous variables	Total sample (N=311)	Credit users (N=151)	Credit non-users (N=160)	T-statistic	Probable influence
	Mean (std.)	Mean (std.)	Mean (std.)		
Investment in weaving business (USD)	11,077.36 (9,044.98)	11,367.81 (9,357.32)	8,239.19 (8,760.60)	-0.54	
Age of the respondents (years)	43.94 (12.62)	44.34 (11.71)	43.55 (13.45)	-0.55	+/-
Literacy level of the respondents (years of schooling)	4.45 (3.69)	4.23 (3.85)	4.68 (3.53)	1.09	+
Family size (No.)	5.36 (2.06)	5.3 (1.62)	5.41 (2.41)	0.46	+
Farm size (acre)	0.41 (1.09)	0.39 (0.39)	0.42 (1.34)	0.21	-
Experience of handloom weaving (years)	21.99 (13.28)	23.62 (12.00)	20.45 (14.25)	-2.12**	+
Present value of all households assets (USD)	2,452.29 (2,310.32)	2,604.30 (2,847.70)	2,308.82 (1,647.29)	-1.13	+
No. of operational machine	5.11 (3.39)	5.12 (3.55)	5.09 (3.24)	-0.13	+
No. of non-operational machine	2.89 (4.05)	2.4 (3.25)	3.36 (4.65)	2.08**	-
Distance of MFIs from the commune (in Km)	5.76 (4.05)	5.75 (5.08)	5.77 (5.03)	0.06	-
No. of loan received from sources other than BHB (no.)	3.62 (4.36)	3.07 (2.99)	4.14 (5.30)	2.18**	+/-
Size of loan received from sources other than BHB (USD)	487.24 (501.24)	606.01 (540.81)	375.14 (433.44)	-4.16***	+

Figures in the parenthesis indicates the standard deviation, *** p<0.01, ** p<0.05, * p<0.1,

Source: Field data, 2015

Table 2: Descriptive statistics of the dummy variables used in the 2SLS model estimation categorized by the study groups

List of dummy variables	Total sample (N=311)	Credit users (N=151)	Credit non-users (N=160)	T-statistic	Expected sign
Access to BHB's credit (dummy: 1 = yes, 0)	Yes = 49% No =51%	Yes = 100%	No = 100%		+/-
Purpose of loan utilization (dummy: 1 = productive, 0)	Yes = 68.49% No = 31.51%	Yes = 68.21% No = 31.79%	Yes = 68.75% No = 31.25%	0.10	+
Membership in WO (dummy: 1 = yes, 0)	Yes = 71.38% No = 28.62%	Yes = 98.68% No = 1.32%	Yes = 45.63% No = 54.37%	-12.73***	+

Source: Field data, 2015

2.4.2 Results of the First-stage of the 2SLS Regression Model

Using "ivregress" command in STATA 12, the study has obtained both the first-stage and second-stage results. In the first-stage, the model has run simple OLS regressions on X_1 and X_2 incorporating both instruments and all other exogenous variables. Thus, it has purified the correlation of the omitted variables from the model and has identified the determinants of credit access to BHB (X_1) as well as the credit volume obtained from other institutions (X_2). As X_1 is binary in nature, the model runs the Probit model for the first endogenous variable while for X_2, simple OLS is conducted. Using the purified predicted values of X_1 and X_2 from the first stage, finally, the study estimates the credit impact of the studied programs in the second stage. Therefore, the study, at first, proceeds by shortly explaining the result of the first-stage presented in Table 3.

Table 3 highlights that for both the credit cases (i.e., variable X_1 and X_2), three variables jointly and a variable separately influenced the household's choice of participation to the studied credit facilities. For the first case, the borrowers' existing number of non-operational machines and number of loan received from sources other than BHB are found to be significant at 1% and 5% level of significance respectively with a negative sign. On the other hand, membership status in WO is found to be highly significant at 1% level of significance which indicates the fit of this instrument for X_1. These results are quite obvious as per the justification stated in section 2.3.3 and 2.3.4. Hence, it satisfies the condition that the instrument is correlated with the endogenous variable.

The variables that jointly determined the credit access to comparison group, the number of loans received from different sources than BHB is found to have the positive sign as opposed to what the study estimated for variable X_1. This finding is also possible as the amount received from multiple sources is proportional to the number of loan approved. Thus, it also proofs the instrumental relevance for X_2. For X_2, the other two common variables such as the number of non-operational machines and the membership status are found to have the similar influence like X_1 with P-values of less than 0.1 and 0.05.

In addition to these standard variables, the borrowers' literacy level is identified as significantly and negatively determining their choice of loan obtainment from different sources. This result implies that the borrowers having an additional year spent in the schools will not demand credit from multiple sources. This finding is consistent with Feder et al. (1990) while it contradicts with Anyiro and Oriaku (2011).

Table 3: First-stage estimation results of the 2SLS regression model

Independent variables	First-stage for X_1		First-stage for X_2	
	Coefficient	Std.	Coefficient	Std.
Log of age (years)	0.04	0.08	-0.51	0.69
Log of literacy level (years of schooling)	-0.02	0.03	-0.44**	0.20
Log of family size (no.)	-0.02	0.07	0.00	0.54
Log of farm size (acre)	-0.00	0.02	0.02	0.16
Log of experience (years)	0.02	0.03	0.20	0.24
Log of present value of all households assets (USD)	0.05	0.04	0.37	0.33
No. of operational loom	-0.01	0.01	-0.06	0.06
No. of non-operational loom	-0.02***	0.01	-0.08*	0.05
Purpose of loan utilization (dummy: 1 = productive, 0)	-0.02	0.06	-0.40	0.44
Distance of MFIs from the commune (in Km)	-0.01	0.01	-0.06	0.08
Membership in WO (dummy: 1 = yes, 0)	0.63***	0.05	0.99**	0.41
No. of loan received from sources other than BHB (no.)	-0.01**	0.01	0.24***	0.04
Constant	-0.51		0.55	
Observations	311		311	
F (12, 298)	15.08***		4.59***	
R-squared	0.38		0.16	
Adjusted r-squared	0.40		0.12	

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

Source: Field data, 2015

2.4.3 Results of the Second-stage of the 2SLS Regression Model

The second-stage result of 2SLS regression model reveals that five variables significantly affected the investment status of the handloom weavers in Bangladesh during 2015. It would be worth noting that mostly the variables that determined the credit accesses of the sampled borrowers did not determine the level of investment except the variable number of non-operational machines. This result means that this variable is equally important for both stages. For some variables, the coefficient sign obtained through this analysis is found to be consistent with some past literature while for others; it is either contradictory or undetermined. These results are presented in Table 4 and are discussed as follows:

Unlike the prior expectation, this model summarizes that those borrowers who decided to participate in the BHB's credit program did not get any benefit on their investment due to their participation decision. This result is deplorable as the estimated coefficient is not statistically different from zero. The more reasonable explanation of this impact would be the smaller sized loan than what was required by the borrowers for operating a machine.

In contrast to BHB's credit impact, the borrowers access to different formal and informal credit sources also shows the disappointing result with a highly significant ($p<0.01$) coefficient having a negative sign. In addition to the lower loan volume judgment, another plausible explanation of such impact would be the easy entry and exit criteria of these institutions which facilitated the individuals' self-selection into the program. Such tendency might have arisen from the non-randomized program placement. Whatever the reasons are, it undermines the program's performance.

Both of the credit impacts can be judged in line with Diagne and Zeller (2001) such that borrowers become worse-off after repaying their actual loan obligation with interest which results in such insignificant and negative impact.

The asset position is found to have a high positive impact on the borrowers' decision regarding investment. The coefficient being significant at 1% level of significance confirms exactly what the study assumed earlier. It suggests that borrowers with better economic status can purchase adequate raw materials of production than others.

The correlation between the variables number of operational and non-operational machines and the investment outlay is quite clear from the coefficients signs estimated by the model. The positive dependence of the operational machines implies that an increase in the number

of these units significantly increases the borrowers' expenditure on handloom business. On the contrary, a unit increase in the non-operational machines results in precisely the opposite impact. Both the variables are estimated at 1% level of significance, thus proofs the study assumptions stated earlier in section 2.3.3.

The estimated significant impact of the distance variable is also straightforward and is in line with the hypothesis of this study narrated previously in section 2.3.3. The negative sign implies that an additional kilometer increase in the distance between the MFIs and the studied villages decreases the investment by the borrowers on their business. Such impact might have been estimated due to the increase in the transaction cost while traveling between these two places as noted by Ibrahim (2013). This distance, in fact, constrains the borrowers having their access to the credit facilities. Consequently, respondents lack the adequate liquidity to run their business, thereby, invest less.

Apart from those significant variables, all other variables are estimated as insignificant for the intended analysis. Among them, educational attainment and the work experience of the studied borrowers are found to have a positive sign. These results imply that even though these variables are not significant, hence, the borrowers might benefit from an increased level of these variables. Therefore, the focus should be given to the proper use of these factors. On the other hand, almost all the demographic variables such as age, education, family size, farm size, and the loan utilization purpose reveal a negative sign. Therefore, they require less focus from the policy perspective in the similar kind of analysis.

Table 4: Second-stage estimation results of the 2SLS regression model

Explanatory variables	Estimated coefficient	Standard deviation
Access to BHB's credit (dummy: 1 = yes, 0)	0.14	0.12
Size of loan received from sources other than BHB (USD)	-0.09***	0.03
Age of the respondents (years)	-0.11	0.12
Log of literacy level of the respondents (years of schooling)	0.02	0.04
Family size (number)	-0.02	0.10
Log of farm size (acre)	-0.01	0.03
Experience of handloom weaving (years)	0.04	0.04
Log of present value of all households assets (USD)	0.25***	0.06
Operational loom (number)	0.18***	0.01
Non-operational loom (number)	-0.03***	0.01
Purpose of loan utilization (dummy: 1 = productive, 0)	-0.04	0.08
Distance of MFIs (Kilometer)	-0.03*	0.02
Constant	10.72***	0.81
Observations	311	
Wald Chi^2	542.51***	
R-squared	0.62	

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

Source: Field survey, 2015.

2.4.4 Post-estimation Results of the 2SLS Regression Model

Several tests were conducted after running the 2SLS regression model to determine the best fit of the model as suggested by the Wooldridge (2002b), Stock and Yogo (2002), Khandker et al. (2010), and Mayoral (2015). These tests, in fact, test whether the instruments used in the model satisfy the conditions stated in equation (3). The econometric software package "STATA" provides the basis for conducting these post-estimation tests. The results are presented in Table 5 and are described as follows:

2.4.4.1 Test of Endogeneity

The 2SLS regression model is proved as less precise and less efficient than OLS if the theoretically explained endogenous explanatory variables are proved as exogenous. Therefore, the endogeneity of variables X_1 and X_2 is tested in this study. If the estimated test statistic is not found to be significantly different than zero, it implies the presence of exogeneity of the variables X_1 and X_2, thus proofs the inconsistency of the estimated model. Having such knowledge, the test was conducted using the "estat endog" command in STATA 12. The test reported Durbin Chi-squared score of 6.01 and Wu-Hausman score of 2.84 both of which were significant at 5% level of significance. Therefore, this study rejects the null hypothesis and concludes that the theoretically explained variables were actually endogenous in this analysis.

2.4.4.2 Test of Instrumental Relevance

The second test was the weak instrument identification test or the test of instrumental relevance. According to Stock et al. (2002), Stock and Yogo (2002) and Hahn et al. (2004), if the instruments are weakly correlated with the endogenous variables, it is suspected to provide very smaller coefficient value for some variables, and hence, their interpretations are supposed to be misleading. Therefore, Wooldridge (2002b) suggested testing the fits of first-stage regressions on the endogenous variables by OLS. In STATA 12, "estat firststage" command was used to conduct this test which provided the first stage "minimum eigenvalue statistic" of 19.58. This score was sufficiently larger than the critical values of "2SLS size of nominal 5% Wald test" and "LIML Size of nominal 5% Wald test" shown at different tolerance level during analysis. It implies that the instruments used in the model estimation are strongly correlated with the endogenous variables. Thus, it proofs the instrumental relevance. The test also provided Shea's partial R^2 and Shea's adjusted partial R^2 for both X_1

and X_2 separately (Table 5). For X_1, Shea's partial R^2 score of 0.36 implies that 36% variation in X_1 that is orthogonal to $X_i's$ can be partially explained by the predicted values of X_i. On the other hand, Shea's adjusted partial R^2 score equals 0.13 implies that the degrees of freedom adjustment if new instrument is added in the model. Similarly, these values was estimated at 0.34 and 0.10 respectively for X_2.

There is another test called the test of overidentifying restriction. It is conducted only if the model contains the number of instruments that exceed the number of endogenous variables used in the study. As the study had an equal number of instruments and endogenous variables in the current analysis, it was not possible to conduct this test. Overall, it can be said that 2SLS regression model with IV is the best fit for estimating the actual impact of a credit program as proved by this estimation.

Table 5: Post-estimation results of the 2SLS regression model with IV

Test of endogeneity	
Durbin (score)- value of Chi^2 (2)	7.16**
Wu-Hausman F(2,296)	3.49**
First stage regression statistic	
Shea's partial R-square for X_1	0.36
Shea's adjusted partial R-square for X_1	0.13
Shea's partial R-square for X_2	0.34
Shea's adjusted partial R-square for X_2	0.10
Minimum eigenvalue statistic-F value	19.58

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

Source: Model estimation

2.5 Summary and Discussions

This paper assesses the impact of government-funded non-agricultural credit program in Bangladesh. In doing so, it has selected a case called "BHB's Microcredit Scheme." The program provides credit as working capital to the handloom weavers who are regarded as the potential non-agricultural households in Bangladesh. The main purpose of the program is to improve the socioeconomic conditions of the weavers by making their non-operational machines as operational using credit. Therefore, the primary data for this study was collected from 311 randomly selected weavers from the credit implementing villages of BHB who had the similar socioeconomic background. Among the total sample, 49% has been identified as the credit users of BHB while the rest 51% is considered as the non-users of BHB's credit, thus, serves as the comparison group for this study.

The study has used a 2SLS regression model with IV for estimating the impact of the study focus. Rather than solely determining the effect of BHB's credit, the study has also evaluated the effect of the loan amount received from different formal and informal credit sources other than BHB as a measure of the borrowers' accesses to these sources. The incorporation of this variable has facilitated the comparison between the potential roles of government (formal) and NGOs (semi-formal) credit programs in serving their purposes. Both the variables of the study interest are endogenous due to the omitted variable bias, which called for the use of the model mentioned above. Other than the credit variables, a set of individual, households and community level variables have also been included in the model where the two of them have acted as the instruments for this study. Moreover, the model has displayed the information on two fronts. First, it has displayed the result of those variables that determined the household's access to BHB and other credit provisions. Secondly, it has identified the factors that influenced the households' investment decision after controlling the correlation of the omitted variables from the error term using the first-stage estimated values of all the exogenous explanatory factors of the model.

Even though the first-stage result is not the primary focus of this study, yet, the model has identified three common variables that have significantly determined the likeliness of the borrowers to participate in the specified credit programs. These common variables are the number of non-operational machines per household, their membership status in the groups of WO and the number of credit received from different sources except BHB. It is noted that the second and third variables act as the instruments for the analysis. The highly significant relationship of these two instruments with the endogenous variables preliminarily implies the

correctness in selecting them as instruments for the analysis. Moreover, the variables non-operational machines and membership status has the same sign for both endogenous variables whereas the sign of the variable number of loan received is completely different. These estimated coefficient signs are exactly what the study expected to get for this analysis. Surprisingly, borrowers' literacy level has the negative impact on loan size received from different sources. This result is quite surprising as the study hypothesized for a positive dependence between these two variables. At the end of the first-stage, some of the study findings are not supported by the past literature as no study is found to use these variables in their analysis. For the membership variable, the study does not find any consistency with Diagne and Zeller (2001) and Anyiro and Oriaku (2011) as the former authors estimated a significant negative dependence with credit access while the following authors estimated an insignificant relationship.

The result of the second-stage of 2SLS is the critical concern of this study. The most critical estimation highlights a very disappointing result for both the credit cases under consideration. More clearly, none of the credit programs is found to have an appealing impact (i.e., X_1 is insignificant, and X_2 is significantly negative) on the investment status of the borrowers. The more plausible explanation of such results would be the lower volume of credit received from these sources than the requirement of the borrower. This fact is relatively clear even from the descriptive analysis part (Table 1). The table reveals a significant gap on the amount invested on handloom business and the amount received from different sources. As this variable has binary nature in this analysis, how much the borrowers received from BHB is not shown in the current analysis. However, it can be assumed from section 1 where the study mentioned that the credit limit of the BHB's program is between 128-231 USD. If that is so, several questions arise: from where the borrowers are getting their required money for investment? Do the borrowers need microcredit or microenterprise credit or any other support measures such as subsidized credit or cash transfer from the government? Why the BHB's credit program is still being implemented? Does the credit program aim foster the structural change in investment or it is merely a show-off initiative that something is being done for the development of the handloom sector in Bangladesh? All these answers need to be explored intensely through further research.

Another reason for such credit impact would be the self-selection bias due to the non-randomized program design. It means that the program may have deliberately targeted the borrowers who do not need credit at all. Without such preliminary assessment or poorly

assessed program is expected to bring such inconsistent impact. Whatever the reasons are, these facts require considerable attention from the policy perspective. This finding is consistent with Kohansal et al. (2008) and Hohfeld and Waibel (2013) whereas it contradicts with the findings by Gelos & Werner (2002), Petrick (2004), Love and Sánchez (2009) as these authors estimated a positive dependence between the dependent and independent variables of the study interest.

In addition to the credit variables, the results provide evidence that non-agricultural investment is dependent on four other variables. The household asset values and number of operational machines positively favors the outcome. On the other hand, the implications of the number of non-operational machines as well as the distance variable are against that view. These results are quite straightforward as per the assumption of the study. Moreover, the results of household asset and distance variables are in line with Serra et al. (2004) and Chauke et al. (2013).

All other variables are estimated as insignificant for both the first and second-stage of 2SLS model. Therefore, they do not require much attention from the policy perspectives. However, the variables that have positive magnitude, a unit change may result in beneficial impact for investment decision, although it cannot be assured. The use of some unique variables associated with the handloom weaving does not allow the study to find the consistency with past or recent literature. It is expected that this study will guide the policy planners in preventing the misuse of public fund, thereby, implementing successful credit program for the development of handloom sector in Bangladesh.

2.6 Conclusion and Policy Recommendations

Despite the commencing emphasis of GoB in promoting the non-agricultural entrepreneurship through strengthening the rural credit market, the relatively irrelevant extent of investment has implications for the further continuation of the government credit programs, in particular, BHB's microcredit scheme. In this situation, the question that comes in front is whether the studied credit program attempts to improve the livelihood of the handloom weavers in Bangladesh or it is just a social support measures from the government? If the latter is true, it needs to have a clearly-defined goal to guide the researchers and development partners. It is possible by revising and reformulating the policy both within and outside the current framework following the randomized program placement criteria. Finally, the study recommends several government interventions not necessarily by means of credit, but by the

initiatives of market facilitation, infrastructural development, import tax reduction on the raw materials and the like. Technology adoption could be another option for the structural change from the handloom to power loom. It is obvious that in the current era of modernization, the manually operated production system is no longer able to compete with technologically produced products. Therefore, the credit would be an execellent option to facilitate this structural change only if it is provided in a more extensive volume or in a subsidized manner. Otherwise, lending continuation in smaller amount will foster the household consumption rather than productive investment.

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2.9 Disclosure Statement

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3 Factors Determining the Repayment Performance of a Government-funded Non-agricultural Microcredit Program for the Handloom Weavers in Bangladesh

Abstract

This study explores the sustainability of the government credit program in Bangladesh with regard to examining the factors affecting the repayment performance. In doing so, a quantitative case study approach was followed whereas Bangladesh Handloom Board (BHB)'s microcredit scheme served as a case. The cross-sectional data for this analysis were collected from 151 credit beneficiaries of BHB under Sirajganj district during 2015. These credit beneficiaries are popularly called the handloom weavers and are regarded as the rural non-agricultural households. Moreover, the multistage sampling technique was employed to collect the primary data. The findings of the Probit model estimation reveals that several socioeconomic factors like households' active family members, operational handloom machines, the loan size, and the productive loan utilization positively and work experience, occupational status, income, and distance variables inversely influences the borrowers' successful repayment choice. Finally, the study recommends for the policy that is important from the lenders' perspective to cover up the gap in loan repayment so that the sustainability of the organization is ensured.

