

# Borrowers satisfaction evaluation from Microfinance institution by Using FCEM

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## Research Article

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# Borrowers' Perception analysis of microfinance effectiveness with fuzzy comprehensive evaluation method

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**Abstract:** Boundless researchers have made efforts to assess the impact of Microfinance on poverty reduction both positively and negatively, but the perception of borrowers about the effectiveness of Microfinance has not been yet found. This study adopts the Fuzzy Comprehensive Evaluation Method (FCEM) in conjunction with the Analytical Hierarchy Process (AHP) to evaluate the level of satisfaction of borrowers with the products and services of microfinance institutions at different criterion levels. The goal is to assess the level of satisfaction for each criterion level under the degree of satisfaction of the borrower about the product and services provided by Microfinance Institution (MFI). Findings show that the claim of MFI was false because study evidence makes it clear that borrowers are not satisfied with the product and services of MFI. In addition to the literature, this study also highlighted the weakness of the MFI product and services. Thus, both the government and the MFIs can improve their performance and change their policies for the welfare of the borrowers.

Keyword: Microfinance effectiveness; Borrower Assessment: FCEM, AHP

## Introduction

Microfinance has been recognized over the past half-century as a protective shield against poverty, an instrument for poverty alleviation [1], and the main armament of financial strategies to tackle poverty [1][2] in less developed and developing countries. Microfinance is as widespread [3] in Pakistan as in other countries. Microfinance has become the focus of attention [4][5], especially for the 1.9 billion poor who make up about 36% of the world's population. Even the expectations attached to microfinance have not been fully met to date [6], and the literature does not provide sufficient information about it [7][8][9]. Microfinance began initially been to reduce poverty [10][11] and empower women [12], but the prevalent literature suggests that microfinance has transitioned from a non-profit to a profit organization [13][12][14] and that there is no longer any intention of reducing poverty [15][16][17]. A microfinance company in the United States produced around \$33 billion in profits from a poor household [18].

Similarly, a Mexican microfinance bank named Compart Amos Banco scammed of \$400,000, Indian SKS microfinance scammed of \$350 million, [19], and Ms. Haseena Wajid, Prime Minister of Bangladesh, condemned MFIs in Bangladesh as "sucking blood from the poor in

the name of poverty alleviation". In fact, the World Bank report shows that the microfinance industry receives \$60-100 billion and 200 million customers from 2000 to 2015, but microfinance remains committed to serving the poor [20]. In short, MFIs are financially crippling millions of peoples [21] and also pushing them into the well of poverty in developed, developing and least developed countries. A popular saying "Debt is the worst poverty" and MFIs are mounting a culture of debt [13][22][23]. MFIs add dependency, strain borrower, undermine the poor by saddling them with unsustainable debt [24] instead of easing poverty [25].

Numerous studies have found that microfinance has not increased income [26][27][28] instead led poor households into debt traps [13][18]. Similarly, several studies in 18 countries suggest no substantial advantages found for the well-being of the poor with microfinance [7]. It is not a radical point of view. A comprehensive review of existing evidence supported by the Department for International Development [13] indicates that the microfinance craze was built on sand foundations. There is no clear indication yet that microfinance programs have significant outcomes [10].

Furthermore, there is still no significant evidence to support the argument that microfinance is a viable method of poverty alleviation, while poverty reduction [29] and well-being are still curable [13][30]. However, many studies have reported a significant impact on poor design. In short, microfinance simply worsens poverty [31] as microfinance loans are generally used to buy all the basic needs [25] that a person need to survive [25] and precautionary demand such as medical expenses[32]. Previous studies demonstrated that borrowers' well-being is not concerned [7] and nobody cares about the borrowers' happiness or satisfaction, even though customer satisfaction is the first priority for any firm, factory or institution globally.

Poverty is a problem in and of itself, and MFIs worsen poverty [21] by focusing on the poor population of developed and developing countries worldwide. MFIs exacerbate poverty in general, as MFIs loans are primarily used to meet precautionary demands [33] that the poor cannot afford. [32]. As borrowed sums have been spent, this stimulates demand for new borrowing to repay the old ones, leaving the poor in debt cycle [22]. In some cases, it has been observed that microcredit specifically issued for income-generating operations to help the vulnerable [1], but when a small enterprise was intended to be funded, it was widely seen that these businesses struggled due to a lack of market experience and inadequate customer demand, resulting in business loss and borrower being trapped in over-indebtedness [34]. In this situation, however, MFIs are taking advantage of the opportunity to charge an interest rate overprice [34][35]. In short, it can be seen that "microfinance is an organization that has widely accepted a method that accumulates money from the poor people [36][37] irrespective of their welfare [37]. The above controversies prove that the debtors are not satisfied [38] with the MFIs even though they are stalemated because of their poverty and inability to take loans.

## **Research problem**

The microfinance industry is experiencing significant growth: "commercial banks have begun to target MFIs' traditional customers, new MFIs have continued to be established in

the microfinance industry, and the microfinance clientele is becoming more sophisticated in terms of the quality of service they require or expect." These factors may have a negative impact on the MFIs. Since the microfinance industry has focused on aggressive competition and profit maximization, it has lost its ability to maintain control over its customers. This straightforward explanation demonstrates why financial institutions are concerned about customer satisfaction and consideration. To survive in a competitive environment, MFIs "pay attention to understand their customers' preferences and priorities. Researchers claimed a contradiction between MFI's objectives and actual activities because MFI's had become a profit-earning organization [13] rather than a promising role in focusing on poverty [14]. The most pressing problem of profit-oriented microfinance is striking a balance between institutions and the borrowers because commercialization [13] of microfinance is getting away from its social purpose and affecting client satisfaction [39][40]. Borrower satisfaction is allied with desired amount of loan, lower cost of loan easy access of loan and polite behavior of MFIs' employees which is overlooked till now. Similarly, the evaluation of Borrowers' satisfaction from the microfinance loans' outcomes like economic impact, social impact and socio-economic improvement are also ignored. The only thing that has been unheeded so far in the previous studies is whether consumers are happy with microfinance services [39], and if so, what is their level of happiness? There are a number of consumer issues that need to be addressed with the hard efforts of researchers as the study of microfinance desperately needs to determine whether the products and services provided to the consumers meet their needs or satisfy them[41]. Borrowers' satisfaction means that borrowers get the desired loan amount, the interest rate & the other charges are affordable, borrowers are happy with the MFI's services, and the loan easily meets the social and economic needs and improves their socio-economic lives. Furthermore, the attitude adopted during the delivery of these goods and services does not hurt the borrower's self-esteem. Researcher reveals that studies about borrowers satisfaction in accordance with the services of microfinance institutions are found to be very infrequent [42]. Poverty remains incurable all over the world, and the poor borrowers appears unsatisfied and disappointed until multiple MFIs operate in developed, emerging, and developing nations. In addition, MFIs plan to issue loan to group of women or individuals who already have fair sources of income [13] and less to poor borrowers [42]. Similarly, MFIs intend to monitor borrower's savings instead of their business growth or lone usage monitoring which is the primary objective of MFIs [43]. They have no concern about where borrowers have consumed lending money or what the borrower's business requirement are? Or what money does the borrower take from them for? Under the prevailing circumstances, investigating the origin and disclosing the secrets of microfinance institutions through a comprehensive study becomes mandatory. Through empirical study, it is only possible to assess how poor people were trapped in an endless debt circle. Poor people in debt traps have long endured and exploit [44] because of political power, policy support, lack of awareness, lack of accountability and poor law and order.

