

Indirect effect of water supply and sanitation on women entrepreneurs mediated by digital payment

A Case Study from Bangladesh

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JEL Classification

D14

G20

I30

M13

Keywords

Water supply and sanitation (WSS)

Women entrepreneurship

Digital payment

Financial inclusion

Microfinance

Introduction and Objectives

In Bangladesh, Water.org has piloted a water and sanitation lending¹ project through digital financial service providers, implemented by a microfinance institution² during the period January to September 2018. This enabled borrowers in three branches in and

¹ Throughout the proposed paper, water and sanitation lending is used to refer to what Water.org calls 'WaterCredit'. Water.org partners with carefully selected institutions that provide affordable financing for water and sanitation to families in need"

² Names and identity of the institution has been omitted since Water.org believes the competitive advantage (if any) embedded to the pilot may be considered as a point of selection bias among the sector partners.

around Dhaka City to make loan repayments³ digitally through agent points. Clients repaid loans using mobile banking technology of an MFS provider⁴ in Bangladesh, without having to visit microfinance branches. This was expected to improve operating efficiency ratios, and microfinance institutions field officers were able to better utilize their time in the provision of other services to clients. The pilot was considered as a learning case for better understanding, i.e., the competitive advantages of introducing digital platform in water and sanitation lending.

The study explores and identifies advantages of adoption of digital payments by households, comparing the underlying characteristics of borrowers who adopt digital payments with borrowers who don't. Thus, the main objective of the study is to explore the perceived benefits of DFS-led water and sanitation lending at the household level. Moreover, the paper aims to (a) identify the amount of time and money saved from the use of digital payment; (b) explore causal links to improved water supply and sanitation services, and development of women entrepreneurs at the presence of digital payment facility.

Literature review

Digital financial services is considered as most important conduit to individuals, entrepreneurs, multinational companies and policy makers (Lund & Manyika, 2016). In the realm of information and communication technologies, digitization of payments becomes the power tool for emerging countries. When ICT allows women and girls to challenge gender-base power relations (Cummings & O'Neil, 2015), access to digital payments reduces the earning gaps between men and women (Sinha, 2018). There are handful literature on entrepreneurship development covering the factors affecting entrepreneurial decisions. However, we find a few articles that discuss the relationships among access to WSS facility, access to digital payments and women entrepreneurial development. In many developing countries, including Bangladesh, there are millions of women who spend hours for collecting water for their households. In accordance with UNICEF (2016), women and girls spend 200 million hours in collecting water, which is termed as colossal waste of time and opportunities. In Bangladesh, 44% people of the country do not have access to safely managed drinking water, 53% people are lack of access to safely managed sanitation facility ("World Development Indicators," 2018).

³ Due to regulatory bindings that limit amount of transaction per day/month, the MFI is disbursing loans in cash; for details: <https://www.bb.org.bd/fnansys/paymentsys/mobilefin.php>.

⁴ Name of MFS provider is left out

Pories (2016) argues that household at BoP have significant exposure to financial gains from having WSS infrastructure at their homes. Access to WSS facility allows households in India to reduce water fetching times by 6-14 hours a week (Pories, 2016). The presumption of positive correlation between reallocation of time saving and productivity likely allows us to investigate whether likelihood of being entrepreneur depends on adoption of WSS facility. Nonetheless, adoption of digital payment has significant impact on time saving and cost saving (Klapper & Singer, 2014).which likely induce women to invest in productive activities. This tends to guide us to assume that adoption of WaterCredit and digital payment have impact on the likelihood of being entrepreneur. There are handful literature (Huarng, Mas-Tur, & Yu, 2012; Ming-Yen & Siong-Choy, 2007; Wilson, Kickul, & Marlino, 2007; Zhang, Duysters, & Cloudt, 2014) that investigated women entrepreneurship development. In these literatures, efficacy and factors affecting women entrepreneurship development and their survivals are studied in the context of educated women. However, only a few literatures cover middle- or lower-income women who have not enrolled in universities. The study of identifying likelihood of being women entrepreneurs at the presence of adoption of digital payment and WSS facility in Bangladesh context is most likely absent. Thus, this study explores the underlying research gaps and provide policy inputs for decision makers of private, public and political organizations in taking welfare decisions for the wellbeing of the societies. It is likely that access to WSS facilities allows women to invest their time in productive activities and income generation. In this current research, we tried to measure the probability of being entrepreneurs as a result of time saving from having WSS facility.

Methodology and Data

In this paper, we applied a mixed method approach to analyze underlying relations among access to water supply and sanitation facility, adoption of digital financial services and women entrepreneurship development. The study is based on four types of primary data: client-level cross-sectional data collected through a sample survey from 100 households of cashless branches and 100 households of cash-based branches of the microfinance institution; micronarratives developed from qualitative interviews, key informant interviews (KII); and secondary data analysis.

It is hypothesized that digital financial services can help a microfinance institution to reduce operating costs and clients are benefited by saving time and cost. However, underlying dimensions of cost savings and time savings are often relatively unexplored. In order to explore such outcomes, a mixed method approach is deployed, i.e., combining case studies with cross-sectional sample survey. The cross-sectional sample survey would

presumably enable comparative analysis of cashless branches and cash-based branches. Univariate statistics will be used to describe the underlying characteristics of level of adoption of digital payments; two way ANOVA will capture the statistical differences between cashless branch and cash-based branches. As one of the goals of this study is to uncover the boundary conditions for (any) association between water supply and sanitation services (WSS) and women entrepreneurship development, **moderation analysis will allow to explore the magnitude of effect of WSS facility on women entrepreneurship development.** Thus, a mediator analysis (Hayes, 2009; Sobel, 1982) is conducted to identify the existence of indirect effect of water and sanitation facility on women entrepreneurship at the presence of digital payment options, which constitutes the mediator.

After completing cross-sectional sample survey of 191 conducted for collecting household data from women borrowers who adopted WaterCredit loans, women entrepreneurs were identified. The identification of women entrepreneurs allowed us to adopt the triangulation of our research approach. Even if micronarratives⁵ were developed prior to the construction of survey instrument, we interviewed nearly 10 women entrepreneurs again to explore the stories behind their business initiatives and how WSS facilities and the provision of digital payments helped them to sustain and grow their business.

Before the provision of repaying installment digitally, borrowers used to attend the MFI's monthly group meeting in a centre⁶ of microfinance institution. The provision of making repayment through MFS agent allows borrowers to do transactions by the help of an agent located nearby their house rather than going to group meeting. It implies that digital repayments lead a reduction of time and cost from borrowers end considering to the fact that the average distance of agents' location is likely closer than the distance of group centre. The cost of using conventional cash transactions is measured by cost estimated for rickshaw ride to and from the borrowers' residence and location of group centre where they meet every time. On the other hand, time spent associated with conventional practice constitutes number of minutes required to reach and come back to house from the group centre, and waiting time in completing transactions.