Keywords: Repayment performance, Non-agricultural, Government-funded credit program, Bangladesh Handloom Board, Handloom Weavers, Probit model

3.1 Introduction

Bangladesh is recognized as the pioneering country of microfinance. It started its journey during the 1970s with Muhammad Yunus, who is considered as the founder of the modern concept of 'microfinance' through the establishment of Grameen Bank (GB) for which he was awarded a Nobel Peace Prize in 2006. Since its inception, microcredit is serving as an intervention tool for empowering the rural poor by facilitating small-scale entrepreneurship and reducing poverty. In recent years, it has gained policy attention in most of the Asian, African or Latin American countries (Sharma and Zeller, 1997; Afolabi, 2010; Siwale and Ritchie, 2011).

The availability of credit service to the rural poor and its potential in improving the livelihood cannot be stated in few words (Ahmed, 2009). Therefore, an enabling and sustainable credit service is the priority concern of the policymakers in the developing countries (Papias and Ganesan, 2009). Financial profitability and sustainability are also two interrelated issues which validate the effectiveness of the Microfinance Institutions (MFIs) (Baqui Khalily, 2004). Authors such as Moreno (2004) and Anignogu et al. (2014) noted that the financial sustainability of the MFIs is determined mainly by the higher repayment record. Though many of the microfinance programs in the developing countries have already been successful with regard to this indicator, this case is not unique for all MFIs (Kono and Takahashi, 2010; Haile, 2015). The default case is more prominent to the government-funded credit programs as compared to the Non-government Organization (NGO)'s ones (Sharma and Zeller, 1997; Kamanza, 2014). As for example, the rates of repayment defaults of the two government-operated youth and women unemployment solving credit programs in Kenya can be mentioned. Njangiru et al. (2014) claimed that these rates were 40% and 50% respectively for those mentioned credit programs.

Several reasons can be put forth for the failure of public programs. Ahmed (2009) noted that how much fund is distributed to the borrowers often remains an unclear fact in public-funded programs. Additionally, Basnet (2007) claimed that borrowers often regard the government credit as a mean of subsidy on their production practices. Such wrong perception makes them reluctant in repaying their loan which leads to the failure of the organization. Those issues involve higher transaction cost than the revenue earned from the interest which makes the organization unsustainable.

Unfortunately, there remains an essential gap in the literature regarding the examinations of the factors affecting the repayment performance of the less successful government-funded credit program. This justification is based on the literature reviews of several microfinance repayment studies that considered the successful programs as their cases. For example, the studies by Sharma and Zeller (1997) and Godquin (2004) considered the cases of GB[23], BRAC[24], ASA[25], BRDB[26], and RDRS[27] in Bangladesh which are already regarded as the successful NGOs in terms of outreach, impact, efficiency, outstanding profit margin and other indicators as estimated by several microfinance scholars (e.g., Pitt, 1999; Chowdhury et al., 2005; Rahman and Ahmed, 2010; Hermes, et al., 2011; Rahman et al., 2012; Ferdousi, 2015). In other countries like Malaysia, Al- Mamun et al. (2011), Nawai & Shariff (2012), and Mokhtar et al. (2012) studied the performance of cases like TEKUN[28], AIM[29], and YUM[30] MFIs. Even though all the three programs represent the subsidized government-led credit programs, yet, they can also be regarded as the successful ones with regard to their rate of repayment as reported by Mokhter et al. (2012). This study informs that AIM is the most successful program as it has the highest (98.98%) repayment rate as compared to the YUM's (90.72%) and TEKUN's (85%). However this study justifies that as all of these programs have already been successful through the better governance practices, further selection of them as a case study may not be so feasible. Instead, those programs need to be studied that are struggling to survive in the present competitive environment and are looking for the ways to come out of the poor condition.

Based on this background, this study has selected a case of a government-funded credit program called Bangladesh Handloom Board (BHB)'s Microcredit Scheme. The program was started in 1998 with the purpose of providing the credit as working capital to the handloom weavers[31] in Bangladesh so that these households could expand their business scale. In the end, the program aims to improve the livelihood of this leading non-agricultural community

[23] Grameen Bank
[24] Bangladesh Rural Advancement Committee
[25] Association for Social Advancement
[26] Bangladesh Rural Development Board
[27] Randpur Dinajpur Rural Service
[28] Economic Fund for National Entrepreneurs Group
[29] Amanah Ikhtiar Malaysia
[30] Yayasan Usaha Maju
[31] Handloom weavers are those whose livelihood is dependent on the handloom weaving occupation. As the name suggest, handloom weaving is referred as the process of producing the woven fabric (i.e. cloth) through the manual exercise of someone's hand and foot. The process requires a machine called loom which is made of wood and iron and is operated without any mechanical power or electricity. For further reading: BBS (2003), Islam and Hossain (2012)

in Bangladesh. It provides a small amount of credit ranging from 128 to 231 USD[32] at an interest rate of 10% for the periods of 36 months to the members of the groups against a maximum of five non-operational looms [33] so that these non-operational units can be productive (BHB, 1998, 2015).

Since its inception, the program has delivered approximately 7.9 million USD as credit and supported 40474 weavers and 54261 weaving units through its 30 basic centers (BHB, 2015). However, the program has only been able to withdraw 65.71% of its loan money as of June 2015 (BHB, 2015, p. iii). The comparative assessment of this figure with the three major and successful Microfinance Institutions (MFIs) in Bangladesh such as BRAC, ASA, and GB shows that the repayment rates of these organizations are over 98% (Pine, 2010). Such gap raises the following research questions:

- What are the factors affecting the loan repayment performance of the borrowers under the organizational structure of public microcredit program?

It is expected that the identification of the factors that hinder the borrowers in successfully repaying their loan will help the government-led MFIs undertaking better lending decisions through the selection of eligible clients. Hence, the organization's scarce capital will be utilized rationally, and default cases will be controlled. The better implementation mechanism guided by this study will finally help the organization to be financially viable.

The rest of this paper is organized into six different sections. Section 3.2 briefly discusses the methods of data collection and the analytical framework. Section 3.3 explains the probable explanatory power of the variables used in the model analysis. The tests that the model requires to be passed through are discussed in section 3.4. The major findings of the study and discussion of the estimated results are highlighted in section 3.5 and 3.6. Finally, the study concludes with some policy recommendations in section 3.7.

[32] 1 US Dollar = approximately 78 USD during December 2015

[33] The handloom machine that is not usable for production of the cloth either because of some technical fault or because of the lack of capital, market failure of the handloom products are termed as non-operational units or synonymously can be called non-operational looms (BBS, 2003)

3.2 Methodology of the study

3.2.1 Data Collection and Sampling Technique

A cross-sectional household survey was conducted during July to December 2015 using a structured questionnaire to collect the primary data. Following multistage sampling technique, the data were collected from 151 credit beneficiaries of BHB under Sirajganj district of Bangladesh. In the first stage of sampling, 3 basic centers (namely Shahjadpur, Ullapara, and Sirajganj Sadar) were purposively selected from 30 through which BHB is implementing its credit program in Bangladesh. According to BHB (2015, p. iii), the loan repayment rates under these centers are meager (average rate is just above 55%) as compared to the other basic centers.

In the second stage, the study again selected 4 sub-districts purposively (from 9) under Sirajganj District in consultation with the head office of BHB. These areas have the comparative advantage regarding the availability of significant numbers of BHB's beneficiaries as well as easy accessibility. These Upazilas are called Shahjadpur, Ullapara, Raiganj, and Belkuchi.

In the third and fourth stage, a total of 22 villages and 151 BHB credit users were randomly selected from the BHB's provided list of credit implementing villages. Finally, borrowers' individual, household, institutional as well as community-specific data were collected for the present study. The sample size varied in different study areas.

3.2.2 Analytical Framework

3.2.2.1 Theoretical Background

It needs to be noted here that in the BHB credit program if any borrower fails to repay their monthly loan obligation gradually for three times, they are considered as the loan defaulter. Therefore, the borrowers' performance in repaying their loan obligation falls between "two mutually exclusive alternatives." Moreover, the dependent variable of this analysis is dichotomous. When the dependent variable has two possible outcomes, it calls for the use of limited dependent variable models such as Linear Probability Model (LPM), Tobit, Probit or Logit model rather than the Ordinary Least Squares (OLS) estimation method (Gebremedhin, 2010; Awunyo-Vitor, 2012). However, the LPM has some limitations. For example, it results in some estimation error such as non-normality of the residuals as well as the heteroscedastic

variance. Such errors increase the possibility of the dependent variable to have a distribution other than 0 and 1 (Gujarati and Porter, 2008; Gebremedhin, 2010).

A researcher's choice of model selection between the Probit or Logit is quite flexible as these models do not require any strong theoretical background or interpretative approach. Preferably, they are based on the familiarity of the model use (Anik, 2012). Having such freedom, the Probit model is used in this study to identify the determinants of due-time loan repayment decision of the credit users. In the following section, the theoretical framework of the underlying idea is explained at first while the specification of the Probit model is explained afterward following Awunyo-Vitor (2012). The author narrated the model based on the threshold approach which incorporates the decision-making theory. This method illustrates that an individual's choice between the binary outcomes takes place only when the ability of a particular effort exceeds the individual's expectation subject to its limitation. More clearly, an individual may decide to pay the loan obligation in due time if the loan amount can generate sufficient income from a productive use including the cost that the individual has paid as interest on the loan amount. This decision will result in a value equal to 1 while the other possibilities will result in 0 in their decision criteria. However, such binary decision choice is also influenced by a variety of factors which need to be considered at the time of analysis. If the study apprehend such variables as X_i, then the probability of a particular decision to be equal to 1 can be expressed by the following formula:

$$P_r\left(Y_i = \frac{1}{\beta_i X_i}\right) = 1 - F(-\beta_i X_i) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Here F represents the cumulative distribution function. By using a real value, this function provides a measurement value ranging between 0 and 1. If this is the case, then a probability function of obtaining a 0 value can be specified as follows:

$$P_r\left(Y_i = \frac{0}{\beta_i X_i}\right) = F(-\beta_i X_i) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Keeping these specifications in mind, the use of maximum likelihood estimation technique can provide the parameters to be determined. If the study assumes that the selected dependent variable Y_i is an unobserved latent variable which is linearly related to the regressors, then the model can be specified as follows:

$$Y_i = \beta_i X_i + u_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

Where u_i indicates the error term of the model. Now, the observed value of the dependent variable can be obtained if Y_i takes a value greater than the threshold value and the otherwise. This is expressed as follows:

$Y_i = 1\ if\ Y_i^* > 0$ and $Y_i = 0\ if\ Y_i^* \leq 0$

Where the threshold value of Y_i is represented by the term Y_i^*which is hypothesized to have a normal distribution.

3.2.2.2 Econometric Specification of the Probit Model

The specification of the Probit model is advanced in the following section as follows:

$$P_i = P(Y_i^* < Y_i)$$

$$P_i = P\left(Y_i^* < \beta_0 + \beta_i X_{ij}\right) = F(Y_i) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (4)$$

$$P_i = F(Y_i) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{Z_i} e^{\frac{s^2}{2}}\, ds$$

WhereP_i symbolizes the probability of a particular decision making; s indicates a random variable having a normal distribution; Y_i implies the dependent variable having a value of either 1 or 0 (that is the successful loan repayment without any breaks in instalments for a maximum of three times as opposed to the inability to meet the loan obligation); Y_i^* is the threshold value associated with the variable Y_i.

Keeping these specifications in mind, a measure of the indicator Z_i can be retrieved by taking the inverse of the equation (4) which indicates the cumulative distribution function as follows:

$$Y_i = F^{-1}(P_i) = \beta_0 + \beta_i X_i + u_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (5)$$

At this point, it is not possible to know the extent to which the parameters of the Probit model explain the likeliness of the borrowers becoming a successful loan provider. The estimation of the marginal effect of each explanatory variable can provide such information which can be presented in the equational form as follows:

$$\frac{\delta P_i}{X_{ij}} = \beta_{ij} f(Z_i) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (6)$$

Where P_i stand for the mean dependent variable and its value is provided by the result of Probit model in the following form:

$$f(Z_i) = F^{-1}(P_i) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (7)$$

$$Z_i = \beta_0 + \beta_i X_i + u_i \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (8)$$

Where the term $f(Z_i)$ represents the density function of the standard normal variable and is as follows:

$$f(Z_i) = \frac{1}{\sqrt{2\pi}} e^{\frac{1}{2}Z^2} \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (9)$$

Finally, the econometric model for empirically estimating the factors determining the weaver households' continuous repayment ability can be specified as follows:

$$Y_i = \beta_0 + \beta_i X_i + u_i \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (10)$$

Where the dependent variable (Y_i) is repayment performance; and the independent variables (X_i) are respondents' age, education, occupational diversity, number of working family members, working experience, household asset, status of operational loom, household income, loan sources and size, opportunity cost of loan collection, group loan repayment efficiency, purpose of loan utilization, presence of loan monitoring system, and distance between MFI and the study villages.

3.3 Description of the Variables Used in the Model Estimation and the Hypothesis on their Probable Effects

The nature of the variables used in the model estimation and their probable effect on the successful repayment decision of the studied households are discussed as follows:

Repayment performance: It is the dependent variable which has the binary nature. Value 1 has been assigned for those borrowers who opined that they were able to repay their loan obligation on a continuous basis without any disruption in loan installments for a maximum of 3 times within 36 months period. Therefore, they are included in the non- defaulter's category. On the other hand, defaulters were those who failed to do so. It is noted that some of the borrowers are also included in the first category if they were successful in keeping their promise till the period of the survey, even though their loan repayment period was not terminated.

Age of the borrower**:** Age is expected to bring a positive feedback on the household's outcome. Many studies such as Oladeebo and Oladeebo (2008) and Ibrahim (2013) have identified this variable as a significant determinant of loan repayment. It is a proxy of experience and responsibility in carrying out the economic activities smoothly over the time (Papias and Ganesan, 2009; Ibrahim, 2013) which increases the credit users ability in repaying their loan. This study has used the binary nature of age where a value of 1 has been attributed to active members who were aged between 15-64 years as per the classification of 'Household Income and Expenditure Survey 2010' of Bangladesh (BBS, 2010). On the contrary, value 0 has been assigned to groups over or under this age range and is considered as the dependent family members.

Level of education: In line with Godquin (2004) and Awunyo-Vitor (2012), it is hypothesized that an educated borrower takes rational investment decision out of the credit received. Such attitude generates higher cash flows from the business which further help to repay the loan obligation. Therefore, this study assumes a positive and significant relationship with the outcome.

Occupational status: Handloom weaving is a labor-intensive work. Therefore, households engaged in more than one income sources are supposed to devote less time to their weaving business which can result in a downward business portfolio. The effect is further expected to be seen from the loan default behavior of the borrowers. On the contrary, Haile (2015) explained that if a single occupation fails to bring an adequate level of earning, at least the

borrower will have additional means of livelihood to survive in that situation. Hence, the probability of being a loan defaulter will be reduced. These two opposite ideas imply that the occupational status of the borrowers can have some ambiguous effect on the outcome variables. For this study, a binary nature of this variable is used where value 1 has been assigned to households with multiple occupations while 0 indicates otherwise.

Number of adult family members: As the handloom weaving is a labor-intensive work, the availability of the active adults within the households may perform different pre-production, production and post-production activities without hiring labor that can save the cash cost. In this regard, the family labor force is expected to bring positive impact on loan repayment outcome.

Business experience: The level of business knowledge, experience, and skill of the respondents is hypothesized to be positively associated with the response variable of the study. Onyeagocha et al. (2012) defined this variable as the decision tool which keeps the business wheel moving. In line with Haile (2015), this study expects that more prolonged involvement in the business will ensure secure sales and cash outlay as compared to the less experienced entrepreneurs.

Household asset: According to Ibrahim (2013), wealthy borrowers' having a higher level of household assets are more worthy of repaying their loan than their counterparts and vice versa. With such conception, this study expects to get a mixed effect of this variable on the outcome.

Operational loom: Operational looms are the handloom machines that are used for the current production. A significant number of these units indicate the stability of the production, sales, and income that is expected to have a positive dependence on loan repayment under this study. This variable is calculated as a proportion to the total numbers of handlooms within the family.

Household income: Bhatt and Tang (2002) and Nawai and Shariff (2012) noted that borrowers are challenged by their loan repayment obligation only when the business fails to generate sufficient income and vice versa. Therefore, either positive or negative sign is expected to be estimated by the model for this variable.

Loan amount from BHB: The amount of loan received from the financial institutions has been identified as a significant determinant of successful loan repayment by several authors such as Godquin (2004), Papias and Ganesan (2009), Awunyo-Vitor (2012), and others. Among them,

Godquin (2004) and Awunyo-Vitor (2012) justified that if the loan size is minimal, it might have little consequence on the business activity as the insufficient amount may not enable the borrowers to meet their cost of production. As a result, unproductive loan diversion may occur. On the other hand, Papias and Ganesan (2009) claimed that smaller loan size facilitates the repayment performance as the borrowers consider the big sized loan as the burden. For the study case, the loan amount varied depending on the presence of the number of non-operational looms as well as the type of the loom (see section 3.1). Therefore, any of both possibilities are expected to be determined by this analysis.

Multiple credit access: Being observed by the fact that majority of the studied borrowers had access to numerous credit sources other than BHB's credit, one question raise: to what extent such accesses to credit affects the loan repayment behavior of the borrowers? It is believed that if the credit from a single source fails to meet the demand, then beneficiaries may fill this gap by borrowing from other sources. On the contrary, overlapping loan cases might create a debt burden for them. Such effect is expected to have an adverse association in their repayment decision. For the model estimation, this variable has been captured by binary choice where the value of 1 is assigned to the borrowers if they obtained the credit from multiple sources during 2015 and 0 for the otherwise case.

Opportunity cost of loan: Borrowers' intention to cover the opportunity cost of loan collection such as the time wastage during the loan collection, physical weakness due to traveling and the similar kinds are expected to have a negative association with the outcome variable. An increased level of this cost reduces the net value of the credit received which makes them reluctant in repaying their loan.

Efficiency of the group in loan repayment: Having knowledge on the mixed effects of group repayment policy estimated by several authors (e.g. Sharma and Zeller, 1997; Zeller, 1998; Kaboski and Townsend, 2005; Njangiru et al., 2014; Kamanza, 2014; Asgedom et al., 2015), this study intended to check whether it is a useful strategy in ensuring the higher loan repayment under the BHB's credit program. In doing so, a binary form of this variable has been included in the model estimation.

Loan utilization: Short-term economic activities directed toward production purposes are assumed to play a prominent role in improving the loan repayment performance (Papias and Ganesan, 2009). In line with the authors, a positive effect is expected to be estimated by the model on the outcome.

Monitoring and supervision: It is assumed that borrowers are less likely to keep their repayment commitments in case the governance practice regarding what the borrowers' do with their credit remain absent from the system. Such malpractice can have some adverse consequences on the repayment behavior. Papias and Ganesan (2009) reported that loan monitoring and supervision also guides the borrowers to understand the technical problems in its use. It also provides advice to the borrowers in solving the problems. Through this mechanism, an excellent lender-borrower relationship could be developed which will ensure the higher loan repayment. This study assumes to obtain a positive sign for this variable through the model estimation.

Distance of MFIs from the study villages: As estimated by Awunyo-Vitor (2012) and Osondu et al. (2015), this study supposes that an increase in the cost incurred per kilometer increase in obtaining the credit increases the repayment default. The reason for such an idea is that the monitoring, supervision and additional service delivery are troublesome to the villages situated far away from the credit institution. With such conceptions, distance has been analyzed to check in which direction it is associated with the repayment capacity.

3.4 Model Tests

Several tests have been conducted to measure the best fit of the model. Tests such as the test of normality and multicollinearity had been conducted before running the model while tests such as the test of heteroskedasticity, likelihood ratio and goodness of fit have been conducted after.

The normality test revealed that some of the continuous variables were not normally distributed with zero mean and constant variance. Therefore, variables such as education, household assets, experience, loan size, and household income were transformed into their logarithmic form before fitting them in the model estimation. Thus, the normality of the model estimates is ensured.

Variance Inflation Factor (VIF) is an estimate that calculates the presence and extent of multicollinearity among the explanatory variables. It was conducted using "vif" command in STATA-12. The test provided an average VIF score of 1.56 which was less than 10. Therefore, it also confirms the non-existence of multicollinearity in the model estimation. For all explanatory cases too, it is found to be less than 10.