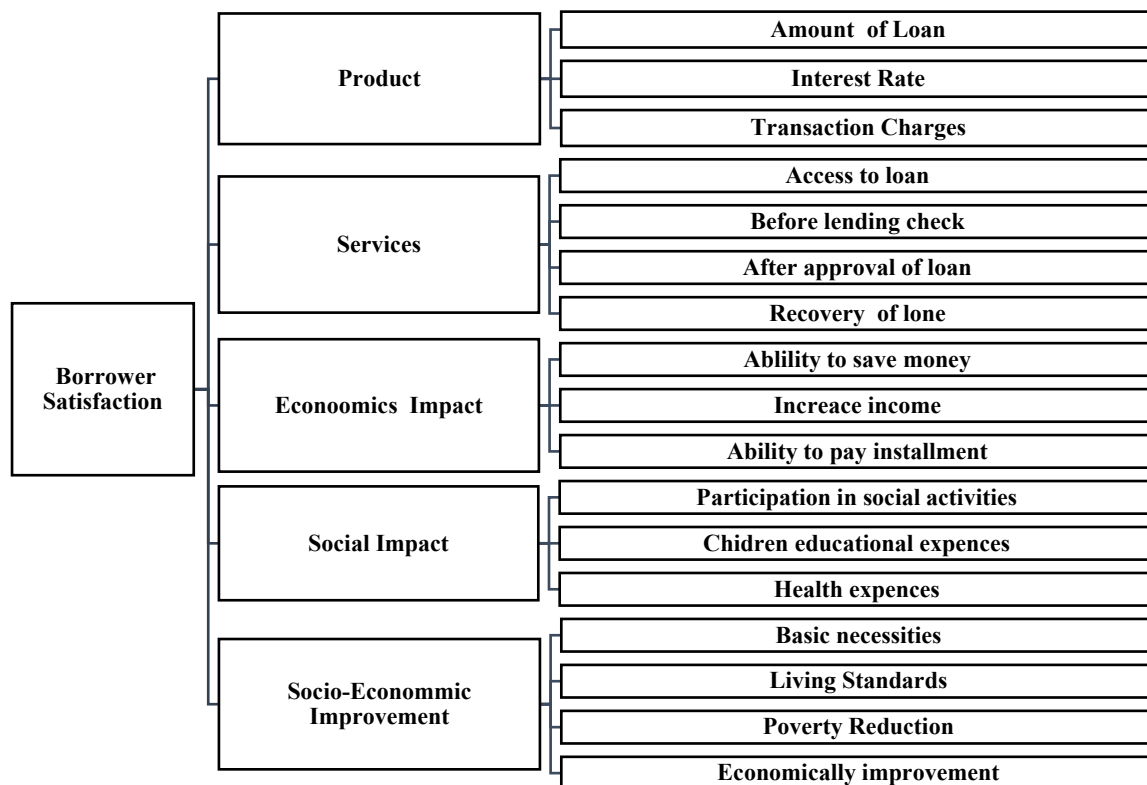
### **Significance of the study:**

The technique of analysis (FCEM and AHP) and the subject matter of this study are both

significant aspects of this research (borrower satisfaction). The fuzzy evaluation method is the most effective way to describe the complex concept of borrower satisfaction. There are multiple factors that contribute to borrower satisfaction, and each factor is made up of different items that contribute to imprecision in the information collected. FCEM is the best solution for dealing with the vagueness. Furthermore, this study is being conducted because microfinance institutions don't care whether borrowers are satisfied. However, to deliver financial goods and services to consumers, institutions must ensure that the goods and services they provide are in line with the consumer's preferences. By its very nature, this study holds a unique position in the literature because the factors described for the satisfaction of microfinance consumers have not been worked on before. Such a study sets a new direction for investigators and highlights borrowers' problems being exploited by microfinance institutions. This study is also essential for countries like Pakistan because most borrowers are illiterate; MFIs are exploitive, harsh, or abusive toward them due to their weakness. In addition, the rights of millions of people worldwide have been emphasized, especially the people from countries like Pakistan who are borrowers of microfinance institutions. The proposed study makes a clear distinction between the objective and practice intention of MFIs. The study invites the government to revise policy regarding microfinance because poverty is still mendable in the region. It is also a pathway for policymakers and researchers to review the problems and deal with facts. This study would boost and improve the researcher's information and encourage them to redefine the objective. This study has rich information for both who have or have not been trapped by MFIs. For MFIs, this study also has helpful information on borrowers' assessment regarding the quality and services of products.

### **Socio-economics reasoning of borrowers' satisfaction**

The study sets out a five-pronged approach to the satisfaction of borrowers, including all factors that are directly linked to the satisfaction of consumers who are using microfinance loan. This study measures the satisfaction of the borrowers with the MFIs products, services and the outcomes of utilizing the loans. Since the poor are powerless and have no choice but to take loans because of their poverty. As MFI's product and services are offered to the poor borrowers for their business or agricultural operation. They can uplift their income and life standard, drag away from the poverty line, improve their socio-economic life and enhance their participation in social and economic activities. Borrower's satisfaction is therefore directly linked with the socio-economic factors, products and services of MFI [45]. The product of the MFI is defined as the amount of loan [45], interest rate, and service charges, while services mean the behavior of MFI staff such as access to loan [45], before lending check, after approval of loan and behavior during loan recovery. There are five levels of criteria covering seventeen factors that describe borrower's satisfaction which is associated with the microfinance. Figure 1 best describes this conceptual relationship of borrowers' satisfaction with these factors.



**Figure 1 Relationship chart of Borrower’s satisfaction with the Microfinance Institutions**

The product is the most important and primary factor determining borrowers’ satisfaction. A quality product possesses the ability to satisfy its users. Borrowers’ satisfaction will increase if a quality product is available at an affordable price; otherwise, it unsatisfied its users. Similarly, microfinance institutions also possess a product called Microloan or Microcredit (25), a combination of three components, like amount of loan, interest rate, and transaction or processing charges. The most critical determinant of borrower satisfaction is the cost of loan, which includes the institution's interest rate and service charges. According to the researcher, a borrower is paying about 60% of the cost of the loan as interest and other charges collectively[46]. All these three factors define the quality of a product and determine the level of satisfaction of its users. As the marginal utility of money for a poor person is always higher than that of a rich person, a higher loan, lower interest rate, and fewer other charges are more satisfactory for a borrower.

Services of microfinance institutions refer to the behaviour of employees of microfinance institutions that are adopted during the provision of loan to the borrower. MFIs' services are categorized into four categories: access to the loan, before the lending check, after loan approval, and recovery of the loan. The simple terms and conditions of MFI’s loan services quickly get the borrowers' attention [47]. Good behaviours of employees of MFIs during disbursement and recovery of loans also raised the degree of the serenity of the borrowers. The institution's tight and strict policies discourage poor borrowers and increase their disappointment. Numerous authors have reported cases of harassment, suicides, and defaults worldwide that are directly or indirectly related to the behaviours of employees of microfinance institutions [48].

The economic impact is another essential dimension of Borrowers’ satisfaction with microfinance. Economic impact comprises three items: Increase income, save money, and pay the due payment. The primary objective of MFIs is to increase borrowers’ income through

microfinancing and make them able to save money for preventive use [47] [49]. Income is the only factor that describes a person's economic status, and access to income enables him to save money for precautionary demands. If the provided credit enables the borrowers to save access income for emergency use and easily manage the due payment. In that case, that will increase the degree of the serenity of poor borrowers.

It is also a complicated task to participate in social activities to fulfil children's education expenses and the family's health expenses for borrowers. These factors are part of another dimension of borrowers' satisfaction besides the product and services of Microfinance institutions. There is no doubt that when the product and services provided by the MFIs fulfil the desire of social factors described, they will satisfy the borrowers [50]. But a lot of research described that most borrowers cannot participate in social activities properly and cannot save enough money to cover their health and children's education expenses [51].

Finally, the borrower's satisfaction is momentarily associated with the socio-economics improvements. This dimension covers four important factors that contribute to a borrower's satisfaction regarding the outcomes of the loans from MFIs. Fulfillment of necessities, improvement in living standards, and economic improvement indicate that the borrower is getting away from the poverty line and is satisfied with the availed products and services of MFIs [4]. It is the prime desire of every human being to fulfill the basic requirements of life. Everyone wants to grow and improve their economic situation after obtaining the necessities. Economic improvement indicates the development of social and economic requirements as a whole.