If we consider a nearest agent providing the same service of installment payment, the difference of spending time between group centre and agent location is the time saving by a MFS service adopted borrower. The cost saving measured in taka and time saving measured in minutes by two group of borrowers i.e., half of the surveyed borrowers paid

⁵ Underlying characteristics of WaterCredit borrowers adopting digital payments were identified from micronarratives.

⁶ MFI's centre is a location, generally a house of a borrower who is considered as a leader of a particular borrower's group in their neighborhood.

digitally and half of them used conventional cash transactions, are compared using univariate statistics and two-way ANOVA.

Borrowers responses of attitudinal statements on digital payment service and its relative benefits and deterrents over conventional cash transactions were measured in 5—point likert items⁷ (please see table 1 in appendix).

Existing literature (Islam, 2016; Parvez, Islam, & Woodard, 2015) available on MFS in Bangladesh less likely used parametric analysis. The question is whether likert scale can be used in parametric statistical analysis. A typical 5-point likert points indicating the degree of agreement with an attitudinal statement are, in fact, ordered categories. In an empirical research, Lubke and Muthén (2004) showed that a true parameter is possible to estimate in factor analysis with dataset in likert points.

It is likely unwise to use borrowers' perceived values captured in 11 likert items for further statistical analysis without conducting factor analysis which allows combine and transform likert items into likert scales meaning that associated response variables are combined to form factor variables. We applied principal component analysis (PCA) using Stata/SE (StataCorp, 2013) to identify factor variables.

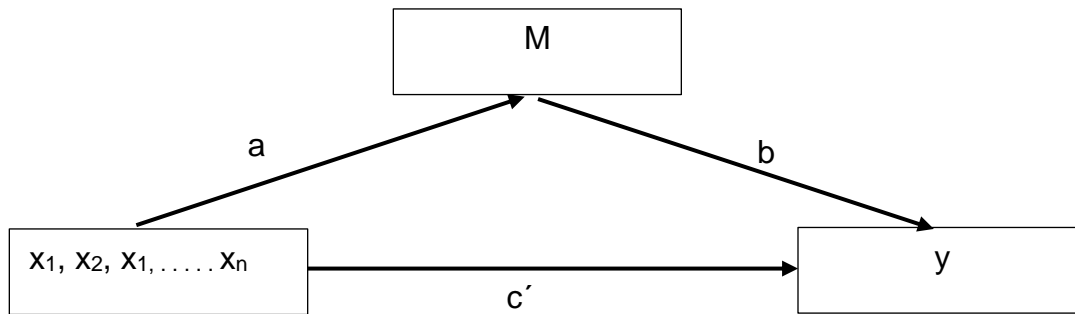
Combined variables of borrowers' response constructed after conducting PCA are used as indicator variables alongside the adoption of WaterCredit, the adoption of MFS facility, education and time saving. The indicator variables are regressed in ordered logistic regression model. As one of the objectives of this paper is to identify the likelihood of being entrepreneurs as an effect of indicator variables at the presence of WSS facility, we measure the indirect effect of indicator variables on women entrepreneurs. The steps involves in parametric analysis can be summarized as follows:

1. Conducting PCA on Likert items
2. Grouping associated Likert items into factor variables and naming the variables
3. Running ordered logistic regression taking the categorical variable of women entrepreneurs as dependent variable and multicategories, i.e., adoption of MFS facility, education, WaterCredit adoption, time saving from digital choice and other factor variables constructed from PCA
4. Running ordered logistic regression taking the categorical variable of adoption of MFS facility as dependent variable and multicategories, i.e., education, WaterCredit adoption, time saving from digital choice and other factor variables constructed from PCA

⁷ Likert scale is measure of grouped variable constructed from PCA analysis of likert items

- Calculate indirect effect of indicator variables by multiplying the coefficient of adoption of MFS facility in the first regression model with coefficients of indicator variables in second regression model.

The approach of mediation analysis is hypothesized that among variables a causal chain exists in which one variable affects second variable and second variable affects a third variable meaning that a first variable has indirect effect on a third variable. This approach can be depicted as follows:



There are two approaches of estimating indirect effect, one proposed by Judd and Kenny (1981) and another by Sobel (1982). We applied the latter approach. Considering the approach by (Sobel, 1982) and multi-categorical indicators, the mathematical function of the logistic regression and indirect effect estimation are as follows:

$$\Pr(women_ent = 1|x_1, x_2 \dots x_k) = \frac{1}{1 + \left(\frac{1}{e^{\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k}}\right)} \quad \text{Eq (1)}$$

$$\Pr(adopt = 1|x_2, x_3 \dots x_k) = \frac{1}{1 + \left(\frac{1}{e^{\gamma_0 + \gamma_2 x_2 + \gamma_3 x_3 + \dots + \gamma_k x_k}}\right)} \quad \text{Eq (2)}$$

women_ent is the dependent variable that take 1 if a borrower is entrepreneur, 0 otherwise

x_1 stands for adoption of MFS facility, 1 if adopted, 0 otherwise

$x_2, x_3 \dots x_k$ are the multi-categorical variables of adoption of WaterCredit, education dummy, time saving from digital choice and other factor variables constructed from PCA.

The variable *adopt* which is the first indicator variable in Eq(1), becomes dependent variable in Eq(2) meaning that adoption of MFS facility is assigned as mediator in the two structural equations Eq(1) and Eq(2). According to Sobel (1982) approach, the indirect effect of x_2 , suppose it is WaterCredit adoption, can be estimated by multiplying the coefficient of x_1 in Eq(1) and coefficient of x_2 in Eq(2).

In a mathematical form:

$$\gamma_{i(indirect)} = \gamma_i(\beta_i) \quad \text{Eq (3)}$$

Analysis and Results

The underlying characteristics of MFS facility adopted WaterCredit borrowers are presented in table 1 and table 2 (a) in the appendix. The sample survey conducted in the outskirts of Dhaka city likely captures the dynamics of human settlements of the country. From the table 2(a) in Appendix, we observe that nearly 60% WaterCredit borrowers do not have their own house which implies that lions share of these group of women are migrated to the city from their native village. Among surveyed borrows 15.2% are entrepreneurs, 86.2% took WaterCredit loans from the MFI for water options – digging and constructing tube-wells, submersible pumps or getting water filter that ensure quality of drinking water.

Among the women borrowers, 40% have mobile wallet, which is likely similar to the statistics of InterMedia (2019). Of the women borrowers, 62% women go to MFS agent themselves to make digital payments every time. Nearly 48% of the women surveyed feel worry after making digital transactions, which implies the significant level of lack of trust. This tends to show their preference to conventional transactions that allows them to have some proof of payments. This statement is supported by the findings that 83% women think they need some document as a proof of their digital payments (Item 9 in Table 2, Appendix 1). Even if MFs provider sends text message confirming transactions, 60% women think that a mere text message is not enough for them. One of the reasons behind this problem is the difficulty of understanding the message which were sent in English.