To make sure that the estimated model is free of heteroscedasticity problem, the study estimated the robust standard error as evidenced by Table 7. Therefore, it can be concluded that the estimated model has the homoscedastic variance.

To check whether the estimated model is strongly fitted as compared to a less restrictive one, the "lrtest" command was run in STATA-12 where the null hypothesis was that the entire slope coefficients of the model are equal to zero meaning that the model with additional variable has no explanatory power. Once again, it is a pleasure of this study to conclude that the current model is the best fit for this estimation as the test statistic has revealed an insignificant Chi-squared value of 0.88.

Finally, the study estimated the goodness of fit using "fitstat" command in STATA-12. The test provided the McFaddens Pseudo R^2 value of 0.15 implying that the analyzed model can demonstrate about 15% variations in the outcome variable with the help of the given values of the explanatory variables. However, the interpretation technique of R^2 for binary outcome models such as Probit or Logit should not be compared with the standard R^2 value in OLS method as it attempts to distinguish the estimated model with a model having only constant intercept term (Hagle and Glenn, 1992).

3.5 Results of the Study

3.5.1 Descriptive Statistics of the Variables Used in the Probit Model Estimation

Both the qualitative as well as quantitative variables are used in the model estimation. The descriptive statistics of the quantitative variables are explained regarding mean values whereas the qualitative variables are described in percentage form (

Table 6). The result shows that the proportion of BHB's loan defaulters accounted for 59% which was much higher than the successful borrowers (41%). The majority of these borrowers were under the age group of 15-64 years (68%) having lower than a primary level of education (nearly 4 years). About 68% of the borrowers undertook handloom weaving as the single most occupation. On an average, almost 4 active adults were available in the borrowers' family, and they were comprehensively experienced in managing their business over the period of nearly 24 years.

About asset position, the study has estimated a moderate level of household assets equals 2,604 USD. On an average, borrowers' families had a total 8 looms of which 73% of them was productive during the period of the survey. As per the latest 'Handloom Census' conducted in 2003, this figure was 61.3% of 2.8 handlooms owned per unit (BBS, 2003, p. 24-25). This indicates that as of December 2015, the numbers of operational looms owned per weavers' household have increased significantly over the 12 year time period. Furthermore, the sales of cloth from the production of those operational units generated an income level of approximately 15,133 USD for each borrower.

With regard to the credit, this study estimated an average of 325 USD received from BHB as a credit while 55% of the borrowers had access to multiple credit facilities. In 2003, out of total 32126 handloom establishment who received credit, almost 90% received it from different formal banks, non-banks (e.g., cooperatives) and informal sources (e.g., relatives, Mahajan/Paiker[34] and others). The rest 10% received the credit of approximately 190 USD per borrower from BHB (BBS, 2003, p. 89, 93).

In order to collect the credits from different sources, the borrowers had to pay nearly 7% of the total credit amount as the opportunity cost for which they had to travel around 6 kilometers from their villages. Although the monitoring was quite limited (as reported by 40% of the credit users), yet, most of them (about 71%) utilized their loan for productive purpose.

[34] Local names of powerful middlemen who act as the informal sources of finance. Basically, this group controls the handloom weaving sector at the local level

However, the majority of them (nearly 59%) opined that the BHB's group-based lending policy is not helpful for their on-time loan repayment.

Table 6: Descriptive statistics of the selected variables used in the Probit model estimation (N=151)

Variable description	Descriptive statistics	Standard deviation	Expected sign
Dependent variables			
Successful loan repayment (dummy: 1 = yes, 0 = no)	Yes = 41%, No = 59%	-	
Independent variables			
Age (dummy: 1 = 15-64 years, 0 = otherwise)	Yes = 68%, No = 32%	-	+
Education (years)	4.22	3.85	+
Occupational status (dummy: 1 = multiple, 0 = single)	Yes = 68%, No = 32 %	-	+/-
Working family member (number)	3.67	1.58	+
Working experience (years)	23.62	12	+
Household assets (USD)	2,604.30	2,848.70	+
Operational loom (proportion to total number of loom)	72.63	29.06	+
Household income (USD)	15,132.82	11,302.87	+/-
Loan size (USD)	325.14	422.77	+/-
Access to multiple credit sources (1 = yes, 0 = no)	Yes = 55%, No = 45%	-	+/-
Opportunity cost of loan collection (proportion to total loan received)	6.78	9.32	-
Efficiency in group loan repayment (dummy: 1 = efficient, 0 = inefficient)	Yes = 41%, No = 59%	-	+/-
Loan utilization (1 = productive, 0 = otherwise)	Yes = 71%, No = 29 %	-	+
Loan monitoring system (dummy: 1 = yes, 0 = no)	Yes = 40%, No = 60%	-	+
Distance of MFIs from villages (kilometer)	5.75	5.11	-

Source: Field survey, 2015

3.5.2 Factors Determining the Loan Repayment Performance of the Borrowers under BHB's Microcredit Program

The results of the econometric model estimation are presented in Table 7. Most of the explanatory variables used in this analysis are identified as significant determinants of repayment performance by the model. Among them, six variables such as households' working labor force, assets position, operational loom, loan size, opportunity cost, and the productive loan use is found to have a positive sign. On the other hand, occupational status, work experience, income and distance variables are found to have a negative relationship with the response variable. The positive sign of the coefficients implies that an increased level of the relevant variables increase the likeliness of the borrowers' successful repayment, while the coefficients with negative sign reduce such possibilities. Apart from the signs, the significance level of the variables such as operational looms and opportunity cost are estimated at 1% level; occupation, adult family members, income, and the distance are estimated at 5% level; and work experience, household assets, loan size and its utilization are estimated at 10% level. This study dismisses the probable explanatory power of the variables having more than 10% significance level. More clearly, they are not regarded as the significant determinants of loan repayment. They include households' age, education, multiple credit access, loan monitoring and the group loan repayment policy. However, it can be said that borrowers' tendency regarding on-time repayment can be facilitated by increasing the volume of these variables having a positive sign. Therefore, they also require focus from the policy perspective.

The marginal effects estimated at the mean value presented in Table 7 inform about the change in the probability of the predictor variables due to a unit change in their associated level. For the binary variables, it expresses the change in the likelihood due to a discrete change between 0 to 1 considering all other variables as constant (Torres-Reyna, 2014; Williams, 2016). For example, occupational status can be interpreted as: if the borrowers who are currently involved in their handloom weaving occupation only decide to engage themselves in multiple occupations, their probability of continuous loan repayment will be decreased by 27 units. Likewise, the marginal effects of other variables can be interpreted. For the continuous variable, it expresses the rate of instantaneous change in the probability of the dependent variable being 0 and 1 (Torres-Reyna, 2014; Williams, 2016). For example, the marginal effect of the variable number of working household members suggests that the borrowers' ability of due-time repayment will be increased by 7 units with each additional

number increase in active adult within the household. Correspondingly, the other variables can be interpreted. The estimated marginal effects are found to be identical to those variables that significantly influenced the loan repayment performance of the handloom weavers. Just that their extent differs from the previous calculation.

Table 7: Determinants of successful loan repayment by the borrowers under BHB's credit program

Variable description	Coefficient	Robust Std. error	Marginal effect at mean	Delta method std. error
Age of the borrowers (dummy: 1 = between 15-64 years, 0 otherwise)	-0.09	0.28	-0.04	0.11
Log of education (years)	0.16	0.14	0.06	0.05
Occupational status of the borrowers (dummy: 1 = multiple, 0 single)	-0.60**	0.26	-0.23**	0.10
Number of adult family members	0.18**	0.09	0.07**	0.03
Log of working experience (years)	-0.32*	0.19	-0.12*	0.07
Log of present value of household asset (USD)	0.41*	0.23	0.16*	0.09
Operational loom (Proportion to the total loom)	0.01***	0.01	0.01***	0.00
Log of total income from household activities (USD)	-0.50**	0.25	-0.19**	0.09
Log of loan size from BHB	0.46*	0.25	0.18*	0.10
Access to credit sources other than BHB (dummy: 1 = yes, 0 = no)	0.20	0.34	0.08	0.13
Opportunity cost of loan obtainment (% of total credit amount)	0.03***	0.01	0.01***	0.00
Efficiency in group loan repayment (1 = efficient, 0 = inefficient)	-0.18	0.33	-0.08	0.13
Loan utilization (dummy: 1 = production, 0 = otherwise)	0.47*	0.27	0.17*	0.10
Loan monitoring system (dummy: 1 = yes, 0 = no)	0.09	0.23	0.04	0.09
Distance of MFIs from the borrowers commune (Km)	-0.14**	0.06	-0.05**	0.02
Constant	-4.15	3.58		
No. of observation	151			
LR Chi^2 (15)	32.92***			
McFadden's R^2	0.15			
Likelihood-ratio test	0.16			
Predicted probabilities	70.86 %			

*** p<0.01, ** p<0.05, * p<0.1
Source: Field survey, 2015

3.6 Discussions of the Findings

A discussion on the estimated finding following a comparative assessment of the existing literature described in section 3.3 is presented in the following paragraphs. It is noted that some of the estimates are found to be consistent while some are incompatible.

As opposed to Haile (2015), this study confirms that multiple income earning possibilities are not a good strategy for improving the repayment performance of the handloom weavers in Bangladesh. The significant adverse effect implies that the decision to engage in multiple activities diverts labor from this manpower-based occupation. This reduced efforts in the business result in lower production, lower income, and eventually lower repayment.

As expected earlier, the study confirms that the joint efforts of the active adults within the family positively and significantly determine the on-time loan repayment decision of the credit receivers. This result is also consistent with the findings by Haile (2015), although the researcher alternatively used the number of dependents instead of working adult as the measurement variable.

Over the contradiction with several studies by Oladeebo and Oladeebo (2008), Afolabi, (2010), Onyeagocha et al. (2012), Shu-Teng et al. (2015), and Haile (2015), this study finds that a one-year increase in work experience decreases the likeliness of the borrowers to repay their loan on-time. This result signifies that experienced credit receivers have already realized the full potential of their business and are no more interested in investing their credit amount in the same business. Instead, they are interested in investing the money for the consumption of luxury or durable items like land, jewelry and so forth which do not immediately bring the return on investment.

With regards to the existing household assets, the study has found a significant positive coefficient as assumed before. It implies that as the wealth position increases, it increases the probability of the borrowers to keep their commitment of continuous loan repayment. This finding is in line with a past study by Godquin (2004).

The higher proportion of operational production tools increases the probability of loan repayment. It means that the increased ability of the borrowers is multiplied by their greater possession of these tools with which they can produce more and thereby, can earn more income. Finally, the higher income contributes to higher loan repayment. Unfortunately, no

literature is found to be using this variable for the highlighted analysis, as it is more specific to handloom weaving business.

A quite surprising finding has been found for the income variable which implies that as household income increases, it increases the probability of the borrowers to default their loan repayment. This probable reason could be that the cost of production was much higher than the level of income generated from the business which has not been taken into consideration into this analysis. Whatever the reason is, this result is supported by some recent studies such as Afolabi (2010), Nawai and Shariff. (2012), Bhatt and Tang (2012) and Anigbogu et al. (2014) while it is utterly contradictory with Osondu et al. (2015).

The size of credit received from the BHB plays a significant role in increasing the probability of higher repayment as estimated by the model. This finding confirms that a unit increase in loan size enables the borrowers to purchase more volume of raw materials for the weaving business. Therefore, business expansion, as well as higher income takes place which further increases the loan repayment ability of the users. This estimation confirms the plausibility of the studies by Oladeebo and Oladeebo (2008), Afolabi (2010), Onyeagocha et al.(2012), Nawai and Shariff (2012), Shu-Teng et al. (2015) and Awunyo-Vitor (2012) while it deviates with the studies by Godquin (2004), Papias and Ganesan (2009) and Osondu et al. (2015).

A study by Anigbogu et al. (2014) can be referred for supporting the finding regarding the relationship between opportunity cost of loan collection and loan repayment. A positive and significant sign of this variable explains that as the level of this cost increases, the proximity of loan repayment also increases. This finding is entirely unanticipated as this study expected a different connection between these two variables.

The expected result is also found for the distance variable which is in line with the studies by Awunyo-Vitor (2012) and Osondu et al. (2015). The result implies that as the distance increases, the chance of borrowers' successful loan repayment decreases due to the rise in extra cost incurred for traveling purpose. Even, the efficient service delivery, as well as the process of monitoring and supervision, is disturbed by the increase in distance. On the other hand, this finding disagrees with the ideas given by Nawai and Shariff (2012) and Haile (2015).

The use of loan for the productive purpose has a good connection in increasing the probability of the timely loan repayment as it is found to be positively significant. This result confirms the earlier literature by Papias and Ganesan (2009).

3.7 Conclusion and Policy Recommendations

The studies of microfinance have gained popularity from the perspectives of policymakers as well as the researchers throughout the world. It is proved as an emergent tool for poverty reduction and employment generation. Its effectiveness is mostly viewed in the promotion of small and medium-scale enterprises such as the case of handloom weaving discussed in this study. However, the sustainability of microfinance program is often a controversial issue in case a considerable gap is observed in loan repayment rate than the actual disbursement which is the most common case in the government-funded credit program. Given that different program faces different constraints depending on their organizational capacities; the factors of the highlighted problems might differ under different organizational setup. Failure to identify those context-specific factors, therefore, may undermine the program's actual potential. However, in Bangladesh, such study is limited among major NGO-led MFIs performance assessment whereas this study justifies the importance of the studied content considering the state-sponsored credit case, such as the case of BHB's microcredit scheme. Thus, it aims to fill the gap in the available literature. In fact, it is a problem-solving approach in the field of microfinance.

Even though the study has identified several positive and negative significant determinants of loan repayment through the model estimation, it recommends the policy options based on the factors that serve as the principal impediments for the organizational viability.

As the study reveals that multiple occupational opportunities are inefficient for the weavers in Bangladesh regarding labor diversion and lower income ability, one of the options for the credit institutions would be targeting only those borrowers who are engaged in only handloom weaving business. However, this recommendation could be more specific to the handloom weaving business believing that the other non-agricultural activities are not labor-intensive, thereby, do not withdraw labor from those practices.

As the study suspected that the cost of production was much higher than the income as estimated by the negative income effect of the model, it calls for government attention in reducing the price of raw materials or facilitating the market for handloom products. In doing so, efforts such as abolishing the import restriction or subsidy on raw materials may help.

Distance will not act as a constraint in successful loan repayment if the organization can deliver financial as well as non-financial services at the doorstep of its users. These services can be facilitated by opening up more branches or by strengthening up the organizational

structure through extension services. The extension services will favor the monitoring process in one hand. On the other hand, it will enable the borrowers to keep track of their income and investment outlays. Thus, the borrowers will be better able to manage their business.

Finally, the study recommends that before sanctioning the loan, the lending institutions should focus on those variables that have been identified as significant and which are expected to bring desirable result if the volumes of those services are increased. Moreover, these recommendations can be generalized among governmental, non-governmental or any other formal and informal credit programs and projects in assessing the repayment performance.

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4 Governance Challenges of a Government-funded Non-agricultural Microcredit Program for the Handloom Weavers in Bangladesh

Abstract

This article examines why governance challenges arise in the implementation of the government-sponsored credit programs in Bangladesh taking the Bangladesh Handloom Board (BHB)'s Microcredit Scheme as an example. Using a unique participatory method called Process Net-map, the study identifies and distinguishes the challenges faced by both the supply-side (i.e., BHB) and demand-side (i.e., borrowers) stakeholders. The findings reveal that the BHB's program faced problems in allocating adequate resources to human and physical capacity development. This issue was exacerbated by the shortage of funds that made it impossible to meet the clients' expectations. The failure to control the political influence and the corruption in the fund flow were also caused by the lack of legal and regulatory framework of the organization. Moreover, the policy of lending only to groups proved counterproductive in this case, as it led to the exclusion of potentially viable borrowers. Therefore, this study recommends for the reformulation of the BHB's microcredit policy along with several other policy implications.

Keywords: Governance challenges, Government-funded credit program, Process Net-map, Bangladesh Handloom Board

4.1 Introduction

Microcredit, broadly defined as microfinance, is an institutional arrangement of providing a scope to the poor, often regarded as unbankable, access to different financial and non-financial services (Bassem, 2009). It was originated from Bangladesh during the 1970s. Since its inception, it is successfully serving as a useful tool for poverty reduction and employment generation, therefore, holds the mainstream of development plans of the Government of Bangladesh (GoB) (Ahmed, 2009). In recent years, it has become one of the popular topics of discussion in the policies of many developing and underdeveloped countries like India, China, Thailand, Vietnam, Malaysia, Philippines, Sri Lanka, and others (Hartaraska, 2005; Hulme and Moore, 2007; Thapa, 2010, Siwale & Ritchie, 2011; Mcintyre, 2012).

Over the years, Bangladesh has introduced various innovative strategies in effectively delivering the microcredit services to the poor. For example, the group-based lending practice of Grameen Bank (GB) introduced by Mohammad Yunus is well-known due to the group's liability in ensuring full repayment. Other innovative strategies imply savings, health, education, training, advice and many other services. These innovative practices have made this country unique all over the world (Hulme and Moore, 2007; Thapa, 2010).

However, Moreno (2004) and Morvant-Roux et al. (2014) noted that microcredit programs are inherently confronted with some challenges as they go through several processes while transferring the fund from the supplier's point to the beneficiaries. Given that different countries adopt different systems and institutional reforms in delivering the microcredit services, poor governance of the processes poses various challenges in the successful implementation of microfinance operations. As a result, the program fails to achieve its social and financial obligation, making the organization unsustainable (Hartarska, 2005; Thapa, 2010).

The problem is more sensitive to the implementation of public-funded credit programs as compared to the Non-government Organization (NGO)'s microfinance with regard to the high operational cost of fund transfer. Even, the estimation of how much fund is channelized to the hard-core poor remains unclear if those MFIs lack adequate organizational structure including human and physical resources (Ahmed, 2009). Also, Thapa (2010), Nawai and Shariff (2012), and Shu-Teng et al., (2015) noted that majority of the semi-formal (NGOs) and informal types of MFIs that are not profit oriented usually obtain their fund from the government-owned banks. However, the allocation and disbursement of the public capital are not assured in time.

Therefore, timely loan repayment is also not guaranteed from the borrowers' side. These interconnected facts cause the organization being unsustainable or highly dependent on subsidies. Whatever the challenges are, there is an increasing need to disclose and address those challenges (Zaman, 2013). Failure to do so will continue to undermine the potential of public funds through the microcredit initiatives.

As microfinance is a global term, numbers of national (e.g., Pitt, 2000; Godquin, 2004; Chawdhury et al. 2005; Rahman et al.,2009; Rahman & Ahmed, 2010; Rahmatullah et al., 2010; Khandker and Samad, 2013; Quayes & Baqui Khalily, 2014; Khandker & Koolwal, 2016 and many others) and international (e.g., Diagne and Zeller, 2011; Haq et al., 2009; Hermes et al., 2011; Nawai and Shariff, 2012; Akwaa-sekyi, 2013; Chauke et al., 2013; Ibrahim, 2013; Luan, 2015, and others) quantitative studies have already been conducted in this country. To a great extent, these studies empirically estimated the client's coverage, growth, impact, financial sustainability, repayment rate, efficiency, return on equity, and the estimations of the similar quantitative indicators that serve as the success factors of microfinance programs. However, qualitative study is seldom found in examining the factors that can even cause the organization to fail.

Among the existing governance-specific literature (e.g., Hartarska, 2005; Lan & Tran, 2005; Bassem, 2009; Mersland & Strøm, 2009; Kono & Takahashi , 2010; Morais & Ahmed, 2011; Mcintyre, 2012; Moreno, 2004; Augustine, 2012; Robinson, 2017), very few (e.g., Rahman, 2007; Ahmed, 2009; Zaman, 2013) have been conducted in Bangladesh. None of these studies have explored the performance of government credit program. Majority of them are based on the review of the performance of successful NGO-led MFIs, most commonly BRAC[35], ASA[36], and GB and others, as the case. Furthermore, these studies utilized the secondary data sources such as the reports of Bangladesh Bank, country-level reports of different development organizations (e.g., IMF, WB, FAO), different organization-specific data and the similar kinds. The use of primary data is rarely found in this field.