## **Methodology**

### **Procedure for collection of information and analysis**

In order to meet the research objectives, a questionnaire has been prepared and information has been collected from the borrowers of 10 MFIs including one interest free microfinance institution (Akhawat Foundation) in low-profile district of Panjab, Pakistan. Questions were asked about all the socio-economic factors that are directly related to the borrower's satisfaction with the MFIs' product. Opinions have been taken from both men (about 62%) and women (about 38%) through a questionnaire. Assessment of Borrowers was divided into three categories, which are listed below:

1. Borrowers' perceptions about the intentions of MFIs
2. Borrower's satisfaction with the MFIs' available product and services
3. Borrower's satisfaction with the outcomes of MFIs' product and services

A Questionnaire were completed from 646 borrowers of 10 MFIs including 106 from one interest free MFI (Akhawat) and 540 borrowers of 9 MFIs, 60 from each. Borrowers' information was gathered when they came to pay their loan installments at the microfinance institutions on a predetermined day. Questionnaires were divided among them first, and they were educated on each section of the questionnaire before being asked to fill out their responses to each question. Borrowers provided feedback on ten factors under category 1, while categories 2 and 3 are further subdivided into five dimensions covering 17 factors regarding the borrower's satisfaction with the MFI's products and services.

### **Index system of MFI's products and services about Borrower's satisfaction assessment**

The borrower's satisfaction index system is composed of target level, criteria level and index level. First target or objective level shows borrower 'satisfaction. Secondly, at the criterion level dimensions are described for borrowers' satisfaction in terms of the five-pronged factors in figure 1. Thirdly, the index level prescribes various indicators that actually determine borrower's satisfaction. The final form of the Borrower's Satisfaction Index System of MFI's product and services, the outcomes of utilizing loan is constructed in table 1 and further describe as follows.

*Product:* Loan as a product is the first step toward target level of borrowers' satisfaction. The amount of loan defines derived level of satisfaction because higher amount of loan becomes difficult to manage and lower amount of loan turns out to fulfil basic operational expenses [52]. The price of loan in term of interest rate is another factor of product which determines borrowers' satisfaction. As a higher interest rate discourages customer from availing this product while low interest rate play significant role in reducing poverty [53] and increase level of satisfaction. Similarly, fewer charges like services & transaction enhances borrower's ability to avail this credit facility.

*Services (Behavior of employee of MFI):* Firm, Organization or Institution behavior by employees toward customers plays a very important role, especially in the banking sector. Polite, motivational, encouraging, heartening and enhancing behavior from microfinance institutions impacts acknowledgement on borrowers. Inspiring behavior raises borrowers' comfort, pleasure and satisfaction and also enhances their ability to get the gladly available loan [53] of the MFIs. Borrower's satisfaction level can be measured by observing an aspect of behavior of MFIs through pre-lending check, post-lending monitoring.

*Economic impact:* After the disbursement of loan, the most important aspect for a borrower's satisfaction is economic impact which is designed with three factors like save money for emergency use, income level and ability to pay due payments. If the Borrowers become able to save some money for future and manage installment easily it will be satisfactory for him but it is only possible if he earns reasonable income. Therefore, these three factors are very important indicators to measure borrowers' satisfaction under the criteria level economic impact.

*Social impact:* Social impact is another important aspect for the measurement of borrowers' satisfaction. It also has three indicators from which a borrower can be energized by the provided loan of MFIs. If the loan quenches the borrower's health, educational and social activities expenses, that will raise the level of satisfaction otherwise not. Borrowers' responses were also recorded for these factors (health, children education and social embedded expenses) to measure borrower's satisfaction.

*Socio-economic improvement:* The final aspect of borrower satisfaction is socio-economic improvement, which is comprised of four factors: basic needs, living standards, poverty reduction, and economic improvement. The improvement of the described elements can be adequately defined by a borrower. The fulfilment of basic needs and better living conditions are the clear distinctions between satisfied and dissatisfied people. A man with an empty pocket is an image of poverty; no money, no economic activity. However, if MFI facilities affect borrowers' lives, it will manifest itself in the form of socioeconomic improvement.

### **Fuzzy comprehensive evaluation system**

It is a logical tool to measure vagueness and qualms in human assessment[54]. It also delivers



a cohesive basis that combines the ambiguous finding from numerous categories of purposed factors that were needed comprehensive evaluation. The fuzzy comprehensive evaluation method is a technique that uses fuzzy mathematics to solve the complex and ambiguous behavioral qualitative problem. Fuzzy mathematics utilizes the set theory of mathematic in which the fuzzy comprehensive index system has been created. Such index system has been measurable and comparable. It also possesses human assessment and human factor filtration. Fuzzy comprehensive evaluation index system is developed in table 1.

In comprehensive evaluation of borrower satisfaction, employing a system comprised of multiple individual indicators that can be viewed as a comprehensive approach which is highly recommended [52]. The study intends to make use of Fuzzy logic is used because it ensures the accuracy, viability, and sustainability [55] of Borrower satisfaction evaluations with microfinance by incorporating expert opinion [55]. Borrower satisfaction is associated with multiple quantitative and qualitative factor whose evaluation needed several steps and phases. Borrowers' satisfaction derived directly from the product and services first then impact of MFIs' product indirectly generate different level of satisfaction for borrowers. FCEM is best fit to evaluate such fragmented borrower satisfaction because it works properly [56], result in fewer delays, less duplication of effort and accurate customer satisfaction [57]. The comprehensive evaluation system phases and selected indicators are used to assess borrowers' satisfaction construct our evaluation index system. Fragmented Borrowers' satisfaction and fuzzy evaluation system best describe in the figure 1

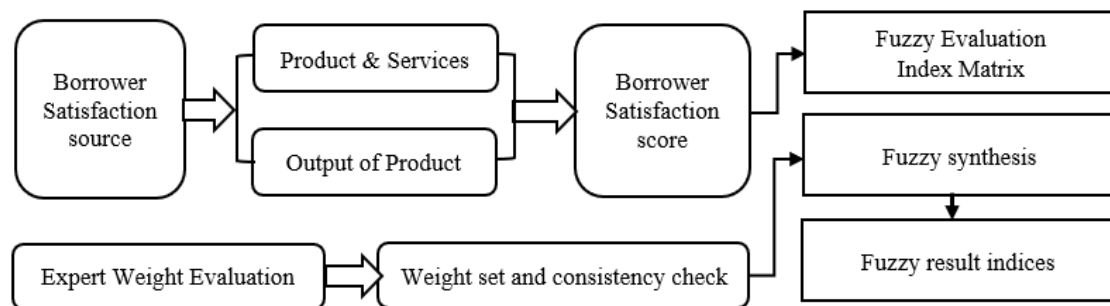


Figure 2 Borrowers' satisfaction evaluation Flow chart

Table 1 Borrowers' satisfaction evaluation index system of MFI's Loan

| Target Level                        | Criteria Level  | Index level  |
|-------------------------------------|---|--|
| Borrowers' satisfaction             | U <sub>1</sub> : Product                                  | X <sub>11</sub> : Offered Loan amount              |
|                                     |   | X <sub>12</sub> : Rate of Interest                 |
|                                     |   | X <sub>13</sub> : Charges (transaction, Services)  |
|                                     | U <sub>2</sub> : Services (Behavior of employees of MFIs) | X <sub>21</sub> : Access to loan                   |
|                                     |   | X <sub>22</sub> : MFIs behavior before lending     |
|                                     |   | X <sub>23</sub> : MFIs behavior after lending      |
|                                     |   | X <sub>24</sub> : Recovery behavior                |
|                                     | U <sub>3</sub> : Economic impact                          | X <sub>31</sub> : Increase in saving               |
|                                     |   | X <sub>32</sub> : Increase in income               |
|                                     |   | X <sub>33</sub> : Installment payment              |
|                                     | U <sub>4</sub> : Social impact                            | X <sub>41</sub> : Participate in social activities |
|                                     |   | X <sub>42</sub> : Education expenses of children   |
|                                     |   | X <sub>43</sub> : Health expenses                  |
|                                     | U <sub>5</sub> : Socio-economic improvements              | X <sub>51</sub> : Improve in basic necessities     |
|                                     |   | X <sub>52</sub> : Improve in living Standard       |
| X <sub>53</sub> : Poverty Reduction |   |  |