The summary table of perceptual responses of women borrowers [table 2(b) in Appendix 1] shows that the MFS service is less likely welcome by the respondents. 50% of the respondents are at least disagreed (38% disagree, and 14% strongly disagree) with the statement that making installment digitally is safe, whereas only 32 borrowers likely agreed to the statement. Privacy concerns of micro-credit borrowers leads to be very high – 46% do not think transaction through MFS agent can allow them to maintain privacy. Likert items V5_3 to V5_11 captures the relative preference of digital payments and conventional mode of transaction i.e., making repayment in the group center. The comparative statement with regards to the comfortability of doing digital transactions indicates that 31% respondents feel more discomfort to go to MFS agent than going to group center. Nonetheless, more than 67% are at least disagreed (58% disagree, and 9% strongly disagree) to the perceptual statement that making repayment through MFS agent is more convenient than attending group centre.

Average age of the borrowers surveyed is 37 years, and their household size are 4.57, nearly one child of each household goes to school. Monthly household income and respondents' monthly income positively skewed meaning that mean values are higher than median value, where the survey revealed average monthly income of 39,403 taka, the mean water and sanitation loan size is 25,508 taka. The average distance of group center is significantly higher than the distance of nearby MFIs agent which supported by the fact that average time to reach group center and nearby MFIs agent is 9.68 minutes and 6.7 minutes respectively. In addition to that, waiting time to complete transactions with MFIs agent is much lower than transaction in neighborhood group center 12.06 minutes vs 6.4 minutes.

Thus, by choosing digital payment facility over conventional mode of transaction, every borrower can save 11.39 minutes every time. It implies that a borrower saves 9.87 hours a year if installment frequency is weekly. However, monthly repayment schedule makes the time saving and cost saving (3.6 taka), which is insignificant. ANOVA table (table 5 in appendix 1) supports the statement to the fact that average time and cost saving between digital choice and conventional mode is not statistically significant at $P < 0.05$ which is true for the group of entrepreneurs and non-entrepreneurs too. However, education plays a significant role in bringing difference in earnings among the borrowers and their households. The household income of borrowers who completed high school or above earn statistically significantly higher ($p = 0.011$) than the households of the borrowers who did not complete high school (Table 6 in Appendix 1). Table 6(b) in Appendix 1 shows that households with women completed high school earns 26.43% [(44409.09-

35126.21)/35126.21] higher than their counterparts who did not complete high school. Nonetheless, the analysis of variance indicates that the interaction effect of adoption of digital payment, likelihood of women entrepreneurship and education dummies on time saving, cost saving, and income is statistically insignificant.

The borrowers' perceived values on the attitudinal preference of digital payments over cash transactions were captured using 5-point Likert items (11 in total) in cross-sectional survey. Before conducting further statistical analysis, it is required to combine associated Likert items into some common factors. A principal component analysis (PCA) was conducted using Stata/SE (Stata Corp, 2013). From the rotated factor matrix of table 7 in Appendix 1 we observe that factor 1 has high coefficients for V5_1 (safety concerns), V5_2 (privacy), V5_3 (comfort of transaction), V5_4 (convenience of transactions), V5_5 (time saving) and V5_6 (cost saving). Considering Big Five factors by Goldberg (1971), this factor can be labelled agreeableness factor (henceforth, 'agree' as an independent variable in further analysis). Likewise, factor 2 has highly associated variables of V5_7 (cost saving), V5_8 (risk avoidance), V5_11 (feel the need). Therefore, factor 2 may be labelled perceived attitude of risk (henceforth, 'averse' as an independent variable in further analysis). Factor 3 is highly related to V5_9 (language difficulties) and V5_10 (lack of technical skill), and this factor can be labelled adoption deterrent to digital payments (henceforth, ad_deterrent as an independent variable in further analysis). Thus, the observed variables from the PCA on borrowers perceived values are agree, averse and ad_deterrent. This is worth mentioning that, negative coefficients for negative Likert items leads positive interpretation, e.g., perceived values with regards to risk associated with digital payment in comparison to conventional mode (V5_8) is measured in negative scale which need to be rescaled by reversing the item in generating group variable of factor 2.

Existing literature (Wilson et al., 2007) suggests that education effects the efficacy of individuals and therefore, a positive correlation exists between level of education and development and performance of entrepreneurs. Thus, we include dummy variable of education (1 if a woman studied up to high school or more, 0 otherwise) as an indicator variable along with adoption of WSS facility, time saving from digital choice and factor variables identified in PCA in our logistic regression analysis. As one of the objectives of the current study is to identify the indirect effect of independent variables on the likelihood of women entrepreneurship at the presence of adoption of digital payments, we conducted to regression analyses – one on the Eq(1) and the other on Eq(2).

From the regression outputs presented in Table 9 (a) in Appendix 1, we observe that 177 observations out of 191 has been used in the analysis of model 1 and model 2, whereas 182 observations in model 3 meaning that there are 5 missing values of the t_save. The likelihood ratio (LR) chi-square for model 1 is 0.00436 with p-value of 0.9986 which implies that the model is not statistically significant. For the case of model 2 and model 3, we observe similar findings of the models not being significant.

Indirect effect of indicator variables

Unlike the previous models (model 1, model 2 and model 3), when we consider adoption of digital payment as the dependent variable, model 1_m⁸, model 2_m and model 3_m become statistically significant [Table 8(b) in appendix 1]. The likelihood ratio (LR), chi-square for model 1_m, is 37.17, with a p-value of 0.00000 indicates that this model is statistically significant. Thus, we fail to reject the null hypothesis that there is no difference between the coefficients. Among the independent variables, we observed that only 'agree' is statistically significant at $p < 0.001$. The odd ratio of agree -1.2629 indicates that one unit increase in borrowers perceived value with regards to agreeable factors, the likelihood of adopting digital facility increased by 0.2828 units⁹ at $p < 0.001$. Likewise, in model 2_m, the likelihood of adoption of digital payments is expected to increase by 0.2838 units as an effect of increasing the nature of agreeableness of borrowers. As the 'agree' has significant impact on adoption of digital payment, the perceived values of borrowers group in the factor variables likely impact the DV individually too.