This study, therefore, highlights the necessity of qualitative study in the field of governance through utilizing the field data. Although the quantitative analysis is undoubtedly necessary for economic impact assessment, they are not suitable enough to understand why the governance challenges arise and from where? Which factors need to be addressed to implement the government-run programs better? Therefore, one of the commencing

[35] Bangladesh Rural Advancement Committee
[36] Association for Social Advancement

contributions of this study would be the use of a unique qualitative method called PNM (discussed in section 4.4) that has never been used in the field of microfinance.

Additionally, researchers such as Baqui Khalily (2004), Lapenu & Pierret (2006), Thapa (2010) and Moreno (2004) emphasized the examination of the factors through in-depth qualitative research involving not only the supply-side participants but also the demand-side (i.e., beneficiaries) participants. These authors justified that taking both views into the analysis results in the development of flexible and workable financial system. It also helps to interpret the findings in a more convincing way. However, the studies reviewed above did not cover both views into their analysis. From that point of view, another contribution of the study can be justified.

Finally, by uncovering the governance challenges, this study aims to fill the gap in the literature with regard to why government-run credit programs in Bangladesh cannot operate at the break-even point, while many other NGOs have remarkably been successful. In conducting this study, a case study approach has been employed whereas Bangladesh Handloom Board (BHB)'s microcredit scheme served as a case (elaborated in section 4.3). It is expected that the present study will lead to the better program design that will be applicable not only for the microfinance programs but also for the other programs which receive fund from the government.

The rest of the paper is organized as follows: section 4.2 presents the conceptual framework of improving the governance of microfinance program. A brief introduction to the case is given in section 4.3. Section 4.4 and 4.5 describes the data, analytical technique, and the empirical findings of the study. The discussion and recommendations are presented in section 4.6. Finally, this study concludes in section 4.7.

4.2 Conceptual Framework for Improving the Governance in Microfinance Programs

The conceptual framework of improving the governance in the microcredit program presented in Figure 3 has been adopted and modified from Birner (2009). The framework shows how a good coordination between demand and supply-side strategies will minimize the challenges, thus, will ensure good governance through better program design and effective service delivery.

On the supply-side, the good governance is mostly determined by the ability of the public-sector credit providers in performing their task effectively. This ability is influenced by various organizational policy and procedures. Therefore, some measures are needed to improve the regulatory capacity so that it can provide the adequate services. It may include increasing the fund allowance and human and physical resource endowments, ensuring proper administration of the program and the similar activities. Finally, the need-based approach might be envisaged through the revision and reformulation of organizational policies rather than the prescribed, however, inefficient plan of execution.

On the demand-side, good governance is ensured when the borrowers are able to demand and acquire an adequate amount of credit, support services, and other infrastructures from the public lending institutions. In fact, it implies the borrowers' ability to hold the organization accountable. Such ability is also influenced by various socioeconomic as well as the cultural conditions. Therefore, some strategies are needed to improve their ability such as involving them in the planning and policy-making process following a bottom-up approach. The field demonstration process can also be strengthened so that the borrowers are better informed about the products and services they are supposed to receive from the organization. Thus, the transparency between the lender and the borrowers is maintained. If not, an enabling environment should be created through conducting workshops or seminar where borrowers are able to raise their voice regarding the kinds of services they require. By this way, good governance is ascertained.

Figure 3 also shows that both the strategies must be a good fit from both perspectives as indicated by the good-fit arrow signs. Some other factors may also affect the ability of both the lender and the borrower. Therefore, they should be taken into consideration. In the end, it is expected that a perfect coordination between the supply-side and demand-side stakeholders will lead to the better program implementation.

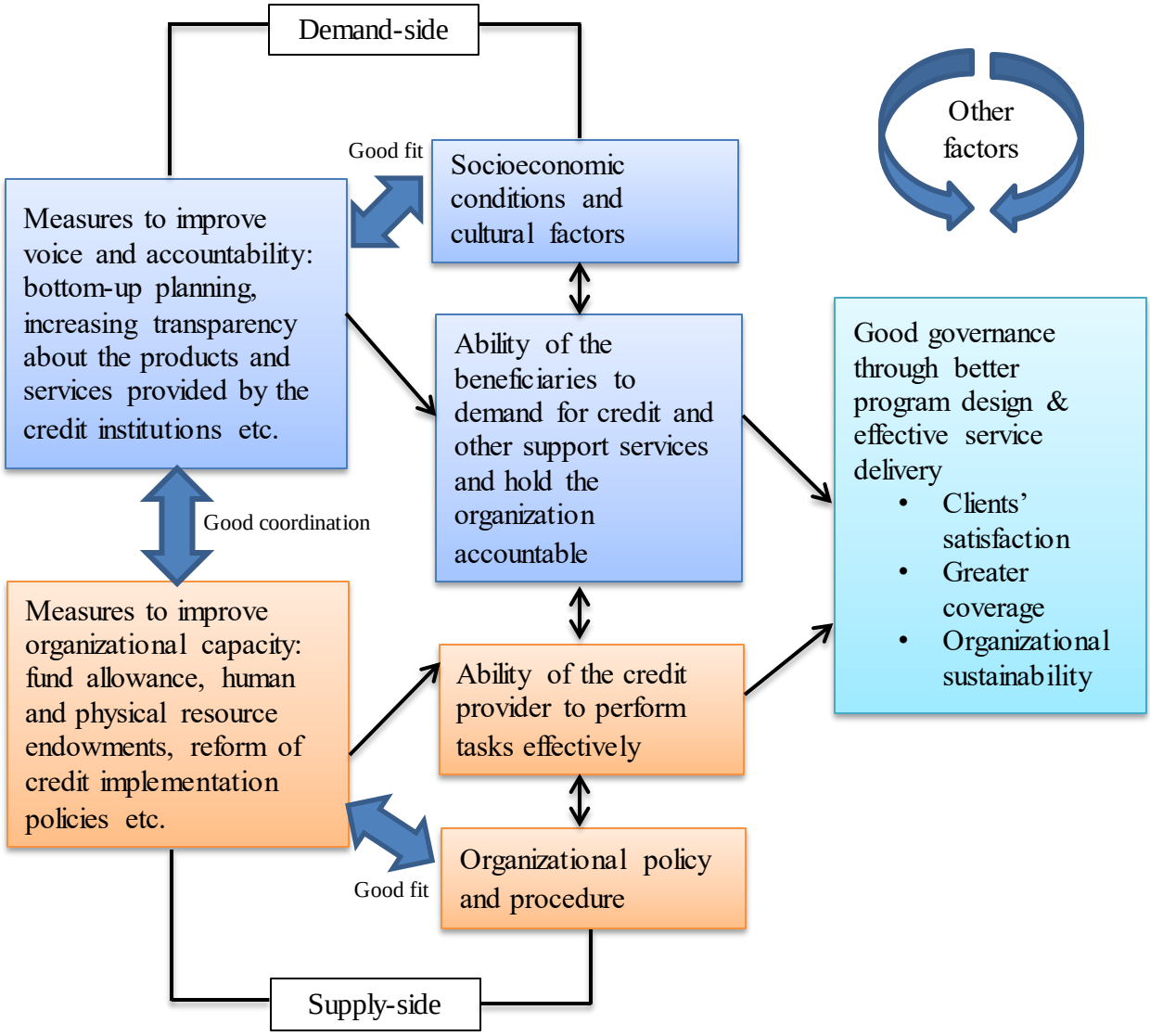


Figure 3: Conceptual framework for improving the governance through the coordination between the demand and supply-side approaches

Source: Adapted and modified from Birner (2009)

4.3 Study Context and the Case Selection

To achieve the research objective, this study selected a case of public microcredit program implemented by a public organization called Bangladesh Handloom Board (BHB). The BHB was established in 1977 to perform various developmental activities for the handloom sector in Bangladesh[37]. It is administered by the Ministry of Textile and Jute (BBS, 2003). As a part of the developmental initiatives, the BHB started a credit project in 1998 with the aim of providing the microcredit as working capital to the handloom weavers[38]. The credit amount ranging between 128-231 USD[39] is provided to the weavers against 1-5 of their non-operational looms[40] so that they can meet the cost of production of these non-operational units to make them operational. The production from these operational devices is further expected to expand the business scale of this prominent small-scale non-agricultural enterprise in Bangladesh. Thus, the program aims to improve the livelihood of the weavers in Bangladesh (BHB, 1998; BHB, 2015).

Since its inception, the BHB has delivered approximately 7.92 million USD as credit through its 30 basic centers. Unfortunately, it has only been able to withdraw 65.71% of the disbursed amount as of June 2015 (BHB, 2015, p. iii). This figure is quite frustrating as compared to the loan repayment performance of some successful microfinance institutions such as GB, BRAC, and ASA[41]. Although the BHB's operational guidelines are identical to these institutions, particularly to GB, such poor repayment figure indicates that there must be some leakages in the governance of this program. It has also raised the following research questions:

[37] The handloom sector is a traditional non-agricultural cottage industry in Bangladesh. It is labor intensive which employs more than 1.5 million populations. It is considered as the second largest employment provider after agriculture in Bangladesh (Rahman, 2013, p. 11; Liton et al., 2016, p. 70). It also contributes to more than 28% of domestic cloth production which meets the demand for one of the non-consumable basic needs of life (BBS, 2003, p. 13). For more details: BBS (2003), Islam and Hossain (2012), Rahman (2013), Rahman et al, (2014) and Liton et al., (2016).

[38] Handloom weavers are those who are involved in handloom weaving occupation. Handloom weaving is defined as a traditional way of producing woven fabric without the help of any mechanical power. People use their hand and foot in a proper movement to operate the handloom machine that is normally made of wood and iron. For more details, Islam and Hossain (2012) and Rahman (2013)

[39] 1 US dollar = approximately 78 Bangladeshi Taka (BDT) during December 2015

[40] The handloom machine that is not usable for production of the cloth either because of some technical fault or because of the lack of capital, market failure of the handloom products are termed as non-operational units or synonymously can be called non-operational looms. On the other way, they are called operational looms.

[41] GB, BRAC and ASA are the three major successful MFIs in Bangladesh whose loan repayment rates are above 98% (Pine, 2010)

- How does the BHB implement its credit program?
- What are the governance challenges faced by this institution that has contributed to weak performance?

4.4 Materials and Methods

A qualitative case study approach has been used to conduct the present study. Therefore, purposive sampling technique was used to collect the data from 3 basic centers of BHB out of 30 through which the studied credit institution is carrying out their microfinance activities in Bangladesh. To ensure the anonymity of the respondents, the names of those centers, as well as the district names, are not disclosed. The fieldwork was conducted during November 2016 to January 2017 using semi-structured interview schedule.

The data collection process involved two phases. In the first phase, the study utilized a novel data collection method called Process Net-map (PNM)[42] which is the revised and modified version of Net-map initially developed by Schiffer (2007). It is a useful method of understanding, improving and coordinating the institutional perspectives in a multi-stakeholder analysis, such as microfinance, considered in this study.

The principle of constructing the PNM (Figure 4) was to visualization the microcredit implementation processes involving the branch-level officers at the selected basic centers. The method itself involved three consecutive stages. The first stage involved the identification and listing of different stakeholders who played a crucial role in the loan implementation process at different stages. These actors were marked using actor cards of different colors and were placed on a large sheet of paper. At the same time, the respondents were asked to draw the arrow sign between the processes showing how different stakeholders are linked to each other. These linkages were thereafter numbered to identify the sequences of ties. These sequences were further noted at the bottom of the sheet. Additionally, the lines of the arrows were mapped by different colors so that the types of linkages can be distinguished from each other. For example, the red color of the arrow line indicated the fund flow while green symbolized the communication and information flow.

In the second step, the respondents were asked to rate the assumed influence level of each actor on the achievement of outcome whereas the outcome was defined as the effective fund transfer from supply-point to the demand-point. Some rubber pieces were used to indicate the

[42] Read more on how to conduct PNM: https://netmap.wordpress.com/process-net-map/

influence tower which was placed next to each actor. The ranking was done using a scale of 0-10. The higher the tower, the more influence that actor had on the outcome. The towers for the actors having little or no influence on the outcome were placed on the ground.

The final stage of PNM construction was asking the respondents eliciting the governance challenges of the studied program and identifying the potential entry points of those challenges. These points were marked by using a start sign beside those actors who were responsible for creating those challenges. This stage was very sensitive as it involved the risk of organizational disreputability. Therefore, a high level of confidentiality was assured between the researcher and the respondents at this point. In the end, a total of 3 PNMs were constructed which was thoroughly discussed with the respondents to get a general overview of the process and to validate the collected information.

The second phase of data generation was face-to-face conversational interviews with the Key Informants (KIs) from both supply-side and demand-side to get the in-depth knowledge of the studied case. A total of 9 interviews were conducted from the supply-side including the respondents from the PNM exercises, program manager at the central office of BHB, field supervisors at the branch offices, and the bank managers at Bangladesh Krishi Bank (BKB) and Rajshahi Krishi Unnayan Bank (RAKUB) through which BHB accomplishes the credit transactions with its clients. On the demand-side, 34 credit receivers were interviewed. In total, 43 in-depth interviews were carried out as summarized in Table 8.

Table 8: Summary of the in-depth interviews

Type of stakeholders	**Number**
Supply-side	
Program manager	1
Liaison officers*	3
Field supervisors	3
Bank managers	2
Demand-side	
Credit beneficiaries	34
Total	**43**

**Process Net-Maps were conducted with stakeholders from this category. Other stakeholders performed the role of KI*

Apart from that, project reports, policy papers, and other materials were also reviewed. All the interviews were manually noted by the researcher as well as the research assistants while some of the discussions were audio recorded. Cross-checking of the collected information was also done on the spot.

Finally, the content analysis technique was used to analyze and interpret the findings which were deductive in nature. It was done following the steps reported by Marying (2000), Rabiee (2004), Hsieh & Shannon (2005), Kohlbacher (2006), Elo & Kyngäs (2008), and Bengtsson (2016). The first analytical step was being familiarized with the data by proof-reading of the notes taken during the interview, listening to the records, summarizing the information from the recorded tapes and reading them repeatedly. The second stage involved developing a thematic framework of the conducted interviews by writing memos or short phrases in textual form. This process facilitated the forming of descriptive statements as narrated by the research participants. The highlighting and sorting were done in the third stage of the analysis. The contrasting and comparisons of the cases narrated by different stakeholder were manually performed in a table both within and between the sorted or highlighted statements regarding the identification of governance challenges in stage four. The re-arrangement of the data in such a manner helped to reduce the data volume. Finally, the narrative based interpretation technique was adopted based on the consistency and reliability of the answers to the research questions and the frequency of the views expressed.

4.5 Results of the Study

This section presents the study findings under three sub-headings. The first heading describes the step-by-step credit implementation mechanism of the BHB. The second heading presents the average influence level of different actors involved in the process. Finally, under the third heading, the governance challenges faced by both supply and demand-side stakeholders are pointed out.

4.5.1 The Step by Step Microcredit Implementation Process of BHB

Figure 4 reveals the findings of aggregated 3 PNMs depicting how the BHB implements its credit program step by step. All the three maps revealed almost the similar pattern which identified a total of 12 actors and 21 processes. Some of the procedures were needed only during the initial phase of the project approval. The BHB still has the connection with those stakeholders in case any emergency issues come in front that needs to be dealt with them.

As noted earlier, BHB is a public organization who is the sole authority to perform multiple activities for the development of handloom sector in Bangladesh. As a part of those entrusted activities, it conducted one census in 1990 in cooperation with Bangladesh Bureau of Statistics (BBS). The survey aimed to keep a precise and detailed record on handloom sector such as the number of labor force involved in this sector, the number of establishments (looms), ownership status, investment requirement, access to credit and sources of finance and so forth. According to that census, out of total 501,834 handlooms within the country, 184,808 remained unproductive due to the shortage of capital during 1990. The survey also reported that many of the small-scale weavers were leading an inferior quality of life due to the lack of credit assistance. On an average, this sector required about 40 million USD as a credit to come out of this situation (BHB, 1998, p. 2). Based on that census, the BHB proposed undertaking a microcredit project for the weavers' community in 1998 to the Ministry of Textile and Jute (MTJ). The proposal passed through two departments of BHB such as the Planning and Implementation Department (PID) and Monitoring and Evaluation Department (MED) for the viability assessment by MTJ. This process was indicated by step 1 in Figure 4.

After checking the viability of the proposed project, following step 2, the MTJ redirected the proposal to the Ministry of Planning (MP) for their inspection. Once the inspection was done, the proposal was further sent to the Executive Committee of the National Economic Council

(ECNEC) for the final approval (step 3). This stakeholder had the highest authority to finally judge and approve the development project depending on the long-term national interest of the country. In step 4, the order was given to the Ministry of Finance (MF) to undertake the necessary initiative for initial fund transfer. This was further informed to the MTJ through step 5.

In step 6, the command was given to CGA from MTJ to maintain a separate account for BHB to keep a record of government's fund movement. The MTJ also passed this information to BHB and handed over the necessary documents so that the BHB can start preparing for receiving the fund (step 6). Upon receiving the approval papers, the BHB opened its bank account to BKB and RAKUB in step 7 and agreed with these banks that they will perform the loan disbursement and collection activities on behalf of BHB while in return, they will be given 2% service charge. Upon making such agreement, BHB communicated with the MF to finally transfer the money to the BHB's account to BKB and RAKUB. This step was also numbered as step 7. Once the MF performed the fund transfer in step 8, the next step 9 implied disseminating this information from central BHB office to 30 different basic centers. These were the processes that were followed during the initial phases of the project approval. As the project is still running, the following steps are followed until the credit is finally disbursement to the beneficiaries.

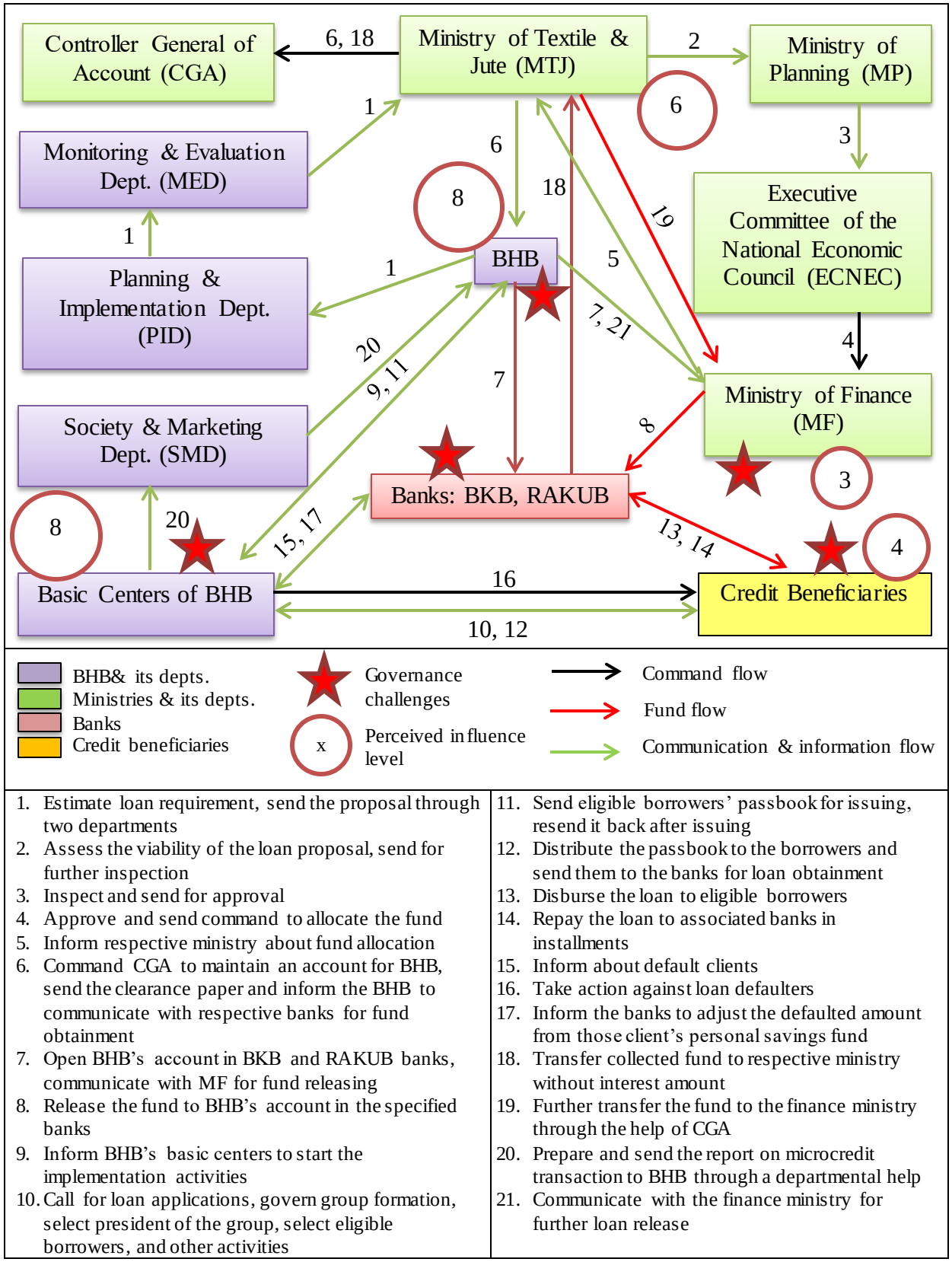
Based on the fund obtainment, the basic centers start the main implementation activities such as calling the loan applications from the borrowers, governing the process of group formation, selecting the presidents of the weavers' group and finally selecting the eligible borrowers. In doing so, a continuous communication is maintained between the basic centers and the clients. This lengthy process is marked by a single step 10 and is considered as the very crucial step of this program.