**Factor Set**

First step of fuzzy index system is to define first level factor set about overall evaluation required. This set is named as U and possible factor denoted by  $u_1, u_2, \dots, u_n$ . So, factor set for evaluation index system is defined as follows:

$$U = \{u_1, u_2, u_3, \dots, u_n\} \dots \dots \dots (1)$$

**Evaluation or Comment Set**

The second step of fuzzy evaluation system is to determine the comments set or define human judgment degrees of perceived factors. Such an evaluation set is named as V and is denoted by  $v_1, v_2, \dots, v_m$  as a degree of evaluation. So, the comment set described below and in the table 2 as well.

$$V = \{v_1, v_2, v_3, \dots, v_m\} \dots \dots \dots (2)$$

**Table 2** Evaluation set of satisfaction level

| Evaluation Item | Evaluation Quality | Evaluation Value |
|-----------------|--------------------|------------------|
| V <sub>1</sub>  | Very unsatisfied   | ≤ 0.2            |
| V <sub>2</sub>  | Unsatisfied        | >0.2 to ≤ 0.4    |
| V <sub>3</sub>  | Neutral            | >0.4 to ≤ 0.6    |
| V <sub>4</sub>  | Satisfied          | >0.6 to ≤ 0.8    |
| V <sub>5</sub>  | Very satisfied     | >0.8 to ≤ 1      |

**Evaluation Matrix**

Third step is to construct evaluation matrix R of (n x m). The elements of the matrix are denoted by  $r_{ij}$  where  $i=1,2,3,\dots, n$  represents number of factors belong to vector of factor set  $u_i$  and  $j=1,2,3,\dots, m$  represents number of degrees of single evaluation factor belong to vector of  $v_j$ . Evaluation matrix R is as followed.

$$R = (r_{ij})_{n \times m} = \begin{bmatrix} r_{11} & r_{12} & \dots & \dots & \dots & r_{1m} \\ r_{21} & r_{22} & \dots & \dots & \dots & r_{2m} \\ \cdot & \cdot & \dots & \dots & \dots & \cdot \\ \cdot & \cdot & \dots & \dots & \dots & \cdot \\ r_{n1} & r_{n2} & \dots & \dots & \dots & r_{nm} \end{bmatrix} \dots \dots \dots (3)$$

**Determining weight set:**

A researcher can adopt several ways of determining a weight set for the criteria level and for the index level, such as questionnaire or survey method [58], the mathematical or statistical formula method, expert opinion [59] [60], the combined weight method [61] and the analytical hierarchy process. This paper determines the weight of the factors with AHP due to its objectivity.

*Analytical Hierarchy Process:* It is a very comprehensive technique to evaluate complex decision with the combination of behavioral and factual information. Researchers often use this method to determine weight and to judge for multiple criteria. AHP also provides consistency of judgment, priority between criteria and alternative, and factor preferences through pairwise comparison. Prof. Thomas L. Saaty introduced this method in 1977. The AHP adopts several steps to construct a weight matrix for each level of indices. First of all, factors are aligned

hierarchically into the row and column. Then pairwise comparison matrix is constructed for each level of criteria, like for the first level of factor set  $U = \{u_1, u_2, \dots, u_n\}$ , pairwise comparison Matrix A can be constructed as follows.

$$A = (u_{ij})_{n \times n} = \begin{bmatrix} u_{11} & u_{12} & \dots & u_{1n} \\ u_{21} & u_{22} & \dots & u_{2n} \\ \cdot & \cdot & \dots & \cdot \\ u_{n1} & u_{n2} & \dots & u_{nn} \end{bmatrix} \dots \dots \dots (4)$$

Where  $u_{ij}$  represents factor i over factor j's relative importance. In fact, this  $u_{ij}$  is a relative importance of factor i over factor j, which is assigned according to rules defined by the Saaty's 1-9 lineal scale of preferences. The element  $u_{ij}$  of pairwise comparison matrix can be generalized as follows:

- $u_{ij} = u_i/u_j > 1$  when  $u_i$  is more important than  $u_j$
- $u_{ij} = u_i/u_j = 1$  when  $u_i = u_j$  equal importance
- $u_{ij} = u_i/u_j < 1$  when  $u_i$  is less important than  $u_j$

Further prescribed rules for pairwise comparison matrix are arranged with the numerical values in the table 3.

**Table 3.** Number scale and its description

| Scale          | Compare factor i and j               |
|----------------|--------------------------------------|
| 1              | Equal importance                     |
| 3              | Moderate importance                  |
| 5              | Essential or strong importance       |
| 7              | Very strong importance               |
| 9              | Extreme importance                   |
| 2, 4, 6, and 8 | Intermediate value of the comparison |

The corresponding weight for each factor can be calculated with the help of judgment of pairwise comparison matrix. For this purpose, weight vector needs to construct by using simple method of average of normalized column (ANC). The formula for ANC given as follows

$$w_i = \frac{1}{n} \sum_{j=1}^n \frac{u_{ij}}{\sum_{i=1}^n u_{ij}} \quad (i, j = 1, 2, \dots, n) \dots \dots \dots (5)$$

Thus, generally weight vector described as

$$W = \{w_1, w_2, w_3, \dots, \dots, w_n\} \dots \dots \dots (6)$$

It is mandatory to check consistency for pairwise comparison matrix. It needs to calculate consistency ratio which can be obtained by using the following formula.

$$CR = CI/RI \dots \dots \dots (7)$$

where CR stands for Consistency Ratio, CI is consistency index obtained by as follows.

$$CI = (\lambda - n)/(n-1) \dots \dots \dots (8)$$

where  $\lambda$  is the total value of the consistency vector while the consistency vector is the product of the total of pairwise comparison vector of each factor with the inverse of weight vector W. It turns out that if and only if  $\lambda$  equals the number of factors of the judgment matrix then matrix A will be most consistent. Usually, the value of  $\lambda$  is greater than n (the number of the factors of the judgment matrix) but as well as it approaches to n then the value of the consistency ratio

approaches to zero, it means it travels toward consistency of the judgment matrix. RI is average random consistency index that can be taken from table 4 of random index. If the value of consistency ratio is less than 0.1 ( $Cr < 0.1$ ) then the judgment value of the pairwise matrix will be consistent and reliable, otherwise not.