For further analysis in identifying the impact of response categories, we run another ordered logistic regression by considering Likert items V5_1 to V5_6 as indicator variables. From the regression output, as presented in Table 10 in Appendix 1, we observe that the coefficients of V5_1 are negatives. As the responses of V5_1 are measured negatively (1 strongly agree to 5 strongly disagree), the relation between dependent variable and indicator variable is positive which implies that the positive change of borrowers perceptual values with regards to the safety will lead the increase of the likelihood of adoption of digital payment. However, the coefficient of category 4 of item V5_1 (- 3.124648) indicates that by increasing borrowers feel of safety from category 4 (disagreement) to neutral (3), we can find the increase of the likelihood of digital adoption by 0.04395 units ($e^{-3.124648} = 0.04395$). Our assumption on possible impact of adoption of WaterCredit loan over digital adoption is likely true to the extent that the changes of selecting the product from sanitation to water leads the increase of likelihood of adoption of digital payment by $e^{1.04167} = 2.83$ units at $p < .05$.

⁸ m stands for mediation

⁹ $e^{-1.26293} = .28282414$

In accordance with Sobel (1982), indirect effect of independent variable on dependent variable can be expressed as the linear combination of products of structural parameters. It implies that indirect effect of independent variable can be identified by multiplying the coefficients of Eq(2) with coefficient of mediator in Eq(1). The indirect effect for each of the model mediated by adoption of digital payments have been presented in Table 1. As we observe only two independent variables i.e., WSS adoption and ‘agree’ has significant indirect effect on likelihood of being women entrepreneurs mediated by adoption of digital payments. In model 3, we observe that the adoption of WSS facility has a significant indirect effect contributed to women entrepreneurs. Changes in the category of adopting WSS product from sanitation to water has mediated effect of 0.44 which is calculated as follows:

$$\gamma_{wss(indirect)} = (e^{\gamma_{wss}})(e^{\beta_{adopt}}) = (e^{1.04167})(e^{0.21652}) = 0.43817$$

And 90% confidence limits suggest that 25% $[0.43817/(0.4387+e^{0.26211})]$ of the effect of WSS facility on likelihood of being women entrepreneurs is likely mediated by changes in adoption of digital payment. The analysis of indirect effect also suggests that the changes in agreeableness of WaterCredit borrowers has significant indirect effect on the probability of being women entrepreneurs when that effects are mediated by adoption of digital payments. Likewise, the percentage of changes in ‘agree’ effecting the likelihood of being women entrepreneurs mediated by adoption of digital payments are 24%, 24% and 27% in model 1, model 2 and model 3 respectively. However, education dummy, time saving, perceptual values on risk averse and deterrents of digital payments do not have statistically significant indirect effect on the likelihood of being women entrepreneurs.

Table 1: Indirect effect of variables on likelihood of women entrepreneur mediated by adoption of digital payment

	model 1	model 2	model 3
wss	2.93193	3.03500	0.43817
educ_d	0.91270		
t_save	1.17752	1.17052	
agree	0.33368	0.33258	0.37465
averse	1.63619	1.60753	1.69054
ad_deterrent	0.78423	0.77483	0.85036
_cons	30.47053	26.31765	19.97038

Limitations and caveats

This study covers only demand side of digital payment service at borrowers' end. The operating efficiency the MFI can gain from digital payment facility is not studied. The sample size of the survey which is 191 in total, of which 40% adopted digital payment least likely allows to obtain a robust result. Nonetheless, the imbalanced distribution of number of women entrepreneurs (15%) and not-entrepreneurs respondent contribute to the endogeneity of the regression functions of Eq(1). The sample was collected from outskirts of Dhaka in Vatara, Uttara and Mugda which less likely represent the characteristics of borrowers who live in rural areas.

Concluding remarks and implications for further research

It is generally accepted that WSS spending has a profound impact on livelihood of developing countries which allow waters supply and sanitation practitioners to argue that return on WSS investments challenges the universal asset pricing theory.¹⁰ At the advent of digital payments, relatively poor women having proper facility of WSS can utilize their time in productive works. This clearly indicates the dynamics of time saving from access to WSS facility likely allows women to develop entrepreneurship. This is also borne out by case studies the paper will present. The results of this study are expected to contribute to the discourse of financial inclusion and women empowerment in Bangladesh and globally, both at the level of academic discourse and also policy implementation.

Case study and in relation with survey findings

This paper provides an evidence that access to WSS facility indirectly effects the propensity of being an entrepreneur mediated by adoption of digital payment. Considering the labor participations rate of women in comparison of their men counterpart in Bangladesh which are 36% vs 84% respectively ("World Development Indicators," 2018), for most of the women, this is likely legitimate fortune that they are to spend their time on household chores only. In last ten years from 2008 to 2018, labor participation of female is growing yearly at 2.2% which till very low. In the Muslim dominated developing countries like Bangladesh, it is likely difficult to develop business by women. If women spend most of their time in collecting water, child rearing, taking care of families, there is little scope to think about investing time in productive works that have direct financial returns. The absence of safely managed WSS facility makes women's life more hardship. Women

¹⁰ Commonly used asset pricing models, e.g., CAPM and APT are estimated as linear functions. However, the relation between investing in improved WSS facility and economic return from the investment is likely to be non-linear (e.g. exponential)

entrepreneurs like the case of Rebeka (case story 2 in appendix 2) have little scope to continue their business, Moni (Case 5 in Appendix 2) could not concentrate on her clothing shop. Access to safely managed water connections allows Kajal Rekha (Case 1 in Appendix 2), Mukta Akhter (Case 4) to spend more time in tailoring works that impact performance of their business. By getting quality water, Jarina Khatun (case 3), Mukta Akter become happy, medical expenses of Nahida Akter Sumi (case 5) reduces significantly. All these phenomenal outcomes of access to WSS signifies that development and survival of women entrepreneurs most likely depend on getting access to finance for water and sanitation products. In line with case stories, our mediation analysis shows that WSS facility has significant indirect effect on women entrepreneurship development mediated by adoption of digital payment. Therefore, we can conclude that access to WSS facility is one of the determining factors of survival and development of women entrepreneurs.

MFIs in transition of Adopting DFS

MFIs are playing significant role in the development of the country both in contributing financial inclusion and enhancing the labor force participation of women. 90% clients of MFIs in Bangladesh are women (Chowdhury & Chowdhury, 2011) and 38% of the total domestic loans was disbursed by NGO-MFI in 2001 (Haque & Rashid, 2002). Intriguing thing of the fact is that loans disbursed by the private commercial banks was two times lower than NGO-MFI in 2011. Currently, the total capital invested in NGO-MFI is only 4% of capital employed by the commercial banks (Mia, 2018). However, labor participations rate of MFI is much higher than banks. This simple comparative analysis of banking sector and MFI sector likely indicates that the people reach and coverage of MFIs are much higher than banks. When we observe increase of nonperforming loans of banks is up to 26%, MFIs are able to reduce NPL of microfinance loans down to 2.25% (Mia, 2018). Nonetheless, asymmetric distribution of bank branches in comparison of MFIs likely supports the statement that the contribution of MFIs in financial inclusion of unbaked people is significantly high. One of the major findings of this paper is that women borrowers still prefer conventional mode of transactions to digital payments. In the last couple of years, MFIs are in transition in response of the accelerated growth of DFS; some MFIs are trying to adopt digital payment service. This paper arguably helps to identify the major challenges in terms of borrowers' perceptions that limits the transition of payment mode i.e., conventional to digital. As women borrowers are surveyed using the Likert items capturing the relative preference of choices between digital payment and cash transactions, the findings in table 2(b) likely helps microfinance institutions to understand and decisions how to uplift the perceptual values of borrowers while promoting digital finance. This study reveals that adoption of digital payment allows cost and time saving at borrowers' end; however, results are not statistically significant.