Step 11 indicates the processes of issuing the pass books of the selected borrowers by the chairman at the central board. Once this is done, the borrowers are provided with their passbooks and are informed to obtain the credit from the specified bank's branch within three days (step 12). The loan obtainment and loan repayment process is accomplished in steps 13 and 14. In case the borrowers fail to repay their monthly loan obligation gradually for three times, through step 15, the banks inform the basic centers about those defaulted borrowers so that the centers can take action against those clients to ensure the higher loan collection following step 16. Even after that, if the borrowers fail to repay on-time, the basic centers instruct the banks to adjust the loan obligations of those defaulted clients from their savings

account already created during the process of borrower selection. This step is further recorded by number 17.

At a certain interval, the credited amount is deposited to the MTJ by the banks while through the help of CGA, this transaction is recorded and further transferred to the MF as a repayment to the government. It is important to note that the banks transfer only the actual fund received from the state except the interest amount. The interest income is further deposited to the revolving fund of BHB which is used for expanding the outreach of the program instead of being dependent on only government fund. These processes were numbered as 18 and 19.

On the other hand, through step 20, the microcredit transaction reports prepared by the basic centers are submitted to the BHB on a monthly basis through the Society and Marketing Department (SMD). This process helps the central BHB in keeping track on the whole process, determining the further loan requirements, the outreach and success of the credit programs, and so forth. Based on that report, the BHB further communicate with the MF to release the next installment amount through step 21. Basically, this is the last step of implementation cycle. The second cycle is continued from step 6 and again ends at step 21.



1. Estimate loan requirement, send the proposal through two departments
2. Assess the viability of the loan proposal, send for further inspection
3. Inspect and send for approval
4. Approve and send command to allocate the fund
5. Inform respective ministry about fund allocation
6. Command CGA to maintain an account for BHB, send the clearance paper and inform the BHB to communicate with respective banks for fund obtainment
7. Open BHB's account in BKB and RAKUB banks, communicate with MF for fund releasing
8. Release the fund to BHB's account in the specified banks
9. Inform BHB's basic centers to start the implementation activities
10. Call for loan applications, govern group formation, select president of the group, select eligible borrowers, and other activities
11. Send eligible borrowers' passbook for issuing, resend it back after issuing
12. Distribute the passbook to the borrowers and send them to the banks for loan obtainment
13. Disburse the loan to eligible borrowers
14. Repay the loan to associated banks in installments
15. Inform about default clients
16. Take action against loan defaulters
17. Inform the banks to adjust the defaulted amount from those client's personal savings fund
18. Transfer collected fund to respective ministry without interest amount
19. Further transfer the fund to the finance ministry through the help of CGA
20. Prepare and send the report on microcredit transaction to BHB through a departmental help
21. Communicate with the finance ministry for further loan release

Figure 4: Integrated PNM showing the microcredit implementation process of BHB

Source: Author

4.5.2 Perceived Influence Level of Different Actors in the Microcredit Implementation Process of BHB

In addition to the identification of different actors and the linkages between them, Figure 4 also displays the influence that different actors had on the outcome achievement. It was perceived by the respondents of PNM exercises based on their understanding of the whole process of fund transfer from the supply-point to the demand-point. As the respondents' opinions varied in assigning the influence level, Table 9 summarizes the average influence level of only those actors who were perceived to have at least some influence. While calculating the average, the fractional values were considered as a round figure if the mean weight was close to the nearest integer number.

The interviewee ascribed both central BHB and its basic centers as the most powerful actors (influence level = 8) in the process of fund flow. One reason for such influence was due to BHB's continuous communication with different ministries for the approval and obtainment of the fund which largely determined the program uptake. Another reason was that the decisions taken at the central level are carried out at the basic centers by the liaison officers and field supervisors. Therefore, the successful delivery of the services depends on how efficient are they in performing their associated roles and responsibilities. The following highest influence level of 6 was assigned to the MTJ because they had the power to prioritize and approve the project, extend the project period, and ensuring timeliness in the fund flow. The willingness of the borrowers to participate in BHB's microcredit program and their loan repayment performance was also important to determine the outreach and sustainability of the program. Their opinion was also perceived as vital for the program's improvement. Therefore, the beneficiaries were perceived to have the third highest score equals 4. Finally, the lowest score equals 3 was ascribed to the roles played by the MF as their slow response to the fund release potentially lengthened the fund transfer to the clients. Therefore, it can be said that better program implementation is mostly influenced by the central BHB and its regional offices.

Table 9: Average influence level of different stakeholders in the credit implementation process of BHB

Actors	Mean influence level
BHB	8
Basic centers of BHB	8
Ministry of textile and jute	6
Credit beneficiaries (i.e., weavers)	4
Ministry of finance	3

Source: Authors own computation

4.5.3 Governance Challenges of BHB's Microcredit Program

The governance obstacles of BHB's microcredit program have been indicated in Figure 4 by the star sign. The study has analyzed those challenges from two perspectives: the supply-side and the demand-side. In fact, the demand-side difficulties are disclosed to address the supply-side problems. The findings obtained through the empirical analysis are supported by the narratives of KIs from both sides. This process ensures the reliability of the data and findings.

4.5.3.1 Expert Views: Supply-Side Analysis

The governance of the program faced two main challenges from the supply side. The first one is related to the human, physical and capacity limitations of the organization required to complete the tasks under steps 10, 11, 12, 16 and 20 presented in Figure 4. Ahmed (2009) noted that the process of monitoring and supervision are intensive and costly tasks in microcredit program as it needs to ensure the banking services at the doorstep of its users. Therefore, it requires an adequate number of skilled staffs. Unfortunately, the study finding reveals that this process was profoundly disturbed by the lack of an adequate number of employees at the basic centers. One of the KIs opined:

"The most critical problem for our program is the shortage of workforce. As per our project, each of the basic centers is supposed to have at least 4-5 persons to perform our credit activities. However, only two persons are working here. If you compare it with NGOs performance, you will find that at least 10-15 person is working at each of their branches. In that case, how can we provide the same service as they do?"[43]

[43] Interview with a liaison officer, November 20, 2016

Another KI added:

"Although we are advised to go for field demonstration about 10-12 times per month, we cannot manage to do so due to the shortage of manpower."[44]

Furthermore, the lack of both financial and non-financial incentives combined with the frequent transfer of the employees due to the political interference resulted in the negligence of the duties and responsibilities by them. The BHB also faced apparent challenge between operational efficiency and the quality of its human resources such as the skills and capacities required on record keeping, preparation of balance sheet, performance measurement, risk management and so on. However, the following statement clearly indicated the poor performance by BHB's employees as they lack such skills.

"We are supposed to provide training to the beneficiaries on how they can well manage their business through the proper utilization of loan. Sincerely, many of us are already lacking that quality. So, whatever training we provide, they are of poor quality"[45].

The competitive disadvantages of the studied program also appeared in the form of basic infrastructural inadequacies with regard to technological, communication and transportation facilities. For example, the lack of technological support such as the computer, printer, and the likes adversely affected the account maintenance as well as the report writing while miscommunication was correlated with the lack of telephone or internet use facility. On the contrary, the lack of transportation vehicle and insufficient travel allowance rather than good roads increased the tendency among the managers and field supervisors to neglect the random field visit in screening out the loan use. This problem further facilitated the refusal of loan repayment by the borrowers. A very dissatisfying insight was provided by a respondent about these challenges as follows:

"Look at our office. Do you see any computer, telephone or other resources here? Can you imagine an office without computer and internet service nowadays?"[46]

Another respondent revealed:

"We are not provided with any transportation vehicle such as a motorcycle or even cycle. Although we get travel allowance, it is really insufficient as compared to the cost we incur for field visit purpose."[47]

[44] Interview with a field supervisor, November 22, 2016
[45] Interview with a liaison officer, November 30, 1016
[46] Interview with a liaison officer, November 20, 2016

The second kinds of challenges are associated with the microfinance policy, operational and regulatory constraints. The most important one is the shortage of fund to execute the program. The political instability, as well as the constant change in development policy, was the main reason for the lack of initiatives in increasing the fund allowance from the government. In this regard, a very detailed insight was noted as follows:

"Our program is largely affected by the shortage of fund. As you know our country's perspective, the government changes very frequently. When a new government takes over the authority, it either abolishes the institutions established by the opposition government, or reduces their focus from there. The same happened in our case. Fortunately, the government has not abolished the organization; however, it never increased the fund for this program. Now, we are running this program using the revolving fund generated through interest earning."[48]

A common picture of the public bureaucratic system is the corruption, frauds, and forgeries due to the absence of or weak governance practice in the system (Acha, 2012; Boateng, 2015). This evidence was also found in the fund flows under step 8 and 21 (Figure 4). The following narratives cited by a KI can be presented against this claim:

"We receive our fund in installments from the MF. However, in order to get the money, most of the times we need to convince the associated personnel in the ministry […….]. Otherwise, the process gets more delayed."[49]

Although many studies (e.g., Kono and Takahashi, 2010; Cubero et al., 2016) have elicited the importance of informal credit sources such as friends, relatives, etc. in meeting the credit demands of the beneficiaries in the absence of collateral and in times of urgency, their presence was regarded as a challenge not only for BHB but also for other credit institutions available in the study areas. These sources were also responsible for creating competition among MFIs and with formal and semi-formal banks in terms of offering big sized loan while the microcredit programs are generally constrained to providing the same by its definition. Even, multiple debt trap issue was also reported by one of the respondents as verified by the following narratives:

[47] Interview with a field supervisor, November 28, 2016
[48] Interview with a liaison officer, November 24, 2016
[49] Interview with a program manager, December 31, 2016

"The handloom weaving sector is mostly controlled by middlemen, who provides larger loan amount than ours against a higher interest rate. However, most of the weavers are uneducated who do not understand this. Sometimes they seek for the further loan in order to repay this big sized loan. Therefore, they are never able to come out of the debt trap."[50]

Morais & Ahmed (2011) and Zaman (2013) mentioned that the inherent nature of most of the borrowers is to misuse the credit for unproductive purposes. In addition to this problem, the borrowers' absence or even the unfriendly behavior particularly from the defaulted borrowers' side during the time of field demonstration was regarded as an implementation challenge for BHB. This problem was related to the organizational disreputability as the result of such attitudes ultimately reflects the organization's failure in withdrawing the loan amount from the borrowers when it is evaluated by a third party. On this regard, the following was narrated by a KI:

"There is no way to bring a positive impact by the credit if the borrowers do not use it for productive investment [……][51]*. Sometimes borrowers play hide and seek with us. If they somehow guess that we are in their locality for field demonstration, they never show up their face. On the other hand, you will always find them at the branch office during the loan sanctioning process [….]"*[52]

Group-based lending is one of the main features of microcredit program. Several past and recent studies (e.g., Sharma and Zeller, 1997; Zeller, 1998; Njangiru et al. 2014; Kamanza, 2014) have proved this criterion as an indicator of success. It enables proper monitoring of the loan and higher repayment by the members. However, no positive linkage has been found by this study as the time wastage during the group formation process and complexity in maintaining the group's liability discouraged many eligible borrowers from participating in the studied credit program (under step 10 in Figure 4). Thus, the outreach was affected by this criterion. According to one of the KIs:

"Group formation is a lengthy process which motivates many eligible borrowers withdrawing their participation. Many of them are disqualified due to the failure of at least one member in keeping the group's promises."[53]

[50] Interview with a liaison officer, November 31, 2016
[51] Interview with program manager, December 31, 2016
[52] Interview with a liaison officer, January 1, 2017
[53] Interview with a field supervisor, November 22, 2016

In addition to the above challenges, when bankers were asked to express their experience in working with BHB and the probable challenges they face from their side, one of them refused to comment on this issue while other one suspected about the lack of proper administration of the studied credit program.

At the end of inquiry, a KI was directly questioned if this program is failing to address all these challenges on an immediate basis from the government, why the scheme is still running? While answering, the respondent acknowledged that the studied microcredit program is non-profit oriented and could be seen as a support service from the government. Therefore, they are never accountable to the government if they fail to collect the loan money timely. That answer motivated the author to ask the following question: why that is so? A critical insight was gained on this issue as follows:

"The government wants to maintain a good image for the next election. Therefore, we are instructed to collect as much as we can without much force on the borrowers. The rest is regarded as a subsidy for the handloom sector development."[54]

The above statement implied two issues at a time: the unclear program definition and lack of accountability in the system.

4.5.3.2 Beneficiary Views: Demand-side Analysis

Several barriers were also highlighted from the demand-side which was limited to the processes of 10, 12, 13, 14 and 16 as shown in Figure 4 and described in section 4.5.1. They are elaborated in the following paragraphs:

The main problem reported by most of the beneficiaries was the inadequacy of BHB's credit in meeting their demand as required for their successful business operations. To fill up this credit gap, they needed to look for some other sources of the loan (mainly of an informal kind) whose terms and condition was not always favorable to them. As the application needed to go through several stages of formalities which made the process lengthy, the delay in loan obtainment was also reported as a beneficiary level challenge. It also facilitated the misuse of the loan. One of the credit beneficiaries narrated:

[54] Interview with a liaison officer, January 5, 2017

"On an average, I required investing 385-513 USD on each handloom machine while I applied against 3 units. However, I was granted the credit for only 2 units amounting 333 USD equivalent to the money required to meet half of my cost of production hardly. It took almost 4-5 months when my need was already met by undertaking credit from Mahajan[55]for which I had to agree that I will not sell my products on the market except him. In the end, it did not help me"[56].

Pursuant to the fact that the borrowers were provided with less amount of credit than what was granted, it induced them to believe that the organization was cheating them. In fact, they thought that to get the access to the studied credit program; they should allow that money as bribery to the officers. In support of this finding, the following statement can be presented:

"I was granted 167 USD as credit. However, I received 141 USD only. I do not exactly know why that was so? Most probably, the officers consumed it"[57]

The absence of adequate basic centers and bank branches at the studied villages resulted in a higher opportunity cost of loan collection by the borrowers such as time wastage and energy loss while traveling. Therefore, it was also regarded as a demand-side challenge. Apart from that, lack of adequate non-financial support services was also missing from BHB which should not be the case for a typical microcredit program. For example, the advice on loan use, training, and workshop on knowledge and skill development, the information on how the BHB's credit program works and under which condition, how is it different from the other credit programs and so on was not in place. About the opportunity cost, one of the KIs narrated:

"Normally, per day I produce two cloths. The market value for them is nearly 8-10 USD. However, each time I visit BHB's office or bank, I cannot work for the whole day [.....] Sometimes the meeting was terse, but I had to wait for few hours [……]"[58].

About the support services, the following statement can be put forth as opined by a client:

"I am under this program since 2005. Except for two times credit allowance, I never received any training or other facilities."[59]

[55] An informal credit source
[56] Interview with a credit beneficiary, December 3, 2017
[57] Interview with a credit beneficiary, December 8, 2017
[58] Interview with a credit beneficiary, December 3, 2017
[59] Interview with a credit beneficiary, December 15, 2017

In line with the supply-side stakeholder, the beneficiaries' views regarding the group formation policy were proved unnecessary for BHBs credit case. Majority of the credit users remarked it as a lengthy and time-consuming process as evidenced by the following statement:

"As a vice-president of a group, I am obliged to be present at each weekly meeting. However, it is not always possible for me as it is very time-consuming. My loan is my responsibility. So, if I do not spend my time on my business, no income will be generated, and nobody will repay it back on my behalf [.....]"[60]

4.5.3.3 Contradictory Issue between the Demand and Supply-side Responses

This study has identified a contradictory issue from the response of supply-side stakeholders regarding the beneficiary-level corruption experience. As opposed to the insight gained from statement number 57, one of the supply-side KIs was questioned to clarify whether there is any connection between bribery and access to credit. In return, the respondent immediately rejected the claim and provided a very brief justification on that issue as recorded:

"*No, no. That is not true. Yes, we require some money from them before disbursing the credit. However, that is not for bribery purpose. That is for their personal savings account where they need to deposit a small portion of the money to meet the eligibility condition. In case, the eligible borrowers fail to deposit that amount, we cut that money from their credit, and they get the rest. An emergency fund is also created similarly. As we do not require any collateral, these funds act as security for the defaulted borrowers. But see, what they think about us. It is amusing."*[61]

This argument guides this study to conclude that there was a substantial lack of transparency between the lender and the receivers of credit.

[60] Interview with a credit beneficiary, December 9, 2017
[61] Interview with a liaison officer, April 15, 2017

4.6 Discussions and Policy Recommendations

The study has revealed several interesting, contrasting and surprising findings regarding the governance challenges of a government-funded credit program in Bangladesh through a case study approach. They are discussed as follows:

Consistent with the results of Marais and Ahmed (2011), Acha (2012) and Boateng (2015), it can be concluded that the major implementation bottleneck of public microfinance programs roots from the human, physical and capacity limitations of the organization. The shortage of workforce makes the process of loan screening complicated at the field level. In addition to that, the insincerity in performing the associated duties and responsibilities is correlated with the incentive provision of the employees. The lower level of this variable reflects the less work motivation by the staff. On the other hand, the limited capacity building opportunities for both suppliers and the users of credit constraints the operational and loan use efficiency. All these problems might be related to the inability of the organization to recruit and train the qualified technical staff which most of the public agencies fails to provide so according to the budget limitation. In Bangladesh, most of the public projects and programs are influenced by political power. This adverse influence sometimes transfers many of the employees from a particular area which breaks down the trust and relationships between the lender and the borrowers developed over the time. Ultimately, it affects the loan collection efficiency initiating the failure of the organization.

The above problems indicate that the mere declaration of providing the social or financial services is not possible as long as the problem of manpower and capacity building are not solved. Besides it, the organization should ensure that both the management and staffs can respond quickly to a specific issue. In doing so, it is suggested to strengthen both internal and external accountability system. The government should also ensure the proper functioning of the Microfinance Regulatory Authority (MRA) that will not let the organization to be affected by the political influence.

The physical handicap of the organization with regard to technological, transportation and communication facilities makes the microcredit practices complicated from both supply and demand side. In fact, it increases the operational and opportunity cost of loan collection which also finds the consistency with the authors mentioned above. Therefore, the organization should improve the physical infrastructure as well as the endowment of resources so that door-to-door services can be quickly provided to make the communication process faster.

In public credit programs, the outreach is most afflicted by the shortage of public fund. However, this mainly happens due to the frequent change in government and the policy as is the case in many developing countries. Such instability hampers the operational flexibility as the organization needs to adjust to the new environment. This finding is found to be quite similar with Abdelrahim (2014) and Dahir (2015). Unlike the findings of Acha (2012), Boateng (2015) who noted that many poor populations are tended to borrow money from the informal sources only in the absence of banking culture, this study has found that even though the banking culture is prominent in Bangladeshi villages, yet, the borrowers require credit from the informal sources. The inadequacy of the credit, limited accessibility due to several formalities and delay in fund obtainment are thought to be the primary reasons behind this. Even though this credit can meet the borrowers' urgent need, they are regarded as untrustworthy and expensive by many of the authors such as Kono and Takahashi (2010) and Cubero et al. (2016). Therefore, the claims of multiple debt trap and creation of competitive environment mentioned from the supply-side regarding the presence of these informal sources might be supported by these studies.