Table 4. Random Consistency Index

| n  | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    |
|----|------|------|------|------|------|------|------|------|------|
| RI | 0.00 | 0.00 | 0.58 | 0.90 | 1.12 | 1.24 | 1.32 | 1.41 | 1.45 |

### Comprehensive evaluation Result set.

A fuzzy Comprehensive evaluation result set for factor or index level, criteria level and target level can be evaluated in the final step of fuzzy compressive evaluation by applying fuzzy mathematical operation on the weight set of the prescribed each level with corresponding comments evaluation matrix for each level. First of all, the fuzzy matrix  $B_i$  of the index level which is composed of the AHP weight of the index level and the score of the evaluation set of the index level, gives us useful information about each criterion level. Each factor can be evaluated separately and gives us a level of borrower's satisfaction for each factor. Similarly, the result vector for criteria level leads to describing overall borrowers' satisfaction which is composed of the AHP weight of the criteria level and the result matrix of the factor level. Generally, the comprehensive evaluation set is expressed as follows.

$$B_i = W_i \times R_{ij} = [W_1, W_2, W_3, W_4, W_5] \times \begin{bmatrix} r_{11} & r_{12} & \dots & \dots & r_{1m} \\ r_{21} & r_{22} & \dots & \dots & r_{2m} \\ \cdot & \cdot & \dots & \dots & \cdot \\ \cdot & \cdot & \dots & \dots & \cdot \\ r_{n1} & r_{n2} & \dots & \dots & r_{nm} \end{bmatrix} = \{b_1, b_2, b_3, \dots, \dots, b_n\} \dots \dots \dots (9)$$

### Empirical results

#### Summary statistics of descriptive analysis

Majority of the borrowers belong to older age group and borrowers' average household size is six persons while average employed person of the household is one. Only 7 % of 38% women borrower were utilizing loan amount herself, 93% husbands of women borrower were taken loan amount from their wives while 62% male borrower uses loan amount themselves. Collected information has been taken from the borrowers who have been using MFIs facilities at least for last one year. Overall, the borrowers are taking facilities ranging from 1 to 3 years while average duration of the loan utilizing is about 1 year and 10 months.

Basic information of Borrowers is summarized in table 5. The majority of the borrowers were illiterate [53] or below the primary level of education. Unfortunately, none of the borrowers go to college, only 7% of the borrowers have a higher secondary school level of education and 93% of the borrowers in the sample possess a middle-level education or below. Average monthly household income and expenses are about Rs.14500 and Rs 16000 respectively. This average difference of Rs.1500 access expenses, the borrowers fulfil from MFI borrowing Majority of the borrowers' household income (46%) come from daily wages, 14% household earn from agriculture cropping and 6% from livestock while only 18 % and 16% household collect their income from services shop and small shop respectively. Some interesting information discloses the difference between the purpose of borrowing and utilization of the loan. Actually, MFI disburses loan to the borrowers for some specific investment or business' purpose. According to collected information 27% respondents (borrowers) spent the loan for Agriculture cropping, 20% for Livestock, 22% for small shop including services, 6% for small

industry and 25% for new business. On contrary, 17% borrowers reported that they use to pay informal credit, 19% utilized in house construction or repairing, 22% have health emergencies, 21% need to spend on their children's marriages while 21% use to meet their Precautionary demands. able 5 describes summary statistics of the same information for Akhowat microfinance foundation and remaining institutions separately in column 5 to 8. There are minute differences in the percentage values of responses of borrowers of interest-free microfinance institutions (Akhawat microfinance) and remaining all microfinance institutions collectively.

Table 5 Summary statistics of Microfinance borrowers

| Source   | Categories                    | Banks |    |         |    |           |    |
|--|-------------------------------|-------|----|---------|----|-----------|----|
|  |                               | All   |    | Akhawat |    | Remaining |    |
|  |                               | Value | %  | Value   | %  | Value     | %  |
| Borrowers' Household size                      |                               | 6.4   |    | 6.55    |    | 6.3       |    |
| Borrowers' employed Household size             |                               | 1.3   |    | 1.3     |    | 1.3       |    |
| Borrowers' duration of loan utilizing in month |                               | 22.3  |    | 23.3    |    | 22.1      |    |
| Gender   | Male                          | 245   | 62 | 48      | 45 | 200       | 37 |
|  | Female                        | 401   | 38 | 58      | 55 | 340       | 63 |
| Borrower Age in Years                          | 27-36                         | 017   | 03 | 03      | 03 | 014       | 03 |
|  | 37-46                         | 119   | 18 | 19      | 18 | 100       | 18 |
|  | 47-56                         | 244   | 38 | 39      | 37 | 205       | 38 |
|  | >56                           | 266   | 41 | 45      | 42 | 221       | 41 |
| Borrower Education                             | Illiterate                    | 370   | 57 | 59      | 56 | 311       | 58 |
|  | Middle                        | 231   | 36 | 39      | 37 | 192       | 35 |
|  | High secondary School Level   | 045   | 07 | 08      | 07 | 037       | 07 |
| Loan utilizing Person                          | Borrower's spouse             | 228   | 35 | 46      | 43 | 182       | 34 |
|  | Female                        | 018   | 03 | 03      | 03 | 015       | 03 |
|  | Male                          | 400   | 62 | 57      | 54 | 343       | 63 |
| Borrower Household Income                      | <8001                         | 352   | 55 | 58      | 54 | 292       | 54 |
|  | 8001-16000                    | 285   | 44 | 44      | 42 | 240       | 44 |
|  | 16001-24000                   | 009   | 01 | 04      | 04 | 008       | 02 |
| Borrower Household Expenses                    | <8001                         | 238   | 37 | 44      | 42 | 194       | 36 |
|  | 8001-16000                    | 330   | 51 | 50      | 47 | 280       | 52 |
|  | 16001-24000                   | 078   | 12 | 12      | 11 | 066       | 12 |
| Borrower Source of income                      | Agriculture cropping          | 089   | 14 | 17      | 16 | 072       | 13 |
|  | Daily wages                   | 300   | 46 | 44      | 42 | 256       | 47 |
|  | livestock                     | 039   | 06 | 07      | 06 | 032       | 06 |
|  | Services shop                 | 114   | 18 | 20      | 19 | 094       | 17 |
|  | Small shop                    | 104   | 16 | 18      | 17 | 086       | 16 |
| Purpose of borrowing                           | Agriculture Cropping          | 170   | 27 | 20      | 19 | 143       | 27 |
|  | Livestock                     | 130   | 20 | 31      | 29 | 110       | 20 |
|  | Small shop including services | 143   | 22 | 24      | 23 | 121       | 22 |
|  | Small industry                | 038   | 06 | 16      | 15 | 020       | 04 |
|  | New business                  | 161   | 25 | 15      | 14 | 146       | 27 |
| Actually, loan utilized for                    | Credit                        | 111   | 17 | 18      | 17 | 093       | 17 |
|  | Housing                       | 123   | 19 | 19      | 18 | 104       | 19 |
|  | Marriage                      | 137   | 21 | 22      | 21 | 115       | 22 |
|  | Health                        | 138   | 22 | 23      | 22 | 115       | 22 |
|  | Precautionary demands         | 137   | 21 | 22      | 21 | 113       | 20 |

### Intentions of Microfinance institution

Borrowers also give their assessment about the intention of microfinance institution and their staff. All possible questions were listed on the vertical axis of bar chart in figure 3. Length of bar shows percentage score of Borrowers response. More than 50% borrowers were answered “No or Neutral” for the first five Questions while rest of the questions also scored more than 50% but here borrower judgment is “yes”. Interpretation of the following results are not sympathetic with the borrowers because those questions recorded result more than 50% as “No or Neutral” it depicted that MFIs have not concern with the borrower’s interest. On the other hand, those questions recorded scored more than 50% as “yes” it portrayed that MFIs have only trepidation about own benefits. Our findings strengthen the previous study.