The logistic regression functions and mediation analysis provide an evidence that the perceived values related to agreeableness have statistically significant impact on adoption of digital payment. It implies that safety, privacy, comfort, convenience, time and cost saving grouped in factor agree (using PCA analysis) are the most important factors that impact women entrepreneurship development mediated by digital adoption.

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Appendix 1: Survey outputs

Table 1: Likert items capturing borrowers attitudes towards digital payments

Items	Attitudinal statements
V5_1	I think paying installment through bKash agent is safe
V5_2	I think paying installment through bKash agent allows me to maintain my privacy.
V5_3	I would feel more comfortable to go to bKash agent than going to group center.
V5_4	This is more convenient to pay installments through bKash agent than attending group centre
V5_5	I think paying installment through bKash agent instead of going group center allows me to save time.
V5_6	I think paying installment through bKash agent instead of going group center allows me to save money.
V5_7	I think paying installment through bKash agent instead of going group center is costly.
V5_8	I think paying installment through bKash agent instead of going group center is risky for me.
V5_9	I think paying installment through bKash agent is less preferable due to difficulty of understanding English
V5_10	I think paying installment through bKash agent is less preferable due to technical difficulty of using it.
V5_11	I think paying installment through bKash agent instead of going group center is not necessary.

Notes : reponse options are 1 for Strongly agree, 2 Agree, 3 Neutral, 4 Disagree, and 5 Strongly disagree

Table 2 (a): Binary responses of WaterCredit borrowers

SL	Categories	Yes(%)	No(%)
1	Do your family own this house	39.8	60.21
2	Do you own any land here	38.4	61.58
3	Are you an entrepreneur	15.2	84.82
4	Have you adopted WaterCredit loan for water facility	86.2	13.83
5	Have you completed high school	46.1	53.93
6	Do you have mobile wallet account	40.2	59.79
7	Do you go to MFS agent yourself to make payments (or receive money) every time?	62.3	37.7
8	Do you feel worry about your installment after making a cashless payment?	47.5	52.46
9	Do you think you still need some document as a proof of your digital payments	82.7	17.3
10	Do you think text SMS is enough in confirming payment?	40.3	59.68
11	Is your Rocket (bKash) agent very friendly?	96.9	3.07
12	Do you feel discomfort in paying installment in group center?	17.8	82.21
13	Are your family members supportive in cashless transaction?	85.4	14.65

Table 2 (b): Perceptual responses of women borrowers (%)

<u>Likert items</u>	<u>Strongly disagree</u>	<u>Disagree</u>	<u>Neutral</u>	<u>Agree</u>	<u>Strongly agree</u>
V5_1	14.29	37.57	15.87	19.58	12.70
V5_2	8.90	36.65	28.80	17.80	7.85
V5_3	16.75	40.31	12.04	26.18	4.71
V5_4	8.90	57.59	17.28	14.14	2.09
V5_5	18.32	41.36	20.94	17.28	2.09
V5_6	12.57	41.36	27.23	18.85	0.00
V5_7	10	45.26	27.89	13.68	3.16
V5_8	2.09	13.61	19.37	48.17	16.75
V5_9	31.22	41.27	14.29	12.17	1.06
V5_10	17.46	47.62	22.22	11.11	1.59
V5_11	2.66	10.11	25.53	35.11	26.6

Table 3: Univariate statistics

SL	Variable	n	Mean	S.D.	Min	0.25	Mdn	0.75	Max
1	Borrowers age	191	36.83	8.97	21	30	36	43	80
2	Total member in the family	191	4.57	1.4	1	4	4	5	12
3	Number of children (< 16 years)	191	1.43	1.01	0	1	1	2	5
4	Number of school going family member	191	1.09	0.87	0	0	1	2	4
5	Monthly family income	191	39,403	28,820	3,000	22,000	30,000	50,000	200,000
6	Respondent's monthly income	142	6,465	10,306	-	-	3,000	10,000	60,000
7	Amount of WaterCredit loan taken	191	25,508	26,018	5,000	10,000	20,000	30,000	220,000
8	How much time do you need if you go to the MFI's group center on foot (in minutes)	186	9.68	11.48	0	4	5	10	70
9	How much time do you need if you go to nearby MFS agent on foot (in minutes)	191	6.7	7.37	0	2	5	10	60
10	How much time do you need to wait to finish your transaction at group centre (in minutes)	191	12.07	11.22	0	5	10	15	60
11	How much time do you need to wait to finish your transaction at agent point (in minutes)	191	6.4	6.84	0	2	5	10	60
12	Time saving from the choice digital payment per month (in minutes)	186	11.39	30.72	-114	0	3	20	185
13	How much will it cost to go to group center if you go by rickshaw? (in taka)	189	9.81	11.16	0	0	10	10	50
14	How much will it cost to go to agent point if you go by rickshaw? (in taka)	191	6.31	8.99	0	0	0	10	50
15	Monthly cost saving from the choice of digital payment (in taka)	189	3.6	12.88	-50	0	0	10	50

4 (a) Group difference of time saving: ANOVA results

Source	Partial SS	df	MS	F	Prob > F
Model	253.09171	3	84.363905	0.09	0.9665
dfs	21.165236	1	21.165236	0.02	0.882
women_ent	198.77066	1	198.77066	0.21	0.6493
dfs#women_ent	52.450055	1	52.450055	0.05	0.8152
Residual	174327.26	182	957.84208		
Total	174580.35	185	943.67757		

4 (b) Time saving among the groups

Payment	Women entrepreneur		
	Not entrepreneur	Entrepreneur	Total
Non-DFS	10.7	15.07	11.33
DFS	11.24	12.64	11.46
Total	10.96	13.86	11.39

5 (a) Group differences of cost saving: ANOVA results

Source	Partial SS	df	MS	F	Prob > F
Model	404.65669	3	134.88556	0.81	0.4897
dfs	57.312003	1	57.312003	0.34	0.5581
women_ent	237.72675	1	237.72675	1.43	0.2336
dfs#women_ent	5.4686845	1	5.4686845	0.03	0.8564
Residual	30798.783	185	166.47991		
Total	31203.439	188	165.97574		