The inherent nature of the borrower is to misuse the credit for household consumption or other unproductive purposes than investment as has been condemned from the lender's perspective. Perhaps the smaller sized loan and delay in loan transfer can again be reported as the reason behind such attitude. This finding is slightly different with Dahir (2015) who accused that it is the borrowers who do not understand the meaning of microcredit. Therefore, they require a large amount of credit that does not fit within the budget allowance from the government. Any of these reasons can act as a threat to the public programs. These findings lead to the recommendation that the fund should be increased for both suppliers and users of credit and if possible, the process should be made faster for the smooth microfinance operations.

This study criticizes the finding of Sharma & Zeller (1997), Zeller (1998), Morais & Ahmed (2012), Njangiru et al. (2014), and Kamanza (2014) regarding the joint liability of repaying the loan. More plainly, the in-depth analysis reveals that the policy of group-based lending is unnecessary pertaining to the time wastage in forming and maintaining the group's liabilities. Although this finding is similar with Kaboski and Townsend (2005) and Asgedom et al. (2015), yet, it is thought to be more specific for the studied case by the authors of this study. A bottom-up planning process might help the organization in adopting a user-friendly policy

of borrower selection other than group formation criterion that will not require considerable time wastage.

The lack of proper administration and supervision of public programs from the central authority highlights the corruption in the fund flows. However, the study finding reveals that there is substantial lack of transparency between both parties concerning this issue. Therefore, this study recommends for the initiatives such as conducting workshops and seminars in the study villages where how the BHB's credit program is implemented and under which condition would be made clear to the beneficiaries. Field demonstration process can also be strengthened by increasing the transparency. Most importantly, internal governance structure should be reinforced so that the corruption issue can be controlled. This finding is in line with Zaman (2013).

Another important finding of the study can be generalized as that not all the public program aim to achieve financial viability. Some attempt to support a particular segment of the population, for example, the studied beneficiaries in an emerging need. If that is the case, then it needs to have a clearly-defined framework so that it can guide not only the management staff about what to do but also the researchers and development planners to evaluate the program properly and come up with a better policy that is consistent with the program type. For example, the study findings raised confusion whether the studied case is precisely a microcredit program or subsidy program. If the government wants to support the handloom weavers, one of the appropriate policies could be a direct cash transfer rather than making the process more complicated by the name of microcredit.

From the above discussions, it can be concluded that none of the programs is free of challenges. They might be interrelated and interchangeable among any of the public programs implemented in developing countries. Therefore, the organization should understand the nature and consequence of each challenges and design appropriate strategy to minimize them based on the suitability of the study focus.

4.7 Conclusion

There is no doubt that the expansion of microfinance sector still has great potential for the social and economic development of its beneficiaries in Bangladesh and also all over the world. However, a poorly designed program can even bring very little or no outcome, rather debt trap can grasp the household. Therefore, a lot is still needed to add to the literature through in-depth qualitative research in examining the organization specific crisis making factors rather than just reviewing the existing literature that is not consistent with all organizational structure. In this regard, this study is one of the comprehensive studies which have studied the implementation challenges both from the supply-side and demand-side employing a participatory mapping tool. Its contribution to the literature is both on the subject matter as well as it is a problem-solving attempt.

4.8 Acknowledgement

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5 Discussion, Policy Implication, and Conclusions

In the era of rapid proliferation of microfinance as a strategy of rural development, this thesis has discussed whether government credit should be promoted over NGOs credit. It has evaluated three aspects of the non-agricultural government credit program in Bangladesh with the case of BHB's microcredit scheme. These three key areas of inquiries are investment impact of BHB's credit program, repayment performance, and governance challenges. The second quantitative study is guided by the impact estimation of the first, whereas the third aspect is based on the justification of the second with a different analytical approach (qualitative). In this chapter, linkages between the three studies are discussed following a comparative approach to past studies. This discussion helps generate emerging themes in drawing a conclusion and highlighting the direction to which this study contributes to the existing controversial impact assessment literature as well as which knowledge gaps the study fills. In the end, it sets policy implications based on the main conclusion derived from the discussion section.

5.1 Discussions of the Findings of the Study

5.1.1 Insignificant Impact of the Public Credit Program

Chapter 2 and 3 analyze whether the access to BHB's credit scheme, proxy for the public microcredit program, supports timely investment and repayment decisions of non-agricultural handloom weavers in Bangladesh. The main finding implies that government credit does not help foster investment in handloom weaving business (Table 4). This finding is quite disappointing; however, it is in line with Kohansal et al. (2008). On the other hand, it contradicts with many other studies such as Gelos & Werner (2002), Petrick (2004), and Love and Sánchez (2009), who estimated a positive relationship between investment and credit. Several possibilities exist for such assessment. The more plausible explanation could be the minimal credit volume which failed to bring major changes to the household outcome. Godquin (2004) and Awunyo-Vitor (2012) justified that if the loan size is very small, it might have little consequence on the business activity as the insufficient amount may not enable the borrowers to meet their cost of production. As a result, borrowers may get loan from multiple sources. In those cases, the general tendency of the borrowers would be to default their repayment. The validity of such impact estimation can also be settled by the quantitative analysis of repayment performance in Chapter 3 and the in-depth qualitative analysis in

Chapter 4. The repayment analysis confirmed the significance of loan size as well as loan utilization for reducing the probability of repayment default (Table 7). This confirms the plausibility of studies by Oladeebo and Oladeebo (2008), Afolabi (2010), Onyeagocha et al. (2012), Nawai and Shariff (2012), Shu-Teng et al. (2015) and Awunyo-Vitor (2012). However, this finding deviates from the studies by Godquin (2004), Papias and Ganesan (2009) and Osondu et al. (2015). The governance analysis also identified the inadequacy of fund as both supply-side and demand-side challenges of the studied credit program (statement 48 & 56). Authors such as Abdelrahim (2014) and Dahir (2015) also noted the same as this study. Therefore, this study finds consistency with these authors regarding the shortage of funds as a major obstacle in implementing the program. The in-depth analysis also provides insight into the reason for such shortage of funds in public credit program. In developing countries, the frequent change in government and policies is identified as responsible for creating budget constraints in public credit programs such as BHB's credit scheme (statement 48).

5.1.2 Significant and Negative Influence of the Multiple Financial Opportunities

Given that borrowers often receive credit from multiple sources, this study took into account of the household's access to different formal, semi-formal, and informal credit institutions for the impact and repayment performance analysis in Chapter 2 and 3. Literature (e.g., Kono and Takahashi, 2010; Acha, 2012; Boateng, 2015) suggest that poor borrowers' lending opportunities are enhanced by such credit provisions on the one hand. On the other hand, multiple credit sources create multiple debt traps for defaulted borrowers by allowing them to enhance the chance of obtaining further credit. Unfortunately, this study finding prefers to believe the latter as access to multiple sources of credit other than the studied credit public program is also found to be significantly but negatively affecting the investment decision (Table 4). From the repayment perspective, this variable does not even increase the probability of successful loan repayment (Table 7). Therefore, in line with Diagne and Zeller (2001), this study justifies the fact that when borrowers are obliged to repay multiple loans with interest, their economic condition becomes worse off. In that sense, it can be said that multiple credit accesses do not really help the borrowers; instead, they put borrowers under multiple debt traps or a vicious cycle of poverty. This finding suggests providing another explanation for such credit impact: easy entry and exit criteria of these institutions, which facilitated a weaver's self-selection into the program. This self-selection problem arises when

the program does not randomly select program participants. Whatever the reasons are, it undermines programs performance.

Focusing on informal credit sources, this study finds a mixed effect of this financial source from the governance analysis in Chapter 4. From the supply side, the availability of these sources is regarded as a challenge not only for the government-run BHB's program but also for the other credit programs in the study areas in terms of creating competition. However, the study finding from the demand-side analysis does not support this view. In fact, it proves that informal sources of credit are crucial for the timely investment decision of the handloom weavers in Bangladesh. The reason, which is supported by Kono and Takahashi (2010) and Cubero et al. (2016), is that the process of loan obtainment is easier and quicker than for any formal credit programs, which, in turn, helps borrowers to meet their urgent need in the absence of collateral. However, the terms and conditions of such loans were very unfavorable for the borrowers. Therefore, the danger of multiple debt traps needs to be accepted, which is in line with the findings by Kono and Takahashi (2010) and Cubero et al. (2016).

5.1.3 Significance of the Household Asset on the Outcome

With regard to the quantitative estimations in Chapter 2 and 3, household's asset possession is found to be positively correlated with the dependent variables in these analyses (Table 4 and Table 7). Luan (2015) considered this variable as the wealth measurement criteria while many authors (e.g., Serra et al., 2004; Diagne and Zeller, 2001; Hohfeld and Waibel, 2013) reported that wealthier households are likely to invest more, which helps to expand the microenterprises in the absence of a perfect credit competition. Similarly, Ibrahim (2013) noted that wealthy borrowers are more likely to repay their loan than their counterparts. This study finds consistency with these ideas as both of the different analyses suggest that borrowers with better economic status are able to respond positively to investment and repayment performance.

5.1.4 Significance of the Operational Handlooms on the Outcome

Apart from availability of credit, the handloom-specific variable, which is the number of operational looms, significantly increases investment possibilities as well as repayment rate due to income earned from the increased investment decision (Table 4 and Table 7). This finding is according to the study's expectation. In the opposite manner, the number of the non-operational loom is identified as negatively affecting the investment decision, which also

supports the research idea that as many units of production remain unproductive, less money needs to be invested in the business. This finding cannot be compared with any past studies as it is more specific to the handloom business.

5.1.5 Consequence of the Distance between the MFIs and the Study Villages

Both the quantitative and qualitative analyses presented in Chapter 2, 3 and 4 reveal that high transaction (e.g., application fee, travel cost) and opportunity costs (e.g., time wastage, energy loss) of loan collection were mainly associated with the distance to BHB's branches from the borrower's community. Several authors such as Chauke et al. (2013) and Ibrahim (2013) noted that such increased transaction cost reduces the marginal value of credit and consequently the investment level. When lower investment results in lower income, it cannot be expected that borrowers will make on-time repayment. Long distance to BHB branches might also discourage borrowers to participate in the BHB's credit program. Therefore, this study agrees with the aforementioned studies as the estimated coefficient is significantly negative for the distance variable with regard to investment impact and repayment performance analyses (Table 4 and Table 7). However, the opportunity cost effect of repayment performance analysis was quite unanticipated as the estimated positive and significant sign of this variable explains that the likelihood of loan repayment increases with the increase in opportunity cost (Table 7). Even though this finding is not as expected, the study by Anigbogu et al. (2014) can be referred for supporting this finding. Contray to such findings, Awunyo-Vitor (2012) and Osondu et al. (2015) claimed that the monitoring, supervision and additional service delivery are difficult in the villages situated far away from the credit institution. Such outcome is evident even from the governance analysis (Chapter 4), where the study examined opportunity cost issue and the lack of adequate non-financial support services (e.g., training, workshop on knowledge and skill development, the advice on loan use and so on) as one of the demand-side challenges. From the supply side, distance was indirectly linked to poor screening of loan use at the field. For example, to provide services to program villages, officers and field demonstrators from basic branches required travel allowance or transportation means. However, such incentive was inadequate for them to carry out the activities. In that situation, misuse of loan or even loan default could be an obvious outcome. Therefore, this study finds consistency with Awunyo-Vitor (2012) and Osondu et al. (2015), while it diverges with Nawai and Shariff (2012) and Haile (2015).

5.1.6 Significance of the Productive Loan Utilization

The significance of loan utilization cannot be neglected regarding its positive effect on household outcome. However, in line with Morais & Ahmed (2011) and Zaman (2013), who accused the unproductive use of loan as the inherent nature of the borrower, the governance study (Chapter 4) identifies this attitude as a challenge from the lender's perspective (statement 51). If the study assumes this statement as true, the reason for such misuse can be the reason for smaller loan size and delay in loan obtainment, which has been clear from the demand-side analysis (statement 56). However, this view is quite contradictory from the quantitative analyses discussed in Chapter 2 and 3. The descriptive analysis of this dummy variable from both chapters shows that majority of the borrowers utilized their credit for productive purposes (Table 2 and

Table 6). However, the impact assessment study did not find any statistical significance regarding this variable (Table 4). Regarding productive loan utilization and repayment performance, the repayment analysis implies that borrowers who productively utilized the credit in their businesses had a higher probability in successful loan repayment (Table 7), which confirms the earlier study by Papias and Ganesan (2009). At this point, it is noted that each of the estimation methods has potentials and challenges. Therefore, such different influence of the same variable in three different analyses might have resulted from the methodological variations of the study.

5.1.7 Inefficiency of the Group-based Lending Policy

Many earlier and recent studies have proved the group-based lending policy as an important criterion in ensuring organizational sustainability. The usefulness of such organization was thought as helpful not only for the lending institution in ensuring higher repayment but also for the social benefit improvement of the members in the form of mobility, social networking, market information sharing and so on. However, the estimation result in Chapter 3 (Table 7) and the intensive analysis in Chapter 4 both (statement 53 & 60) highlight the inefficiency of this criterion for the studied program. Given that handloom weaving is a labour-intensive practice involving manual production, formalities of group formation and maintenance of group's liability were regarded as a time-consuming and lengthy process from both supply and demand-side analyses. Even in the repayment analysis, the model generated a negative sign for this variable (Table 7). Therefore, this study diverges from the findings by Sharma & Zeller (1997), Zeller (1998); Morais & Ahmed (2012), Njangiru et al. (2014) and Kamanza

(2014), while it is consistent with the findings from Kaboski and Townsend (2005) and Asgedom et al. (2015). However, it should be noted that this finding might be more specific to the studied case since credit programs targeting other group activities may not be manual and labour-intensive like handloom weaving. Therefore, it requires some changes in this policy, which is suggested in section 5.2.4.

5.1.8 The Consequence of the Absence of Monitoring and Supervision System

According to Papias and Ganesan (2009), a good lender-borrower relationship helps in ensuring higher repayment rate, which is dependent on the effectiveness of the loan monitoring and supervision system from the lender's side. However, it has already been discussed in the preceding paragraphs that the loan monitoring process was compromised by the distance between the program villages and the MFIs in this study. Another reason for such ineffectiveness can be indicated by the lack of adequate manpower. Authors such as Ahmed (2009) emphasized the need for adequately skilled manpower in efficiently delivering the available banking services to the borrowers. The descriptive analysis presented in

Table 6 of Chapter 3 also reflects the same. The table represents the perception of the majority of the borrowers (60%) regarding the absence of a monitoring system in the studied credit program. Even though the final model's estimation failed to identify this variable as a significant determinant of loan repayment, the plausible linkage between the lack of manpower and the absence of a monitoring system cannot be denied (compare the findings regarding the impact of BHB's credit in Table 4 and the repayment rate in Table 7).

5.1.9 Independent Effects of the Variables in Different Analyses

Apart from these interconnected factors, borrowers' characteristics as well as the lenders' independently contributed to the individual studies conducted in this thesis. For example, the number of adult family members positively affected the loan repayment performance, while occupational status, work experience, and income variables negatively affected the loan repayment performance of the studied borrowers (Table 7). Being a labor-intensive work, it was thought that an addition of an active member of the family would be helpful for the handloom business. The model has estimated exactly the same; thus, this finding can be supported by Haile (2015). Even though multiple occupational statuses were thought to be positively related to repayment rate, the estimated negative sign effect can be explained as multiple activities diverting labor from manpower-based handloom weaving. This reduced

effort in the business results in lower production, which leads to lower income, eventually failing to meet repayment schedule. This finding deviates from Haile (2015), which estimated a positive correlation between multiple occupations and loan repayment. Similarly, the negative effect of work experience on repayment rate can be justified by the fact that a substantially experienced borrower has already realized the full potential of his business and is no more interested in investing his credit into the same business. Rather, he is interested in consuming or investing in luxury or durable goods such as land, jewelry and so forth, which do not bring immediate returns on their investment. That is why the sign of work experience variable is estimated as such in this study. This finding is also contradictory with several recent studies by Oladeebo and Oladeebo (2008), Afolabi, (2010), Onyeagocha et al. (2012), Shu-Teng et al. (2015) and Haile (2015). Finally, the sign of the income variable was also unexpected as the study believed that an increase in income would increase the likelihood of on-time loan repayment. The probable reason for such estimation could be the higher cost of production than the level of income earned from the handloom business. The result is supported by a number of recent studies such as Afolabi (2010), Nawai and Shariff. (2012), Bhatt and Tang (2012), and Anigbogu et al. (2014), while it is in strong contrast with Osondu et al. (2015).

Some additional factors are also identified as responsible for the governance challenges of the credit program. Marais and Ahmed (2011), Acha (2012) and Boateng (2015) generalized human, physical and capacity limitations as major implementation bottlenecks of operating a microfinance program. This study finds consistency with these studies as these constraints were also evident in the studied credit program. The work environment, such as poor physical and infrastructural facilities (e.g., limited office space, lack of computer and internet service, and othrs), combined with the lack of capacity-building initiatives (e.g., training), demotivated officials to perform their roles and responsibilities properly (statement 46 & 47). Further, the absence of performance incentives such as award or present after a task completion, salary raise, and the likes were included in the problem. In addition, the credit program was susceptible to political power in terms of the process of employee transfer, which was responsible for compromising a good lender-borrower relationship which had developed over time. Corruption in the fund flow was also evident from the responses of both sides (statement 49 & 57). However, evidenced in statement 61, supply-side respondents rejected the demand-side claim (statement 57) regarding the bribery issue. Such contradictory statements clearly indicate that there was a substantial lack of transparency between lenders and borrowers regarding the principles and practices of credit implementation by the studied

credit program. Once again, such incidence indicates an organizational failure to implement a program in a way that such contradiction never arises between the two parties; statement 54 highlighted the problem of accountability in the system. Finally, this study crucially identified that it is actually the government who does not really want the employees to be accountable for their poor performance in order to maintain a good image for the next election within the handloom community. Statement 54 raises similar concerns from the discussion section 2.5 of impact study in Chapter 2. The first concern is whether the studied credit program should be regarded as a subsidy program or purely a microcredit program. If the aim is just to support the handloom sector in Bangladesh, why does it need to make the process complicated by the name of microcredit? Do the borrowers need microcredit, subsidy, microenterprise credit or other support service like the direct cash transfer? These questions need to be intensively explored, and the program should come up with a clearly defined policy so that researchers and policy planners are not misguided in conducting their studies. These findings are somewhat in line with the authors cited throughout this study's discussion section.

An overall conclusion of the study is that the study findings are interconnected both within and between the factors in the three different analyses. However, their nature differs depending on the methodological approach and the ways of interpretations.

5.1.10 Results of Hypotheses Testing

The discussion above suggests that the government credit program investigated in this thesis did not significantly contribute to increasing the investment status of handloom weavers in Bangladesh (Table 4). Therefore, hypothesis 1 under objective 1 listed in Chapter 1 is rejected by this study. On the other hand, statistical significance of variables such as number of operational looms (positive), non-operational looms (negative), and distance (negative) (Table 4) implies the validity of hypothesis 2 tested under Objective 1.

Under objective 2, identifying loan size, the opportunity cost of loan collection and loan utilization as significant determinants of repayment performance (Table 7) implies the validity of hypothesis 3. That is, the institution-specific variables significantly influence a successful loan repayment decision of the borrowers. Testing hypothesis 4, it is also logical to say that the individual (e.g., work experience), household (e.g., occupational status, adult members, household asset, operational loom, income) and community-level (e.g., distance) variables either positively or negatively determine the likeliness of the on-time loan repayment (Table 7). Therefore, we do not reject hypothesis 4 under objective 2.

Finally, our findings provide supporting evidence for both hypotheses under objective 3. Our findings suggest that financial as well as non-financial services were scanty to the borrowers due to several implementation-related constraints under the government-sponsored microcredit program. Moreover, supply-side and demand-side challenges were interconnected explained in the discussion above.

5.1.11 Scope and Limitations of the Study

Studying the topic like microcredit, which requires multiple issues to be considered at a time, is challenging. Each of the methods used and its data collection process has limitations. These limitations are highlighted at the end of this thesis so that it can guide future research of similar kinds. It also portrays the scope of future research.

The first limitation is related to the case of BHB's microcredit scheme. The program's beneficiaries are handloom weavers whose credit requirements may differ from those of other non-agricultural occupations (e.g., rickshaw pulling, small business, and others). Therefore, the extent of credit impact estimated in this study can be regarded as more specific to the handloom sector in Bangladesh or other countries like India where this sector is prevalent. However, the finding may not be generalizable over all non-agricultural occupations.