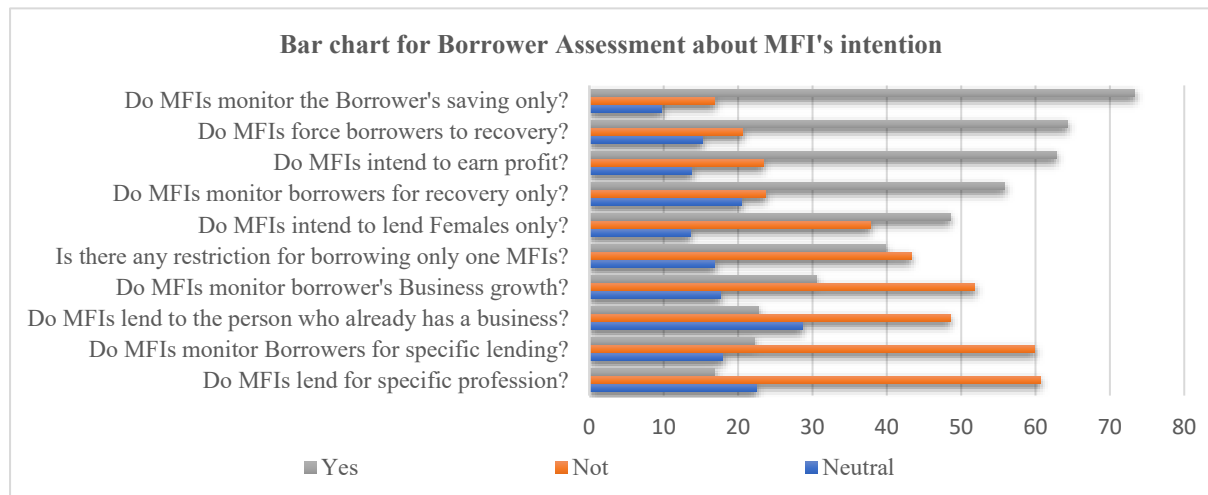


Figure 3. Borrower’s assessment about the intension of Microfinance institution

### Result for pairwise comparison matrix, weight and consistency check by AHP

Pairwise comparison human judgment matrix is constructed for factor level (table 6). The goal is to calculate weight for criterion level of borrowers’ satisfaction comprehensive evaluation. Relative importance of each factor is evaluated in table 6. Like factor Product(A) is 3 times more important than Service(B), 5 times more important than Economic impact (C), 7 times more important than Social Impact (D) and 8 times more important than Socio-Economic improvement (E). Further relative importance of remaining factors can be perceived in the table 6 row 2, 3, 4 and 5 below. Pairwise comparison matrix is the first step to calculate weight for each factor, pairwise comparison matrix is solved according to the procedure prescribed in the methodology. Consistency check found pairwise comparison matrix values are consistent and reliable for weight calculation. Sum of the values of weight vector is one, therefore weight vector is no longer needed to normalize the weight vector. Same procedure is adopted to calculate weight for index level of borrowers’ satisfaction evaluation system (see appendixes in table I to V).

Table 6. Pair wise comparison Matrix for criteria level, weight vector and consistency check

| Factor                | A     | B     | C     | D     | E     | $\sum \frac{u_{ij}}{\sum_{i=1}^n u_{ij}}$ | Weight<br>$= \frac{col.7}{n}$ |
|-----------------------|-------|-------|-------|-------|-------|---|-------------------------------|
| A                     | 1     | 3     | 5     | 7     | 8     |   |                               |
| B                     | 0.33  | 1     | 3     | 5     | 6     |   |                               |
| C                     | 0.20  | 0.33  | 1     | 3     | 4     |   |                               |
| D                     | 0.143 | 0.2   | 0.33  | 1     | 2     |   |                               |
| E                     | 0.125 | 0.167 | 0.25  | 0.5   | 1     |   |                               |
| $\sum_{i=1}^n u_{ij}$ | 1.798 | 4.697 | 9.58  | 16.5  | 21    |   |                               |
|                       | 0.556 | 0.639 | 0.522 | 0.424 | 0.381 | 2.522                                     | 0.504                         |

|  |       |       |       |       |       |                    |       |
|--|-------|-------|-------|-------|-------|--------------------|-------|
| $\frac{u_{ij}}{\sum_{i=1}^n u_{ij}}$   | 0.184 | 0.213 | 0.313 | 0.303 | 0.286 | 1.298              | 0.260 |
|  | 0.11  | 0.070 | 0.104 | 0.182 | 0.190 | 0.658              | 0.132 |
|  | 0.079 | 0.043 | 0.034 | 0.060 | 0.095 | 0.312              | 0.062 |
|  | 0.069 | 0.036 | 0.026 | 0.030 | 0.048 | 0.209              | 0.042 |
| Consistency Vector <sup>a</sup>  | 0.906 | 1.221 | 1.265 | 1.023 | 0.882 | 5.297 <sup>b</sup> |       |
| CI = $\lambda - n / n - 1$ , $\lambda = 5.297$ , $n = 5$ , $\lambda - n = 0.297$ , CI = 0.0742, RI = 1.12, CR = CI/RI = 0.0663, Cr < 0.1 |       |       |       |       |       |                    |       |
| A: Product; B: Service; C: Economic Impact; D: Social Impact; E: Socio-Economics Improvement   |       |       |       |       |       |                    |       |
| a. Product of the inverse of weight vector with sum of each factor vector of pairwise comparison matrix                                  |       |       |       |       |       |                    |       |
| b. Value of $\lambda$ is sum of the value of consistency vector  |       |       |       |       |       |                    |       |

## Result evaluation System of Borrowers' satisfaction of microfinance institution

Borrowers' satisfaction evaluation system comprises of multiple fragments like borrowers' assessment response, expert determination of weight and calculation by AHP, calculation of fuzzy comprehensive evaluation and interpretation of results. Data were collected through face-to-face questionnaire from borrowers. Questionnaire information is divided into three parts, first part includes basic information of borrowers, second part consists of borrowers' assessment about MFIs' intention and last part possesses assessment score of evaluation matrix (table 7) for each factor of index level. Listed score of borrower assessment in table 7 is collective information of microfinance institutions whereas separate data for interest free microfinance and remaining MFIs are listed in appendixes in VI and VII.

The weight is calculated by AHP method for criteria and index level of borrower's satisfaction evaluation system. Criteria level weights describe significance of each factor with each other (table 7 col. 3). Weight of each factor further elaborates the magnitude of relative importance of each factor. "Product" has highest importance and bear weight (0.504) while indicator "service" tolerates lower weight (0.260), other criterion places weight at lower rank. Similarly, index level of borrowers' satisfaction evaluation system also bear weight according to prescribed rules. Weight for index level listed in table 7 col. 6 and rank is listed in col.7.

Table 7. Evaluation System of borrower satisfaction, AHP weight vector for factor and index level

| Target Level            | Factor Level   | AHP Weight | AHP Rank | Criterion Level | AHP Weight | AHP Rank | Assessment Score |      |     |     |      |
|-------------------------|----------------|------------|----------|-----------------|------------|----------|------------------|------|-----|-----|------|
|                         |                |            |          |                 |            |          | VUS %            | US % | N % | S % | VS % |
| Borrower's satisfaction | U <sub>1</sub> | 0.504      | 1        | X <sub>11</sub> | 0.581      | 2        | 19               | 34   | 40  | 07  | 0    |
|                         |                |            |          | X <sub>12</sub> | 0.309      | 7        | 52               | 31   | 17  | 0   | 0    |
|                         |                |            |          | X <sub>13</sub> | 0.109      | 16       | 04               | 56   | 29  | 11  | 0    |
|                         | U <sub>2</sub> | 0.260      | 2        | X <sub>21</sub> | 0.322      | 6        | 0                | 19   | 40  | 38  | 03   |
|                         |                |            |          | X <sub>22</sub> | 0.255      | 10       | 0                | 13   | 28  | 39  | 20   |
|                         |                |            |          | X <sub>23</sub> | 0.223      | 12       | 21               | 30   | 33  | 16  | 0    |
|                         |                |            |          | X <sub>24</sub> | 0.199      | 13       | 17               | 43   | 30  | 10  | 0    |
|                         | U <sub>3</sub> | 0.132      | 3        | X <sub>31</sub> | 0.350      | 5        | 06               | 48   | 37  | 09  | 0    |
|                         |                |            |          | X <sub>32</sub> | 0.382      | 4        | 27               | 41   | 22  | 09  | 0    |
|                         |                |            |          | X <sub>33</sub> | 0.268      | 9        | 11               | 31   | 36  | 21  | 02   |
|                         | U <sub>4</sub> | 0.062      | 4        | X <sub>41</sub> | 0.069      | 17       | 17               | 32   | 24  | 19  | 08   |
|                         |                |            |          | X <sub>42</sub> | 0.250      | 11       | 08               | 19   | 35  | 22  | 15   |
|                         |                |            |          | X <sub>43</sub> | 0.681      | 1        | 08               | 24   | 37  | 19  | 11   |
|                         | U <sub>5</sub> | 0.042      | 5        | X <sub>51</sub> | 0.433      | 3        | 12               | 19   | 24  | 23  | 22   |
|                         |                |            |          | X <sub>52</sub> | 0.277      | 8        | 24               | 40   | 32  | 04  | 0    |
| X <sub>53</sub>         |                |            |          | 0.177           | 14         | 24       | 42               | 27   | 07  | 0   |      |