6 (a) Group differences of family income: ANOVA results

Source	Partial SS	df	MS	F	Prob > F
Model	5.81E+09	3	1.94E+09	2.38	0.071
educ_d	5.35E+09	1	5.35E+09	6.58	0.0111
women_ent	214329777	1	214329777	0.26	0.6082
educ_d#women_ent	1.55E+09	1	1.55E+09	1.9	0.1693
Residual	1.52E+11	187	812900843		
Total	1.58E+11	190	830620832		

5 (b) Cost saving among the groups

Payment	Women entrepreneur		Total
	Not entrepreneur	Entrepreneur	
Non-DFS	4.11	6.79	4.49
DFS	2.08	5.71	2.64
Total	3.14	6.25	3.6

6 (b) Family income among the groups

Education	Women entrepreneur		Total
	Not entrepreneur	Entrepreneur	
Below high school	35852.27	30866.67	35126.2
High school and above	42675.68	53571.43	44409.1
Total	38969.14	41827.59	39403.1

Table 7: Rotated factor loadings

Variable	Factor1	Factor2	Factor3	Uniqueness
V5_1	0.7652	0.0717	-0.315	0.3101
V5_2	0.7692	0.0101	-0.3407	0.2922
V5_3	0.7712	0.3972	0.0053	0.2475
V5_4	0.6288	-0.1217	-0.0314	0.5889
V5_5	0.7656	0.2979	0.1305	0.3081
V5_6	0.6596	0.3809	0.3179	0.3189
V5_7	0.238	0.7068	0.017	0.4435
V5_8	-0.2028	-0.8189	-0.0919	0.2798
V5_9	-0.08	0.019	0.9242	0.139
V5_10	-0.0377	0.2244	0.863	0.2035
V5_11	-0.0799	-0.8075	-0.2007	0.3013

LR test: independent vs. saturated: $\chi^2(55) = 1054.17$ Prob> $\chi^2 = 0.0000$

Table 8: Logistic regression analysis of 191 WaterCredit borrowers on Eq(1) and Eq(2)

	Variable	model 1	model 2	model 3	model 1_m	model 2_m	model 3_m
(a) DV	women_ent						
Independent variables	adopt	0.16535	0.15849	0.21652			
	wss	0.22624	0.20335	0.26211			
	educ_d	0.12826					
	t_save	0.00248	0.00211				
	agree	0.04529	0.04402	0.01985			
	averse	-0.058	-0.0538	-0.0204			
	ad_deterrent	0.10066	0.10178	0.1655			
	_cons	-2.3088	-2.2282	-2.4432			
(b) Mediator	adopt						
Independent variables	wss				0.91031	0.95172	1.04167*
	educ_d				-0.2567		
	t_save				-0.00194	-0.00104	
	agree				-1.26293***	-1.25936***	-1.19828**
	averse				0.32702	0.31621	0.30853
	ad_deterrent				-0.4084	-0.4136	-0.37861
	_cons				3.25141***	3.11175***	2.77773**
Statistics							
N		177	177	182	177	177	182
r2_p		0.00436	0.00378	0.00625	0.15592	0.15373	0.14493
chi2		0.65962	0.57191	0.97641	37.17155	36.65004	35.52739
p		0.99863	0.99685	0.96445	0.00000	0.00000	0.00000

legend: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 9: Indirect effect of variables on women_ent mediated by adopt

	Indirect Effect (percent)					
	model 1	model 2	model 3			
wss	2.93193	3.03500	0.43817	70%	71%	25%
educ_d	0.91270			45%		
t_save	1.17752	1.17052		54%	54%	
agree	0.33368	0.33258	0.37465	24%	24%	27%
averse	1.63619	1.60753	1.69054	63%	63%	63%
ad_deterrent	0.78423	0.77483	0.85036	41%	41%	42%
_cons	30.47053	26.31765	19.97038			

Table 10: Logistic regression of perceptual items

Ordered logistic regression

Number of obs = 187

LR chi2(23) = 76.96

Prob > chi2 = 0.0000

Log likelihood = -87.843238

Pseudo R2 = 0.3046

adopt	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
V5_1						
2	-2.412325	1.369198	-1.76	0.078	-5.095904	.2712536
3	-2.619418	1.472997	-1.78	0.075	-5.506438	.2676026
4	-3.124648	1.532184	-2.04	0.041	-6.127673	-.1216218
5	-2.932657	1.66466	-1.76	0.078	-6.195331	.3300174
V5_2						
2	2.640047	1.450406	1.82	0.069	-.2026955	5.48279
3	1.82253	1.529845	1.19	0.234	-1.175911	4.820972
4	2.125392	1.681729	1.26	0.206	-1.170736	5.42152
5	1.160582	1.822656	0.64	0.524	-2.411757	4.732922
V5_3						
2	-.0743964	.6895556	-0.11	0.914	-1.4259	1.277108
3	-1.915013	.9751461	-1.96	0.050	-3.826264	-.0037616
4	-1.135566	.95839	-1.18	0.236	-3.013976	.742844
5	15.71702	1316.759	0.01	0.990	-2565.084	2596.518
V5_4						
2	-1.090623	.9519451	-1.15	0.252	-2.956401	.7751547
3	-1.059409	1.187181	-0.89	0.372	-3.386241	1.267423
4	.0526963	1.183875	0.04	0.964	-2.267657	2.37305
5	-15.49337	1316.76	-0.01	0.991	-2596.296	2565.309
V5_5						
2	-1.989605	.8631637	-2.31	0.021	-3.681375	-.2978349
3	-.8263604	1.102119	-0.75	0.453	-2.986474	1.333753
4	-.8160041	1.309652	-0.62	0.533	-3.382874	1.750866
5	-2.185997	1.783234	-1.23	0.220	-5.681072	1.309077
V5_6						
2	1.230801	.8720717	1.41	0.158	-.4784285	2.94003
3	1.187796	1.036613	1.15	0.252	-.843928	3.21952
4	-.7026962	1.222466	-0.57	0.565	-3.098686	1.693293
/cut1	-2.682447	1.084862			-4.808737	-.5561563

Note: 5 observations completely determined. Standard errors questionable.