In case of sample selection, the study classified the total samples into two groups as users and non-users of BHB's credit from the same credit-implementing villages. However, such selection can cause potential bias due to the possibility of spillover effects. Even though many authors suggest controlling this spillover effect by selecting a control group from villages without the credit program, such selection can also raise some research problems. For example, if the study selects a sample from non-treated villages whose socioeconomic characteristics are not similar to the treated group, such selection also leads bias to the estimated impact. This might be the reason for those villages not to be included under the studied credit program. To address this issue, one could use a panel dataset. However, the study also acknowledges the limitation regarding the panel data because there is not any baseline survey on the microcredit program of BHB. Therefore, the over-time impact cannot be speculated from this analysis as the study used cross-sectional data. Even the use of methods such as propensity score matching or difference-in-differences cannot be applied in this study due to this limitation. Hence, one can conduct a follow-up longitudinal study to assess the long-term impact of BHB's credit scheme.

The impact of credit may differ at macro and intermediate levels due to changes in lending policies or lender's ability. However, this analysis is limited to a micro level which considers the impact of credit to borrowers at the Sirajganj district only. Therefore, future research can be conducted at both macro and intermediate level involving the borrowers from 27 other basic centers of the studied case (i.e., BHB) to see the extent of impact.

For the credit information, there was a colossal mismatch of credit records between the the borrowers and the BHB's officials. The borrowers were afraid of showing their passbook where the credit records were listed; one of the two study centers did not keep a complete record after 2013. Therefore, the researcher had to depend on the information recalled from the respondents' memories. This incidence resulted in an estimation error of the credit amount in this study. However, the researcher technically asked the respondents how many times they received the credit, against how many handloom units in each time, and how much they have received per unit? Still, some of the information was missing that the researcher needed to adjust while analyzing. That is how the accuracy of the collected information has been ensured in this study.

The examination of governance challenges was a sensitive issue. Therefore, the KIs were very reluctant to provide information. Although the researcher promised to keep their identity secret, some of them still did not cooperate in verifying the accuracy of the collected information. Many even refused to record their responses or take photos. Due to this, the sample size for supply-side analysis was relatively small. Even though the small sample size is not the real issue for qualitative research, generalizing the findings regarding supply-side challenges may differ if it could have involved other KIs. One can check it through further research involving a larger sample size.

The PNM exercises were intended to know how the BHB's credit program is implemented. However, the diagram prepared could not be verified by BHB's central officials since it was not possible to ensure that they had sufficient time to examine all details that were revealed in the maps. Moreover, no clear documentation about the implementation process was also found in the project guideline. Therefore, understanding the implementing process depended on what the respondents knew about it.

During the data collection period, lending policies, such as increasing the loan volume, employee recruitment and other activities, were going through a revision. However, it was not approved by the government at the time. Therefore, those changes were not taken into account

while drawing a conclusion. Through a shadow price analysis of credit, one can evaluate whether an increase in loan volume increases the borrowers' outcome. Overall, we believe that acknowledging these limitations will guide future academic work in this area, but it appears reasonable to assume that the main findings and conclusions are nevertheless relevant and may guide policies, as further detailed below.

5.2 Policy Implications

The case study conducted in this study provides an insight into the nature and consequence of a government-funded microcredit program in Bangladesh. Even though this study does not establish a convincing output through different analyses, it does not neglect the potential role of microfinance in improving the welfare of rural non-agricultural households in Bangladesh. It just emphasizes the need for establishing a well-designed program so that the organization's resources are appropriately utilized and small-scale entrepreneurs such as handloom weavers are benefitted from the credit program. Therefore, some policy options are recommended for enhancing the impact, performance, and sustainability of state-driven microcredit program based on the discussion above.

5.2.1 Strengthening the Capacity of the Public Credit Program

An organization cannot be expected to provide quality services if it is constrained by human, physical, and financial resource endowments. Unfortunately, the overall discussion clearly underlines the limited capacity of the public credit program with respect to all three indicators. Therefore, the government should focus on addressing these issues before aiming at providing social or financial services to the poor.

Capacity training is equally important for both the credit program staff members as well as the borrowers. From an employee's perspective, training is important to enable them to provide quality services to the borrowers and to operate the credit program smoothly. From the borrowers' side, training is needed to help them manage their business and to adopt technology and innovative business ideas to enhance their financial capacity through microcredit. The idea is that financial help alone may not enable the business entrepreneurs to deal with all the difficulties. They require additional training on business skills. Therefore, MFIs should create provisions for such facilities.

5.2.2 Strengthening the Monitoring and Supervision System

A more promising approach to control the misuse of funds could be tightening up the monitoring process by employing adequate, qualified workforce. Extension services could also be introduced that will provide innovative investment ideas to the borrowers.

5.2.3 Improving the Accessibility to the Credit Institution

The study findings discussed in section 5.1.5 indicate that outreach of the program is impeded due to accessibility constraints. Therefore, this study suggests solving this constraint by opening up more branches in the study areas. Improved accessibility will enable borrowers to find new opportunities for investment through their good connection to the MFIs. In addition, additional branches will facilitate the monitoring and supervision of loan use and the delivery of other services.

5.2.4 Revision and Reformulation of the Credit Implementation Policies

The revision and reformulation of the microfinance policy can take several forms. As discussed earlier and reinforced here, government-sponsored microcredit does not significantly influence the investment status of the handloom weavers. Therefore, a more sustainable way to promote investment would be introducing new credit lines not as microcredit, but as microenterprise credit to facilitate the adoption of power loom in the weavers' community. Furthermore, the credit should be delivered to only the constrained households through a randomized selection process so that the self-selection issue is also avoided. Thus, the process of structural change from a traditional, low productive handloom to a more productive and modern power loom will take place in the rural economy. Then, this change will improve the livelihood of handloom weavers. Otherwise, the current practice will never achieve its goal.

As the discussion in section 5.1.7 proves the current ineffectiveness of a group-lending policy, microfinance programs targeting to help handloom weavers should consider either abolishing current practices or introducing some innovative practices within the group so that the members do not consider it as a complicated and time-consuming process. For example, instead of a weekly meeting, a monthly meeting system can be introduced. The group leader can be trained in various business skill development, product positioning, and product differentiation and so on. Afterwards, the group leader can train each member gradually. It

may also encourage members to attend the meeting thinking that those who attend meetings will make more profit due to their acquired skill.

Even though the studied credit program claimed that their operational mechanisms are identical to the NGOs programs', the study findings do not really find those practices active in place. For example, Rahman et al. (2012) discussed that one of the reasons of the success of BRAC, ASA, and GB or other NGOs is the targeting of women borrowers, who are regarded as active participants than men and are more reliable in ensuring timely repayment. However, none of the respondents under the studied credit program is found to be a woman. In fact, it could be one of the reasons for studied credit program's failure. In this regard, it is suggested that the organization should revise their targeting focus, not necessarily to only the handloom owners (who are also the household head), but also the female members of the household. It is hypothesized that female members will also invest money in the weaving business. At the same time, they will actively attend group meetings than the male partners.

Even though the BHB's project guidelines (BHB, 1998, p. 5) note that weavers who receive credit from other financial sources would be ineligible to get credit from BHB, this criterion seems impossible to follow as borrowers have a common tendency to obtain credit from multiple sources. Therefore, either this criterion should be strictly followed in selecting eligible weavers, or it should be abolished to make the process easier and faster.

This study also suggests the need for an efficient credit program collaboration system between the government and NGOs so that the former can learn to operate sustainably while meeting the demands of the clients. Overall, there is an increasing need for the public credit program to design a better framework that is flexible, demand-driven, bottom-up, and participatory instead of a top-down enforcement approach.

5.2.5 Strengthening the Regulatory System

The issues of negligence of duties, corruption, accountability, political power, and the likes can be controlled by strengthening the internal and external governance structure. It can be done by ensuring the proper functioning of the Microfinance Regulatory Authority (MRA) initiated by the GoB in 2006. Also, MRA can play a role in making the formal processes of loan transfer faster so that the borrowers do not need to seek for informal credit, which is actually not beneficial to them. By doing so, an ineffective informal credit market can be controlled among the borrowers.

At the end of the policy discussion, the study concludes that the mere declaration of calling a program as microfinance is not easy. It requires skilled and dedicated professionals, adequate resources and incentives, an effective regulatory system, innovative approaches, and most importantly, an understanding of the targeted client's demand. Otherwise, such initiatives will contribute to the misuse of public funds in poor and developing countries like Bangladesh.

5.3 Conclusions

There is universal agreement among researchers and policymakers that poor rural households in developing countries are constrained by their access to finance. Therefore, many studies have given due recognition to the strategies for solving this accessibility problem. In the process, however, they have often neglected the importance of organizational sustainability for a sustainable and long-run livelihood improvement of the borrowers. Moreover, the sustainability depends on a range of socioeconomic, agroecological and institutional factors of both lenders and borrowers which require attention from a policy perspective. It also requires understanding the challenges faced by the credit program. Otherwise, the program may continue to provide inadequate services that will not improve the welfare, and instead, bring misfortune to the borrowers. Using microcredit as a potential instrument for rural development will entail complementary resources and economic ability of the organization in fulfilling the demands of the beneficiaries. It also requires creating an enabling environment where the borrowers would be able to hold the organization accountable. Moreover, all these activities need to be governed by an active regulatory authority so that none of the parties involved in the credit program can overpower the rules and regulations of the credit program. Accordingly, any credit program, public or private, can establish itself as a successful case.

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6 Appendices

6.1 Questionnaire for the Household Survey

On

Contribution of Non-agricultural Government Credit Program to the Livelihood Improvement of Handloom Weavers in Bangladesh

Questionnaire No.: Treatment group: Yes ( ) Control group: Yes ( )

Control group : Those who are under the microcredit program except BHB but have similar socioeconomic background like the treatment group

Treatment group : Those who are under the microcredit program of Bangladesh Handloom Board (BHB)

Date of interview: …… Signature of interviewer: ……

6.1.1 General Household Characteristics

6.1.1.1 Basic information of the respondent

Name	
Address: Village Upazila District	
Mobile no.	
Age (years)	
Sex	1 = Male, 2 = Female
Occupation	1 = Handloom weaving 2 = Crop farming (rice) 3 = Fisheries 4 = Livestock 5 = Agricultural wage labour 6 = Non-agricultural wage labour 7 = Service

	8 = Business 9 = Remittance 10 = Transportation/construction workers 13 = Others
Literacy level	1 = Can sign only 2 = Illiterate 3 = Primary 4 = Secondary 5 = Higher secondary 6 = Graduate and above
Family size (no.) Male (no.) Female (no.)	
Marital status	1 = Married 2 = Unmarried 3 = Divorced 4 = Widowed/widower
Religion	1 = Islam 2 = Hindu 3 = Christian 4 = Buddhist 5 = others

6.1.1.2 If the respondent is not the household head, collect the necessary information on the household head *(write the code from Table 1.1)*

Name	
Relationship of respondent with the household head if not the head	
Age (years)	
Sex	
Occupation	
Literacy level	

6.1.1.3 Information on the respondent's land holding

Type of land	**Quantity of land (decimal)**	**Present value (BDT)**
Total amount of land		
Homestead land		
Own cultivated land		
Fallow land		
Mortgaged in		
Mortgaged out		
Shared in		
Shared out		
Leased in		
Leased out		
Pond • Own • Leased		

6.1.1.4 Information on farm/family asset of the respondents

Category of family	**No.**	**Present value (BDT)**
Cattle/buffalo		
Goat/sheep		
Poultry		
Rickshaw/van/bicycle/any other vehicle		
Radio/TV		
Tractor, DTW, STW, TW/other farm equipment		
Boat/mechanical boat		
Fridge		
Others (specify) 1. 2. 3.		

6.1.2 Information on Handloom Weaving Business

6.1.2.1 How long are you engaged in weaving business? …… years

6.1.2.2 What are the reasons for your engagement in this business?

1 = Primary source of income	6 = Non-availability of land for farming
2 = Additional source of wage income	7 = Less access to land
3 = Ancestral occupation	8 = Less farm size per household member
4 = For supporting farming activities	9 = Cost of farming is higher than return
5 = More profitable than farming	10 = Others (specify)

6.1.2.3 What is the type of your establishment? 1 = Premise-based, 2 = Factory-based

6.1.2.4 What is the type of your ownership?

1 = Single ownership	3 = Cooperative
2 = Partnership	4 = Corporation

6.1.2.5 How many weaving machines (looms) do you have? …… (number)

6.1.2.6 Number of weaving machines of the respondent

Types of weaving loom/machines	**Types of weaving units**	
	Currently operational	Currently non-operational
Total no. of weaving unit/s		
No. of Pit loom		
No. of Frame loom		
No. of Komar (or Waist) loom		
No. of Semi auto/Japani/Chittaranjan ➢ Motorized ➢ Non-motorized		
Benarasi		
Jamdani		

6.1.2.7 Are you a member of any weaver organization? 1 = yes, 0 = no

6.1.2.8 If yes, what type of membership is it? *(Place tick)*

1 = Tanti samity
2 = Tanti samity group
3 = Both Tanti samity & group
4 = Cooperative industrial union
5 = Cooperative industrial union group
6 = Professional samity
7 = None

6.1.2.9 What kind of benefit have you enjoyed due to your membership?*(place tick)*

1. Financial
2. Administrative
3. Informative
4. Technical
5. Others

6.1.2.10 Information on the fixed assets of handloom weaving business

Type of asset	**Number**	**Present value (BDT)**
Factory building/shade/other structure		
Loom (frame, beam, sley)		
Sana		
Maku		
Baa		
Jackard/ Doby		
Sita		
Chorka		
Natai		
Dram		
Mill		
Other accessories and equipment		

6.1.2.11 Information on production and income from handloom weaving business of the respondent (*Fill the any of the columns)*

Information type	**Daily**	**Weekly**	**Monthly**	**Annually**
No. of weaving units (operational) used				
No. of cloth production/loom/day				
Total no. of cloth production				
Total production (inch)				
Price/piece of cloth				
Total income				

Note: 1 hand = 18 inch

6.1.2.13 Information on labor use and associated wage rate of labors (*fill any of the columns)*

Categories of labor	**Daily**	**Weekly**	**Monthly**	**Annually**
Total no. of labor used				
No. of hired labor (15 years and over)				
No. of family labor (15 years and over)				
No. of child labor (5-14 years)				
No. of male labor used				
No. of female labor used				
Wage rate/hired male labor				
Wage rate/hired male labor				
Wage rate/hired child labor				
Total cost of labor				

6.1.2.14 Cost of handloom weaving during 2015 (fill any of the columns)

Cost items	**Weekly**	**Monthly**	**Annually**
	Amount (BDT)	Amount (BDT)	Amount (BDT)
Cost of raw materials			
Yarn cost			
Dyes and chemical cost			
Transportation cost			
Loading and unloading cost			
Vehicle cost			

Fixed cost			
Capital cost (interest on operating capital)			
Housing/shade repairing cost			
Equipment cost			
Electricity cost			
Other miscellaneous costs (specify) 1. 2.			

6.1.2.15 Average cost and benefit from handloom business (BDT)

Total income (BDT)	
Total cost (BDT)	
Net profit (BDT)	

6.1.2.16 Whom do you sale your product (mode of sale)?

1 = Directly in the market
2 = Mohajan
3 = Wholesaler
4 = Retailer
5 = Tanti samity
6 = Cooperative society
7 = Others

6.1.2.17 How far is the market from your locality? …… (Km)

6.1.2.18 Has your weaving income helped you to expand/increase your business further? 1 = yes, 0 = no

6.1.2.19 Do you face any corruption in case of weaving business? 1 = yes, 0 = no

1 = Corruption in buying the raw materials (e.g., yarn, equipment, etc.)
2 = Corruption in fixing the price of the product
3 = Corruption in transporting the product
4 = Corruption in selling the product
5 = Corruption in getting the formal as well as informal credit
6 = Others (specify)

6.1.2.20 What is the form of corruption?

1 = Wastage of money
2 = Wastage of time
3 = Physical & mental harassment
4 = Others

6.1.2.21 How much was the average cost of corruption in money terms? …….. (BDT)

6.1.2.22 Information on the reasons for non-operational loom *(place tick on the code)*

1 = Shortage of capital
2 = Shortage of good quality material (yarn)
3 = Marketing problem
4 = Shortage of skilled worker
5 = Inadequacy of design
6 = Lack of improved technology
7 = Lack of good quality dyes
8 = Rainy season
9 = Importance of agricultural production for subsistence need
10 = Lack of profitability
11 = Others (specify)

6.1.3 Information on Microcredit Transactions

6.1.3.1 Do you have access to BHB's microcredit services? 1 = yes, 0 = no

6.1.3.2 From which bank do you receive the BHB's credit?

1 = Bangladesh Krishi Bank (BKB)

2 = Rajshahi Krishi Unnayan Bank (RAKUB)

6.1.3.3 How many times did you receive the loan from BHB? …… (times)

6.1.3.4 Information on the amount of loan received and paid by the weavers from BHB

Basis of data collection	**Loan received from BHB (**BDT**)**				**Total**
	1st time	2nd time	3rd time	> 3 times	
Amount of loan received					
Amount of loan repaid					
Interest rate (%)					

6.1.3.5 Do you have access to credit services other than BHB's credit? 1 = yes, 0 = no

6.1.3.6 What are the other sources of your credit?

1 = Bank
2 = Tanty samity
3 = Cooperative society
4 = Relatives/friends
5 = Mahajan
6 = Paiker
7 = Local money lender
8 = NGO
9 = Village samity
10 = Others

6.1.3.7 What type of credit service is it, if not the BHB's credit?

1 = Agricultural credit
2 = Non-agricultural/ off-farm business credit
3 = Credit for household consumption
4 = Credit for housing
5 = Credit for medical expenses
6 = Credit for other activities(specify)

6.1.3.8 If the source of loan is bank/NGO, please mention the name.

1 = BRAC
2 = ASA
3 = GB
4 = Others (specify)

6.1.3.9 How many times did you receive the loan from other sources during 2015? ..... (no.)

6.1.3.10 Information on the source-wise amount of loan received and repaid from different sources than BHB during 2015

Sources of loan	**Amount of loan received (BDT)**	**Amount of loan repaid (BDT)**	**Interest rate**
Bank(s)			
NGO(s)			
Tanty samity			
Cooperative society			
Mohajan			
Paiker			
Relatives/friends			
Village samity			
Others			

6.1.3.11 How frequently did you pay the loan money back?

1 = weekly
2 = bi-weekly
3 = monthly
4 = annually
5 = others (specify)

6.1.3.12 Did the microfinance institution require collateral for your loan? 1 = yes, 0 = no

6.1.3.13 Has MC helped you to increase your weaving income? 1 = yes, 0 = no

6.1.3.14 Did you utilize this loan money for other purposes? 1 = yes, 0 = no

6.1.3.15 If yes, for which purpose it was?

1 = Agricultural investment
2 = Off-farm investment except weaving
3 = Household consumption
4 = Buying medicine
5 = Children's education
6 = Other activities

6.1.3.16 Were you able to repay the loan in time?

6.1.3.17 If no, how much interest (in %) did you pay for the rest of the loan money?

6.1.3.18 Did anyone help you to receive the loan from the credit institution?

6.1.3.19 Did you pay bribery to those persons for his/her help in getting the loan?

6.1.3.20 If yes, how much (BDT) did you pay as bribery? ..... (BDT)

6.1.3.21 What was the opportunity cost loan collection?

1 = Time wastage
2 = Increased transportation cost
3 = Ignorance about the interest rate
4 = Others

6.1.3.22 Have you received any services from BHB other than credit? 1 = yes, 0 = no

6.1.3.23 If yes, please mention the type of services you received.

1 = Training
2 = Field demonstration
3 = Mela (exhibition)
4 = Advisory services
5 = Academic sessions
6 = Money allowance/subsidies on loan repayment
7 = others (specify)

6.1.3.24 How effective was those services?

1 = effective
2 = moderately effective
3 = Not effective
4 = Don't know

6.1.3.25 Have you received any services from NGOs? 1 = yes, 0 = no

6.1.3.26 If yes, please mention the type of services you received?

..... (Write the code from 6.1.3.23)

6.1.4 Information on the Farming Activities (if any)

6.1.4.1 Are you engaged in farming activities besides weaving business? 1 = yes, 0 = no

6.1.4.2 If yes, please mention the amount of cultivated land. …….. (acre)

6.1.4.2 How long are you engaged in farming activities? ..... (years)

6.1.4.3. What are the reasons for undertaking farming as an occupation?*(Tick only one option per column)*

Reasons	**Most important**	**Second most important**	**Third most important**
For only subsistence need			
As primary source of income			
As additional source of income			
For reducing family expenses on food			
To continue my parental occupation			
To utilize the land available to me			
Others (specify) 1. 2.			