|   |  |  |  |                 |       |    |    |    |    |    |   |
|---|--|--|--|-----------------|-------|----|----|----|----|----|---|
|   |  |  |  | X <sub>54</sub> | 0.113 | 15 | 21 | 42 | 28 | 08 | 0 |
| Source: Author's expansion  |  |  |  |                 |       |    |    |    |    |    |   |
| U <sub>1</sub> : Product; U <sub>2</sub> : Service; U <sub>3</sub> : Economics Impact; U <sub>4</sub> : Social Impact; U <sub>5</sub> : Socio Economics Improvement |  |  |  |                 |       |    |    |    |    |    |   |
| VUS: Very Unsatisfied; US: unsatisfied; N: Neutral; S: Satisfied; VS: very Satisfied  |  |  |  |                 |       |    |    |    |    |    |   |

### First Level Fuzzy comprehensive evaluation for borrowers' assessment at factor level

First level fuzzy comprehensive evaluation is quantified in third column of table 8 for all MFIs collectively, Akhowat Foundation MFI and remaining MFIs respectively. The fuzzy evaluation response matrix and corresponding weight vector given in table 7 produce result for evaluation vector B in table 8. Evaluation vectors B<sub>1</sub>, B<sub>2</sub>, B<sub>3</sub>, B<sub>4</sub>, and B<sub>5</sub> give us very useful information. The second item of vector B<sub>1</sub> is bigger one, second item of the evaluation vector corresponds to unsatisfied, so for the criteria level "Product" bears result unsatisfied. In other word we can interpret that Borrowers are not satisfied with the indexes (Amount of loan, Interest Rate of loan and transaction or services Charges) of criterion Product. However, criteria level service (Behavior of employees of MFIs) found to be Neutral because the indexes (Access to loan and MFI's employee behavior with borrowers before lending) assessed satisfactory by the borrower but indexes (MFI's employees' behavior with borrowers after lending and recovery in loan) assessed unsatisfactory by the borrower, therefor, collectively factor "Behavior of employees of MFIs" produce result neutral. The interpretation of vector B<sub>3</sub>, B<sub>4</sub>, and B<sub>5</sub> are summarized in col.4 table 8. Coincidentally, all MFIs results are identical with the Akhowat and remaining MFIs.

Table 8. Fuzzy comprehensive evaluation assessment matrix and interpretation

| Microfinance Institutions   | Evaluation Vector of factor | Evaluation matrix of evaluation vector<br>$B_i = W_i \times R_i$ | Borrowers' Assessment |
|---|-----------------------------|--|-----------------------|
| All   | U <sub>1</sub>              | B <sub>1</sub> = 0.2741, 0.3563, 0.3184, 0.0512, 0.0000          | Unsatisfied           |
|   | U <sub>2</sub>              | B <sub>2</sub> = 0.0801, 0.2468, 0.3326, 0.2802, 0.0603          | Neutral               |
|   | U <sub>3</sub>              | B <sub>3</sub> = 0.1540, 0.4082, 0.3097, 0.1222, 0.0059          | Unsatisfied           |
|   | U <sub>4</sub>              | B <sub>4</sub> = 0.0854, 0.2351, 0.3603, 0.1990, 0.1202          | Neutral               |
|   | U <sub>5</sub>              | B <sub>5</sub> = 0.1824, 0.3124, 0.2744, 0.1309, 0.0959          | Unsatisfied           |
| Akhowat   | U <sub>1</sub>              | B <sub>1</sub> = 0.2592, 0.3511, 0.3499, 0.0398, 0.0000          | Unsatisfied           |
|   | U <sub>2</sub>              | B <sub>2</sub> = 0.0834, 0.2368, 0.3281, 0.2759, 0.0759          | Neutral               |
|   | U <sub>3</sub>              | B <sub>3</sub> = 0.1385, 0.3916, 0.3469, 0.1204, 0.0026          | Unsatisfied           |
|   | U <sub>4</sub>              | B <sub>4</sub> = 0.0764, 0.2421, 0.3388, 0.3427, 0.0000          | Neutral               |
|   | U <sub>5</sub>              | B <sub>5</sub> = 0.1918, 0.3303, 0.2528, 0.2251, 0.0000          | Unsatisfied           |
| Remaining   | U <sub>1</sub>              | B <sub>1</sub> = 0.2770, 0.3573, 0.3123, 0.0534, 0.0000          | Unsatisfied           |
|   | U <sub>2</sub>              | B <sub>2</sub> = 0.0794, 0.2487, 0.3335, 0.2810, 0.0573          | Neutral               |
|   | U <sub>3</sub>              | B <sub>3</sub> = 0.1570, 0.4114, 0.3024, 0.1226, 0.0065          | Unsatisfied           |
|   | U <sub>4</sub>              | B <sub>4</sub> = 0.0872, 0.2337, 0.3645, 0.1708, 0.1438          | Neutral               |
|   | U <sub>5</sub>              | B <sub>5</sub> = 0.1806, 0.3137, 0.2786, 0.1124, 0.1147          | Unsatisfied           |
| Source: Author's expansion  |                             |  |                       |
| U <sub>1</sub> : Product; U <sub>2</sub> : Service; U <sub>3</sub> : Economics Impact; U <sub>4</sub> : Social Impact; U <sub>5</sub> : Socio Economics Improvement |                             |  |                       |

### The second Level Fuzzy comprehensive evaluation for borrower's satisfaction:

Second-level fuzzy comprehensive evaluation is the most important decision step for borrower's satisfaction, which describes average and concluding explanations about factor level. Here we are able to make an overall judgement of satisfied and unsatisfied borrowers of microfinance institutions about all factors. This judgement is calculated as follows:



$$B = W \times B_i \text{ or } B = W \times \{B_1, B_2, B_3, B_4, B_5\}$$

$B_i$  evaluated in table 8 column 3 for all microfinance institutions, Akhowat interest free microfinance and remaining all separately, while  $W$  weight vector of index level presented in table 7 column 3. Result vector for second level fuzzy comprehensive evaluation projected in table 9.

Table 9 Second and Finale level evaluation

| Microfinance institutions                            | $B = W \times B_i$                     | $S = B \times V$  |
|--|--|-------------------|
| All MFIs   | 0.3911, 0.4053, 0.2106, 0.0486, 0.0119 | 0.3860 or 38.60 % |
| Akhowat <sup>1</sup> MFI                             | 0.3776, 0.4035, 0.2134, 0.0622, 0.0033 | 0.3881 or 38.81%  |
| Except Akhowat                                       | 0.3937, 0.4069, 0.2100, 0.0459, 0.0135 | 0.3856 or 38.56 % |
| 1. Akhowat an interest free microfinance institution |  |                   |

The second level fuzzy evaluation is calculated in accordance with the result matrix of the first level fuzzy evaluation and produces vector  $B$ . The maximum value in the result vector  $B$  for all microfinance institutions is 0.4053, for Akhowat microfinance it is 0.4035 and for the remaining microfinance institutions it is 0.4069 in table 9 col.2. These maximum values of the result vector corresponding to the evaluation set (very unsatisfied, unsatisfied, neutral, satisfied, very satisfied) are projected as an unsatisfied result. This maximum number indicates that the maximum number of the respondents (borrowers) is unsatisfied with the products and services of microfinance institutions.