Appendix 2: Case studies

1. Kajal Rekha

The house of Kajal Rekha is located at Manikdia in the outskirts of Dhaka city. Her father had a fish trading, and mother was a house wife. All her uncles were involved in the fish trading, they were 5 brothers and 2 sisters. She has a tailoring business. She sells sheet cloths, three pieces, etc. Her tailoring house is next to the road, adjacent to the school. Her customers are mostly the locals, but she also has customers from other areas. She currently has five sewing machines in the shop. These machines are used to meet the customer demand. She employed 3 tailors, 2 others are working as assistants. Kajal Rekha has 3 sisters. The second eldest sister works in her shop. The eldest one has a different business. 31-year-old Kajal Rekha has a daughter. Her husband works as a cook in a hotel. She had to stop her study after class five in BRAC school. Her eldest sister used to work in a garments factory. She suggested her to learn tailoring. Kajal Rekha was very young that time, she enjoyed playing, and roaming the most. She used to work as maid in others' houses, and used to earn TK. 30 that she used for meeting her own needs. The eldest sister rebuked her one day "do you enjoy working as maid? Why are you not learning tailoring?" that touched her. She thought, her eldest sister called her the maid, the neighbors must call her the same. Once, she determined, she must learn tailoring. That sister herself talked to a tailor master, Mr. Anser Ali. The master had a tailoring business. There were four workers, two males, and two females. She used to learn tailoring there along with another. The master used to know that the economic condition of Kajal was not sound. Hence, Mr. Anser Ali, the master, taught her everything about tailoring in two years. Thus the life of Kajal Rekha changed. Before starting the tailoring business, she used to work at home.

She did not have her own sewing machine, she bought a used one for TK. 1500. Her father bought a scissors for TK. 100. It has been 10 years she started the tailoring business, she owns a business organization now, and everyone knows her as the owner of that organization. She started the business borrowing TK. 14,000 from the MFI. She operated the business for six months at her home purchasing three piece cloths, and later rented a small shop. She shifted to a big shop after another six months.

She borrowed another TK. 30,000 from the MFI, and installed a submersible water pump. Previously they used to collect water from one tube well along with some other neighboring families. They used to use the water for cooking, drinking, cleaning the houses, and so on. They used to stand in queue for collecting water, which used to take long time. Her mother used to collect water for her 9-year-old school going daughter for bath, otherwise the bath was not possible. After the installation of the submersible pump, the water is now only a matter of one switch on. They just need to turn the switch on to refill the water tank. After returning from work, she takes shower quickly. In the afternoon, she takes lunch after shower, and returns to work. Thus the installation of submersible water pump saves her lot of time. Kajal Rekha does not have bKash or Rocket mobile banking accounts. She has an account in Al-Arafah Bank which was opened for drawing the loan. She did not require opening an account in bKash or in Rocket, hence has not opened yet. She takes the decision on which school her daughter should be admitted. She consults with her husband when necessary for any kind of decisions. Her economic condition is now better than her other 3 sisters. Therefore, she took the responsibility of her parents to look after.

2. Rebeka

The native house of Rebeka is located at Bhanga Upazila in Faridpur district. She has three brothers, and one sister. Among the siblings, Rebeka is the youngest one. She rears cows, and her husband works in a grocery shop. They have one son, and one daughter. The son stopped studying after class five, and now runs a grocery shop. The daughter is studying in class X and will appear in the S.S.C exam next year. Her parents used to rear cows in the village home in Faridpur. After she left her parents' home marrying her husband, she also started rearing cows. She is involved in rearing cows for last 10 years. Now she owns two cows. In her own statement "I will fall sick, if I don't work. I rear cow, because it keeps my health sound". Rearing cow is not only keeping Rebeka's health sound, it is also contributing to the economic development of her family.

At the beginning, it was her husband who provided her the money to purchase cows. At first, she only bought one cow, that was the beginning. It increased to two, and from two to four. After a certain time, when the cows become healthier and heavier, she sells them in the market with higher profit. She uses that money for meeting different family needs. She stocks several cows for future sale. Since the beginning, she always has 2 - 4 cows in stock. She took loan from the MFI twice, TK. 50,000 at the first time, and TK. 70,000 at the second time. She purchased some jewels with the money she borrowed second time, and installed a submersible water pump with the money she borrowed first time.

The installation of submersible water pump cost TK. 1,50,000. She used money from her savings including the loan for installing the deep tube well two and half years ago along with a water tank of 1,000-liter capacity. Since then, it is the source of water for their cooking, drinking, and even water for bathing the cows. Previously they had a manual tube well, which was hard for water collection, and did not have enough water. Due to the water layer going deeper in the dry season, the problem becomes more prominent. Rebeka wanted to close her lovely small farm due to water crisis. For rescuing themselves from that trouble they had to resort on the motor system. It also failed to extract enough water due to lesser capacity. For this reason, she finally installed a submersible water pump. She says "Previously it used to take a long time to extract water. Now it is only a matter of pushing a button to fill a tank". If it is two minutes late to turn the switch off, the water overflows. The milk dealers collect the milk from Rebeka's house. Since, she is the owner of the cows, she takes all the decisions herself relating to that. Sometimes, she takes loans, repays the loans, and deposits money on savings account. She repays the loans timely, and resultantly can retake loans whenever necessary. She manages the cooking, and milking the cows herself. She requires her husband's help for removing the cow-dung from the shed. Rebeka repaid the loan payments through bKash. She did not have bKash account, she used to send the money through agents. However, her son has a bKash account. She says "If the repayment is sent through bKash, MFI's staffs do not need to come to my house physically. The success of the money transfer can also be confirmed through the messages. It is very convenient. If the system is continuous, will be great for loan repayments".

3. Jarina Khatun

Jarina Khatun is a very hard-working woman. She runs a hotel business. Her husband has some problems on his eyes, he does not have clear sights. Hence, she needs to do everything including handling the cash at the counter, purchasing goods for the hotel, cooking and so on. If her husband handles the cash at the counter, the customers cheat on him demanding change for TK. 500 while paying him TK. 100. Her husband also cannot differentiate between notes, and gives the customers TK. 50 as change instead of TK. 10. Before he suffered from the sight problem, he owned a rickshaw

garage. It could accommodate 30 rickshaws together. He also used to slaughter cows once a week, and sell the meat. Jarina used to be a simple house wife then. She used to do nothing but the household works. They fall in a deep trouble, after the sight problem of her husband was diagnosed. What can they do now? There is no other way but selling the properties! In the meanwhile, they heard that the owner of a hotel was quitting the rental. The husband and wife took a decision that they will start a new struggle for living with the hotel. The husband thought Jarina might not be able to manage the hotel at the beginning, but proving her husband false, she is successfully managing the hotel with strong hand. She employed a worker in the hotel, who makes *Parata, Singara, Samosa*, etc., and get paid TK. 500 daily. Jarina cooks 15 kg rice, vegetables, fishes, chicken, mutton, etc. by herself every day. During Ramadan, she sells chicken soups, noodles, etc. instead of rice. She made the hotel very popular in the area. If the hotel is closed one day, the locals say “Missing the food in Jarina’s hotel today”. She is very careful about cleanliness and hygiene. When other hotels have raids by mobile court due to cleanliness and hygiene issues, Jarina’s hotels has a completely different picture. Even the police officers stop their car, and eat in her hotel complementing her cleanliness and hygiene practice. The hotel has the water supply from WASA. She bought a big water filter borrowing TK. 10,000 from the MFI considering drinking direct water from WASA supply will not be hygienic. The filter has three taps for cold, warm, and normal water. She already repaid all the money borrowed from the MFI. She, previously did not have a water filter, she used to pay TK. 500 per month for a hired filter, and TK. 150 for each jar of water. Even though, she only took TK. 10,000 as loan, she purchased a big water filter for TK. 30,000. She managed other TK. 20,000 from her savings. Jarina, the successful woman in hotel business, has already purchased some land property with the money from her savings. She used to save some money, even before she started the business. She has a bank account with Agrani Bank. She does not have an account on bKash, but her son in law has one. She transacts money through bKash agents, when required. She does not have clear knowledge on bKash functions, as she is not much educated that causes her being scolded by her daughters sometimes. The successful woman entrepreneur is planning to build a house drawing a big loan in future.