6.1.4.4 Land use pattern under different farming activities

Types of farming activities	**Own land (decimal)**	**Rented in (decimal)**	**Rented out (decimal)**
i) Crop production			
Rice			
Wheat			
Maize			
Jute			
Potato			
Leafy vegetable			
Fruit trees			
Others			
ii) Fisheries production			
iii) Livestock production			

iv) Others (specify) • •			

6.1.4.5 What is the distance of the market from the village? ..... (km.)

6.1.4.6 Information on the annual production, sales and income from different farming activities during 2015

Crops type	**Unit of calculation**	**Total production**	**Marketed quantity**	**Unit price (BDT/unit)**	**Income from land rented out**	**Total income (BDT)**
Crop production						
Rice						
Wheat	Kg					
Maize	Kg					
Jute	Kg					
Potato	Kg					
Leafy vegetable	Kg					
Fruits	Kg					
Others	Kg					
Fisheries production	kg					
Livestock production						
Cattle/Buffalo	Litre of milk					
Goat/sheep	Total value					
Poultry	Dozen of egg					
Others (Specify)						
1.						
2.						

6.1.4.7 Information on the annual cost of production (BDT) of different farming enterprises during 2015

Crop type						**Cost category**				
	Cost of land rented in	**Seed/seedling**	**Labour**	**Fertilizer**	**Pesticide**	**Irrigation**	**Equipment**	**Miscellaneous**	**Marketing**	**Total cost**
Crop production										
Wheat										
Maize										
Jute										
Potato										
Leafy vegetable										
Fruit trees										
Fisheries production										
Livestock production		-		-	-	-	-	-	-	
Others										
1.										
2.										

6.1.4.8 Information on the respondents' annual income from other off and non-farm sources, except weaving

Income sources	**Total income (BDT)**
Agricultural wage labor	
Non-agricultural wage labor	
Service	
Business	
Remittance	
Transportation worker	
Others (specify) 1. 2.	

6.1.4.9 Is your farm income interlinked with the weaving income? 1 = yes, 0 = no

6.1.4.10 If yes, how is it interlinked?

1 = Through income/investment linkage
2 = Through consumption linkage
3 = Through labor allocation
4 = Others (specify)

6.1.4.11 If the linkage is through labor allocation, how do you allocate them?

1 = depending on leisure time
2 = depending on the working age
3 = depending on skill/ability
4 = Depending on each person's interest
5 = depending on household head's decision
6 = others (specify)
i.
ii.

6.1.4.12 Do you have access to enough food? 1 = yes, 0 = no

6.1.4.13 If yes, has your food security status increased due to your participation in the microcredit program? 1 = yes, 0 = no

6.1.4.14 Do you have access to extension services regarding your farming activities? 1 = yes, 0 = no

6.1.4.15 If yes, from where did you get these services?

1 = Government
2 = Private seed/fertilizer company
3 = Non-government organization
5 = Cooperative society
6 = Others
7 = others
8 = No answer/don't know

6.1.5 Pattern of Consumption, Expenditure, Investment, and Savings

6.1.5.1 Average weekly food consumption and the cost incurred by the respondents

Food items	Unit	Quantity consumed	Own consumption	Market purchase	Price/unit	Total cost of consumption (USD)
Rice	kg					
Wheat	kg					
Meat	kg					
Fish	kg					
Egg	No.					
Milk	Litre					
Leafy vegetables	kg					
Edible oil	Litre					
Potato	kg					
Lentil	kg					
Spices	kg					
Fruits	kg					
Others	-					

6.1.5.2 Information on annual household expenditure of the respondents other than food

Cost item	Basis of cost calculation	Amount of money spent (USD)
Health	Monthly/Annual	
Clothing	Annual	
Education	Annual	
Housing	Monthly/annual	
Fuel and electricity	Monthly	
Transportation	Monthly/annual	
Ceremony & festival	Annual	
Purchase of fixed asset	Annual	
Purchase of non-fixed asset	Annual	

Gift purposes	Annual	
Tax	Annual	
Miscellaneous	Annual	

6.1.5.3 Information on annual household investment and savings of the weavers

Investment type	**Amount of money invested (USD)**
Handloom weaving business	
Crop and vegetable production	
Livestock production	
Fisheries production	
Other businesses	

6.1.5.4 How much are you able to save after meeting your food and non-food expenditures? ..... (USD)

6.1.6 Information on Social Infrastructural Facilities

6.1.6.1 Information on the households' access to other social infrastructures

Type of social infrastructure	Available in this village		If yes, do you or your family has access to these facilities	
	1 = yes	0 = no	1 = yes	0 = no
Education				
Housing (state/council/defence)				
Health service				
Electricity				
Civic & Utilities (water, sports facilities, etc.)				
Public transport				
Agricultural input market				
Agricultural output market				
Others 1) 2) 3)				

Thank you for your cooperation

6.2 Guideline for the Qualitative Data Collection

6.2.1 What is PNM?

The PNM is a participatory mapping method that helps to define the issue, the key actors, the organizational set-ups, their influential behavior and conflicting. The method has the potential to understand the institutional perspectives in a multi-stakeholder analysis goals (Schiffer and Peakes, 2009; Schiffer and Hauck, 2010). For example, the performance of BHB's credit scheme or any other government and non-government organizations can be assessed efficiently using this method. The use of the method also helps to identify the actors who overpower the systems or rules of the organization, thus violates the organizational equity in performing associated roles by others. The method is also useful in identifying the challenges faced by the organization so that the preventive measures can be taken beforehand.

6.2.1.1 What issues to be addressed by PNM?

a. How does the Bangladesh Handloom Board (BHB) implement its microcredit programs;
b. What kinds of actors are involved in this process and how they are linked to each other?
c. Who is more influential in performing their duties and responsibilities at different phases of credit implementation?
d. To what extent these influential actors affects the successful credit delivery to the borrowers
e. What kinds of challenges are confronted while implementing the credit program?

6.2.1.2 Resources required for conducting PNM:

- Large sheet of paper
- Pens of different colors
- Notepads of different colors; and
- Carom pieces/coins/ pieces of any stones

6.2.1.3 How to conduct the PNM?

To address the research issues mentioned above, the following steps would be followed:

- *Please ask the respondents how the BHB's credit program is implemented (a)? Who is involved in the process (b)?*

    - As soon as the respondent starts replying, place the large sheet of paper in front of whom you are interviewing.

    - Ask him/her listing the names of the stakeholders involved in loan implementation process one by one. Here, the stakeholder could be an individual (either men or women), the organization itself, its departments, government, the private sector, NGOs, banks, borrowers, etc.

    - Each time the respondent mentions the name of any stakeholder, write their name on the notepad and stick it on the large sheet. If possible, use different colors for the different stakeholders. For example, use a green pad to indicate the organization (e.g., BHB)), red pad for banks, pink pad for departments (use) and so on.

    - In the next step, ask them to draw the linkages between the stakeholders by using the arrow sign.

    - To differentiate between the types of linkage such as fund flow, information flow, command flow, etc., use different colors of pens.

    - Please number the linkages as the sequences mentioned by the respondents and make a note of who is connected to whom either at the bottom or at the side of the large sheet.

    - At the end of listing the names and drawing the linkage, a whole process would be visible and understandable from the points noted at the bottom of the paper. Thus, the information on (a) and (b) would be collected.

- *Please ask the respondents how influential are the actors in the overall process (c) & (d)?*

    - In this step, ask the respondent rating the influence level of different actors within a scale of 0-10.

    - Use the carom pieces to assign the perceived influence beside those actors who are perceived to be influential.

    - Ask them why they are influential? What roles do they play in the process of credit delivery from supplier point to the demand point?

    - Note down or record those responses with the permission of the respondent. Take photos of each task if necessary.

- *Please ask the respondents what kind of governance challenges are confronted by BHB and why (e)?*
    - Ask the respondent to explain the governance challenges that the institution faces in details.
    - Make sure to ask the reasons for facing such challenges?
    - Ask them to show the potential entry points that cause challenges to occur in the system? More clearly, who among the stakeholders do not perform their role properly that contributes to poor service providing.
    - Mark those stakeholders by a star sign beside their name who are accused of being responsible for creating such challenges.
    - Ask them their opinion regarding the actions to be taken in addressing those challenges.

6.2.1.4 Clarification of the collected responses

- The clarification of the responses is a most crucial part of the reliability and validity of the research depends on the correctness of the information you have collected. Therefore, cross-check the information on the spot.
- Discuss with the respondents about your confusion, if any. For example, if any members draw so many linkages between two actors but say they are not influential, ask them why that is so?

- If someone is afraid of mentioning the names of the stakeholder who causes challenges in the system, do not pressurize them. However, try to get the answer technically.
- Once you are done with cross-checking, ask them to generalize the process without focusing on the map or following the steps.
- At the end of the discussion, cordially thank them and appreciate their participation.

6.2.1.5 How many PNM would be constructed?[62]

A total of 5 PNM is expected to be conducted from both the central and regional levels. However, it will depend on the availability and convenience of the respondents as the PNM is a time-consuming process.

6.2.2 What is KII?

KII means interviewing the key employees of the project or an institution who are able to provide detailed insight on your inquiry. It could be the person you requested to draw the PNM or somebody else like Manager or Director, Chairman or any others employees of an institution.

The KIIs would be conducted from both demand-side (beneficiaries) and supply-side (BHB). In fact, the interviews with the respondents who will be participating in PNM exercises would already be regarded as KI. Additionally, some other respondents such as the field supervisors could also be interviewed to understand the challenges faced during field demonstration. While the board manager can be interviewed for understanding the challenges they face from the central level such as financing problem, corruption problem, political problems, etc.

However, the KIIs would mainly be conducted to understand the problems faced by the borrowers. For example, whether they face any entry restriction, whether they paid bribery to get the entry to the program etc. In fact, this information is a proxy for assessing the governance problem of the program. More plainly, the demand-side information will highlight the problem in details that the supply-side respondents may hide either due to the fear of organizational dis-reputation or because they are far away from understanding the real

[62] For the sake of anonymity, which basic centers would be the study coverage is not revealed in this questionnaire? As there is a possibility that someone from BHB will read the thesis and will accuse those respondents for revealing the actual facts.

problems at the field. Therefore, to come up with a clear demand-based policy, it is essential to know the challenges faced by both sides.

The interviews are not limited to a specific number. As much as respondents from both sides would be easily assessable would be interviewed. Admittedly, it also depends on the research timetable and financial solvency.

6.2.2.1 How to conduct KIIs?

Target questions for to be asked while interviewing KIs from demand-side:

- What kind of problem do they face under the BHB's credit program?

Specifically, the following questions could be addressed:

- Do they get adequate fund according to their requirement?
- If not, what is the reason for that they think?
- Have they received any other non-financial services from BHB other than only financial service? If yes, how effective were those services?
- Alternatively, are they happy with the services of BHB? If not, please ask them to mention some of the reasons for being unhappy with the program performance.
- Whether the terms and conditions of the loan are flexible enough for them to carry on? If not, what kind of service they require from the BHB?
- Whether they faced any corruption in the system?
- How do they compare the BHB's credit services with other credit programs, if they receive credit from multiple sources?
- Whether they are better concerned about the services that they are supposed to receive from BHB?
- What is their general opinion regarding the BHB's credit program?

Note: Ask the following questions, if needed. Make clear notes of each interview or record it. Cross-check the interviews conducted at the spot immediately after the interview. Write a summary of each interview in word file at the end of the day so that the transcription is partly done during the data collection period.

6.2.3 References

Schiffer, E. and Jessica, P. (2009). An Innovative Approach to Building Stronger Coalitions: The Net-Map Toolbox. *Development in Practice, 19 (1),* 103–5. doi:10.1080/09614520802576500.

Schiffer, E., and Hauck, J. (2010). Net-Map: Collecting Social Network Data and Facilitating Network Learning through Participatory Influence Network Mapping. *Field Methods,* 22 *(3),* 231–49. doi:10.1177/1525822X10374798.

Good luck

7 Curriculum Vitae (CV) of MST TANIA PARVIN

7.1 Personal details

Name	:	**PARVIN, MST TANIA**
Date of birth	:	28 November 1989
Place of birth	:	Sirajgonj
Nationality	:	Bangladeshi (by birth)
Religion	:	Islam
Sex	:	Female
Marital status	:	Married
Mobile No.	:	+49 15212883361
Email	:	taniaparvin2011@yahoo.com
Present address	:	Institute of Agricultural Sciences in the Tropics (490c), University of Hohenheim, Wollgrasweg 43, 70599 Stuttgart, Germany
Home address	:	Village: Nogordala, Post office: Nogordala, Upazila: Shahjadpur, District: Sirajganj

7.2 Academic qualifications

Years Attended	Degree obtained	GPA obtained
2014–2018	PhD Candidate, Institute of Agricultural Sciences in the Tropics (490c), University of Hohenheim, Stuttgart, Germany	-
2012-2013	Master of Science in Agricultural Economics (Production Economics), Department of Agricultural Economics, Bangladesh Agricultural University, Mymensingh, Bangladesh	Grade: A CGPA: 3.898 (on a scale of 4.00)
2008-2011	Bachelor of Science in Agricultural Economics (Honours), Faculty of Agricultural Economics and Rural Sociology, Bangladesh Agricultural	Grade: A- CGPA: 3.687 (on a scale of 4.00)

	University, Mymensingh, Bangladesh	
2005-2007	Higher Secondary Certificate (HSC), Ullapara Science College, Ullapara, Sirajganj, Bangladesh	Grade: A^+ CGPA: 5.00 (On 5.00 scale basis)
2000-2005	Secondary School Certificate (SSC), Falia High School, Ullapara, Sirajganj, Bangladesh	Grade A CGPA: 4.63 (On 5.00 scale basis)

7.3 Work experience

Employer: Department of Agribusiness, Faculty of Agricultural Economics and Rural Development, Bangabandhu Sheikh Mujibur Rahman Agricultural University, Gajipur-1706, Bangladesh.

Position: Lecturer (currently in study leave)

Period: 2014 –till date

Duties:

- Teaching of agribusiness courses at the undergraduate level: Agribusiness Management, Agricultural Marketing, Price Analysis
- Conducting research on agricultural economics and agribusiness topics, more particularly, market analysis, value chain analysis, entrepreneurship development and the like
- Moderating examinations and making the exam papers
- Coordinating seminars and presentations
- Assisting in course planning and development
- Attending departmental meetings
- Performing additional administrative duties in the Board of Studies (BoS) meeting
- To monitor the performance of the students and providing suggestion for improvement

Employer: Livelihood Improvement of Farming Community in Haor Areas through System Approach (LIFCHASA) project

Position: Research fellow

Period: 2011-2013

Duties:

- Conducting household survey to collect the data on the socioeconomic component of the project participants
- Data entry and cleaning
- Data analysis
- Report writing
- Thesis submission at the Department of Agricultural Economics

7.4 Awards received

Award details	**Year of obtainment**
i) German Academic Exchange Service (DAAD) Scholarship Award (grant number 91538050) under the PhD program "Agricultural Economics, Bioeconomy, and Rural Development."	2014-2018
ii) National Science and Technology (NST) fellowship award under the Ministry of Science, Information and Communication Technology, Government of the People's Republic of Bangladesh	2012-2013

7.5 Seminars and Conferences Attended

- Training Seminar on "Team Management and Accountability" held during 16-17 November 2017 at the Institute of Agricultural Sciences in the Tropics (490c), University of Hohenheim, Germany.
- "Tropentag Conference," 2017: International conference on "Future Agriculture: Social-ecological Transitions and Bio-cultural Shifts," September 20-22, 2017, University of Bonn, Germany. Poster entitled "What Are the Governance Challenges of Microcredit Programs in Bangladesh? The Case of a Specialised Government Credit Program" was presented at that conference.
- "International Development Strategies" Seminar, 2014: Paper entitled "Achieving Sustainable Livelihood by Managing Human Capital" was presented on 30.12.2014 at the Department of Project and Regional Planning, University of Giessen, Germany during winter term 2014-2015. The performance of the written paper, oral presentation and defense were evaluated by the grade: 2.0.

- "Tropentag Conference," 2014: International conference on "Building the Gap between Increasing Knowledge and Decreasing Resources," September 17-19, 2014, Czech University of Life Sciences Prague, Prague, Czech Republic.

7.6 Modules and courses attended during the PhD study

Module Title	**Duration/semester**
i) Deutschlernportal DUO - online German language course	07.04.14-30.06.14
ii) Deutschsprachkurs- German Language Course of the PhD Program for Agricultural Economics and Related Sciences at the Justus-Liebig University of Giessen.	03.06.14-15.09.14
iii) Module 6700: Economic Modeling with GAMS at the Justus-Liebig University of Giessen.	10.06.14-14.06.14
iv) Module 7000: Publishing and Writing Strategies for Agricultural Economists at the Justus-Liebig University of Giessen.	09.03.15-13.03.15
v) Module 09 MK-68: Empirical research Method s at the Justus-Liebig University of Giessen.	Winter Semester, 2014/2015
vi) Module: 6700: Economic Modeling with the GAMS software at the Justus-Liebig University of Giessen.	08.06.15-12.06.15
vii) Module 200: Efficiency and Productivity Analysis 2-Stochastic Approaches at the Georg-August University of Goettingen.	04.04.16-08.04.16
viii) Module 4903-470: Qualitative Research Methods in Rural Development Studies at the University of Hohenheim.	Summer Semester, 2016
ix) Module: 4903-460: Methods in Interdisciplinary Collaboration (4903-460) at the University of Hohenheim.	Winter Semester 2016/17

7.7 Membership Status

- Member of American Agricultural Economist Association (AAEA)
- Krishibid Institution Bangladesh (KIB)
- Bangladesh Agricultural Economist Association (BAEA)
- Bangladesh Agricultural University Alumni Association (BAUAA)

7.8 Computer Skill

- Excellent skill in data entry, data cleaning, data analysis and report writing through the use of basic computer software packages such as MS Word, MS Excel, PowerPoint, SPSS, STATA, etc.
- Qualitative data analysis skill using Nvivo software, Visualizer etc.
- Good in making presentations.

7.9 Language Proficiency

- English fluency in both spoken and written (Completed four years bachelor in English Medium, Completed an Advanced Course on Communicative English and got 6.5 scores in IELTS).
- Can read, write and speak in Bengali smartly.
- Can read and write Arabic.
- Can understand Hindi/Urdu.
- Basic understanding of German.

7.10 Training Description

- Completed three months training course on Computer Application during 09.07.2005-09.09.2005 at Classic Computer Training Institute, Ullapara, Sirajganj.
- Completed "an Advanced Course on Communicative English" during September to October 2012 arranged by the Department of Language, Bangladesh Agricultural University, Mymensingh, Bangladesh.

7.11 Personal Interests

- Keenly interested in reading novels, cooking, watching movies, walking and exploring new places

7.12 List of publications

1) Parvin, M. T. & Haque, S. (2017). An Analysis of Socioeconomic Indicators of Rural Non-Agricultural Households in Bangladesh: A Case of Handloom Weaving. *Journal of Economics and Sustainable Development, 8(12),* 1-12.
2) Rahman, F., Shammi, S. A., Parvin, M. T., Akter, N, Khan, M.S. & Haque, S. (2016). Contribution of Rural Women to Rice Production Activities in Two Different Areas of Bangladesh. *Progressive Agriculture, 27 (2),* 180-188. DOI: http://dx.doi.org/10.3329/pa.v27i2.29329.
3) Parvin, M. T. & Akteruzzaman, M., (2013). Factors Affecting Farm and Non-farm Income of Haor Inhabitants of Bangladesh. *Progressive Agriculture*, 23 *(1 & 2)*, 143-150.
4) Hossain, M. R., Akteruzzaman, M., Parvin, M. T., Bhiya, M. S. U. & Hossain, M. S. A. (2013). Marketing Channel of Fish and Value Addition by Different Actors in Haor Area of Netrokona District. *Bangladesh Journal of Crop Science*, *24(1),* 131-140.
5) Akteruzzaman M, Parvin MT & Islam S. (2012). Improvement of Integrated Farming Systems for Maximizing Income and Food Security in Noakhali Region. *Journal of Bangladesh Society for Agricultural Science and Technology., 9(3&4),* 139-146.

Stuttgart, 08.01.2018
Place, Date

Mst. Tania Parvin
Applicant's Signature