4. Mukta Akter

Mukta Akter lives at the Piyar Ali road in Badda. Mukta’s village is in Muladi of Barishal district. Mukta runs a tailoring shop which is close to the flat where she lives at Badda Piyar Ali road. Mukta’s mother had a tailoring business also. Besides studying, Mukta learnt the tailoring from her mother. The six workers, who are working in Mukta’s shop, are women. At first, Mukta started her business with two sewing machines and after this, she added a new machine. At present, the numbers of her machines are six which contain the model Jack & Jocky. Mukta leads all the responsibilities including paying wage, managing assistant tailors, purchasing materials and nearly all sorts of activities related to her business. In Mukta’s sewing factory, retailers make jackets, suits and shirts. Mukta was not like at any business before. Her husband had joint tailoring business with his business partner and uncertainly the partnership was discontinued. After this, Mukta’s husband started a job in a company and as Mukta was taught the tailoring work by her mother, she also started a job in the same textile factory. They both were doing their job in the same organization but all the time she had been struggling managing all sorts of household and factory works – commuting from home to work by public bus, cooking after coming back from work, hectic works in the factory. All these workloads used to make Mukta sicken, very often. Then Mukta decided that she would start a tailoring business and she converted a room of her flat to business point and thus change came in Mukta’s life. She became a business owner from job holder. She is a member of the MFI for four years and within these four years she borrowed four times amount of 20,000 taka,

40,000 taka, 50,000 taka and 60,000 taka respectively. In order to ensure taking safe water, she bought a water filter which costed 10,000 taka and she managed it from the loan amount taken last year. Before using filter, she used to boil water for drinking. It tastes better to drink filtered water than boiled water. Mukta has no bKash or rocket account or any bank account.

5. Nahida Akter Sumi

The village of Nahida Akter Sumi is in Feni. Couple of years back she moved to Dhaka and at present she lives in a rented house at Mugda in Dhaka. Sumi has two shops, one of them is pharmacy and another one is clothing shop. Usually her husband takes care of the pharmacy and she manages the clothing shop. Sumi works at the pharmacy from 6:00pm to 12:00am after completing her works at cloth shop. They have two sons and single daughter. Their elder son has started his job after completing A-level from Oxford English Medium School at Dhanmondi in Dhaka. Their daughter is also studying standard-seven in the same school. Their younger child, the second son is going to a pre-school. Sumi is also educated, and she did a bachelor's in business administration. Her husband was continuing a pharmacy before their marriage. After marriage Sumi started her clothing business separately by her own savings. Sumi thought of looking for a job, but her cousin suggested her to do business. Then she discussed with her husband about business and her husband also inspired her for this and said, "At the early age, nobody knows business well, incurring loss several times in common when some invests in any business, then everything goes fine". Sumi did expose to any loss in doing business. Though she had no profit at the starting time, she just stayed on the break-even at that time. And now Sumi says, "If there is no profit in my business, how am I able to send my children in the Dhanmondi Oxford School?" Sumi is a member of the MFI for two years and she took loan twice. She borrowed 74,000 taka last time. She bought a water filter for her family by 15 thousand taka which was managed from the last loan amount. Before buying filter, they used to drink boiled water. Though she used to take boiled water, her children used suffer in stomach problems very often and Sumi needed to spend handful amount of money every month buying medicine for them. After buying filter her children are free from stomach problems now. Thus, Sumi can save the money which could be spent for medicine otherwise. The time of boiling water is saved and now she can serve 10 customers more customers. It is true that Sumi wants to spend more time for her children than doing business.

She has acquired enough business techniques now. She has certain numbers of regular customers and she do business with them keeping a minimum profit. Beyond the minimum profit gained from these customers is enough for her to survive and sustain. When Sumi would have to boil water, wait for get the boiled water room temperature, and filter it before use, after owning quality water filter she can invest her time selling cloths, three-pieces. Now, Sumi is happy with her business and family.

6. Moni

Moni has a clothing shop. Moni's shop is not like what we visualize of a conventional shop. Because, Moni sells cloths at footpath in front of her house. Moni keeps it open only for the first half of a day, from morning to the noon everyday. The customers who want to buy cloths in the afternoon, they usually go to her house directly as all of them are known to her. Moni's family was not familiar with any business before. Her father and uncles were job holder. Moni's father had one brother and two sisters. Monis' are four sisters and one brother, and her brother works as a painter. Of them, Moni is the only person who is doing business. Moni's husband had a clothing business and so Moni was

inspired to do similar business. Now they have two shops, one is owned by her husband and another is her own. Moni covers all the responsibilities of the business herself including buying cloths for her shop. She is running this footpath-shop for about 15/16 years. At the very beginning, she started cosmetics business and she used to sell bracelets and other cosmetics items. Then she shut down the cosmetics business and started the cloth business selling three pieces, two pieces, one piece except *shari*. Moni told that there are demands for normal dresses and *orna* in the market. Moni, 45, is not well educated, she just had studied till primary level. But she feels quite comfortable doing business – counting profit and loss. Her first investment was 25 thousand taka. Now, he is gaining more profits and savings is increasing day by day. Moni has been a member of the MFI for three years. She borrowed twice - 50 and 70 thousands from the MFI and invested it in her business. By taking another loan of 20 thousand taka she bought a water filter for her family. “How did she manage safe water for her family before buying water filter?” She used to collect water from water points provided by local government located in their neighborhood by maintaining queue which was troublesome and time consuming. Thinking about the fetching water, she had to be stressful most of the time when she was busy dealing with customers. Sometimes she had to run to collect water keeping behind her business. On that crucial days, she had to spend about 7,000 taka monthly just for water. Now she has overcome all problems related to water. She can do her business attentively and there is no need of spending money to buy safe water regularly. Moni is bearing the education cost of her three daughters who are studying in schools. Her elder daughter is married, second daughter is in grade five and the younger daughter is in grade four. Moni did not open any bKash account considering that her nature of absenteeism mind sometimes lead to loss mobile phones. She has an account in Janata Bank. Moni dreams that, she will have a permanent infrastructure of her business shop like the others, not in footpath.