The final comprehensive evaluation " $S$ " of the borrower's assessment of microfinance institutions have been calculated by multiplying vector " $B$ " of the second level fuzzy comprehensive evaluation with the evaluation vector " $V$ " as in table 9 col.3. The final score of the fuzzy comprehensive evaluation for all MFI lies somewhere between 0.2 and 0.4. This value indicates that the level of satisfaction of the borrower is 0.3860, or 38.60%, which corresponds to unsatisfied (table 2). Similarly, the results of interest-free microfinance (0.3881) and remaining MFIs (0.3856) show that borrowers are unsatisfied with the products and services too. Microfinance institutions needed to revise their policies, redesign their products, and improve their services regarding lending to facilitate poor borrowers.

## Discussion

Borrowers' satisfaction with product and services of microfinance institution is seldom debated topic in the literature [42]. Present study was particularly equipped for borrower assessment and perception about microfinance institution. There are some similarities between the summary statistics of borrower information and previous studies, such as the fact that the majority of borrowers are illiterate [62] or have a lower level of education [53] [63], a significant portion of women's loans is controlled by their spouse [64], the monthly income level is also low [53][63], and the loan was not used for the intended purpose [26] [65]. However, in response of multiple question about the intentions of MFIs, borrowers percept that MFIs intend to earn profit only [66][67][62]. MFIs do not have any concern with the borrowers

interests because MFIs stop monitoring borrowers' business until monitoring of loan usage can improve performance of MFIs [43]. Microfinance clients are not satisfied with products and services of MFIs [68][69]. Results of the present study demonstrate that microfinance borrowers are not satisfied with products of microfinance because loan amount and cost of loan (interest rate and other charges) addressed same issues by numerous studies [70][46][71][24][72]. The services of microfinance institutions are also unsatisfactory for microfinance borrowers, as MFI employees become extremely harsh and abusive with the borrower after the loan has been disbursed [73][74]. Borrowers' economic and social life is very hard until thousands of borrowers all over the world utilizing loans but convincing evidence is still not found [66][75][27][76][17][68][77][4].

## **Conclusion**

Measuring the satisfaction level of MFI borrowers was the prime objective of this study, which adopted a comprehensive evaluation method. The borrower's intensity of satisfaction can be judged by the response of the borrower to unfussy statistics. Respondents have been utilizing MFI loan products for the last 1–3 years, but their average monthly household income is less than their average monthly expenditure. Furthermore, there is a flaw in the borrower's source of income, the purpose of the loan, and the loan's use of essential. Moreover, in this study, respondents also shared their experiences and assessed the intention of MFI. On the basis of the MFI borrower's judgment, we conclude that microfinance institutions do not have a concern with the customer or borrower's benefits. MFI employees only monitor borrowers for saving and loan recovery. They never ask about the purpose of borrowing or business growth. Simply, we can say that MFI intended to earn a profit only because the majority of respondents (borrowers) reported that MFI intended to reimburse their lending amount and interest amount.

A fuzzy comprehensive evaluation method is adopted in conjunction with the analytical hierarchy process for the borrower's satisfaction. In the literature, ignoring factors has been identified as being very important for the determination of borrower satisfaction. MFI's hard and soft services have five dimensions: (1) product, (2) services of employees of MFIs, (3) economic impact, (4) social impact, and (5) socio-economic improvement. These dimensions further comprise 17 items, which are undoubtedly associated with borrower satisfaction. Contemporary ailments of microfinance products and services are not satisfactory as a whole, even though interest-free microfinance foundations are also not performing nicely because the result of all the items in the 5 dimension is assessed as unsatisfactory.

The results show that different items or criteria of index level produce some mixed response. Average result of factor level "product" shows that borrowers are unsatisfied with the microfinance institutions but item of factor level like amount of loan is very unsatisfactory for borrowers because offered loan amount is bare. Except for interest-free MFI, interest rate is also very unsatisfactory for MFI borrower. Transaction and services charges are again unsatisfactory for the borrower because they make the loan costly for them. The index level of the second factor (Services of employees of MFIs) was evaluated as neutral because borrower responses were satisfactory for two items (Access to Loan and behavior of employees of MFI before approval) and dissatisfactory for other two items of this factor. It is a common practice of MFIs to adopt polite behavior and gives easy access to the customers who are willing to borrow but after the loan is released, they become strict and harsh with the customers. Criterion The economic impact is also unsatisfactory for borrowers because they do not earn enough income to save money. Even though it has become difficult for them to pay monthly installment of the loan. Borrowers' satisfaction is not significant for the indexes of social impact but

borrower is not satisfied regarding factor of socio-economic improvement. Most of the Borrower complain that it has become difficult to maintain their basic necessities and living standards. Borrowers 'dreams of economic improvement and escaping poverty become impossible. Microfinance institutions needed revising their polices, redesigning their product and improving their services regarding lending to facilitate poor borrower. Government should play their role for the betterment of poor borrower because microfinance institutions are not facilitating poor and just exploiting them, even though microfinance institutions have intention to concern their own benefits.

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## Questionnaire for Data Collection

### Borrowers' assessment analysis of microfinance effectiveness with fuzzy comprehensive evaluation method

It is a Ph.D. survey collecting information from poor borrower of MFIs. Purpose of questionnaire is to measure of effectiveness of microfinance institution and utilization of borrowing amount and MFIs intentions. It is assured that all collected information will keep confidential. I would be thanks for your participation.

|   |  |   |
|---|--|---|
| <b>1. Borrower's Gender</b><br><input type="radio"/> Male<br><input type="radio"/> Female | <b>2. Borrower's Age</b><br><input type="radio"/> 17-26<br><input type="radio"/> 27-36<br><input type="radio"/> 37-46<br><input type="radio"/> 47-56<br><input type="radio"/> 56 above | <b>3. Borrower's Education Level</b><br><input type="radio"/> Illiterate<br><input type="radio"/> Middle level<br><input type="radio"/> Higher & Secondary level<br><input type="radio"/> Graduate level<br><input type="radio"/> Post graduate and above |
|---|--|---|

|  |  |
|--|--|
| <b>4. Borrower's Household size</b>                        |  |
| <b>5. Borrower's employed Household size</b>               |  |
| <b>6. Borrower's duration of loan utilizing (in month)</b> |  |
| <b>7. Borrower utilize loan (self or spouse)</b>           |  |

|  |   |   |
|--|---|---|
| <b>8. Borrower HH Income</b><br><input type="radio"/> Less than Rs. 8000<br><input type="radio"/> Rs. 8001-16000<br><input type="radio"/> Rs. 16001-24000<br><input type="radio"/> Rs. 24001-32000<br><input type="radio"/> Above Rs.32000 | <b>9. Borrower HH Expenses</b><br><input type="radio"/> Less or equal Rs. 8000<br><input type="radio"/> Rs. 8001-16000<br><input type="radio"/> Rs. 16001-24000<br><input type="radio"/> Rs. 24001-32000<br><input type="radio"/> Above Rs. 32000 | <b>10. Use of Borrowing Amount</b><br><input type="radio"/> Agriculture cropping<br><input type="radio"/> Live stock<br><input type="radio"/> Small shop including services<br><input type="radio"/> Industrial small production<br><input type="radio"/> Other (consumption) |
|--|---|---|

| <b>11. Microfinance institutions intentions</b>                          | Yes | No | Neutral |
|--|-----|----|---------|
| Do MFIs lend for specific profession?                                    |     |    |         |
| Do MFIs monitor Borrowers for specific lending?                          |     |    |         |
| Do MFIs monitor borrowers for recovery only?                             |     |    |         |
| Do MFIs force borrowers to recovery?                                     |     |    |         |
| Do MFIs intend to earn profit?   |     |    |         |
| Do MFIs lend to the person already has a business?                       |     |    |         |
| Do MFIs intend to lend Females only?                                     |     |    |         |
| Do MFIs monitor the Borrower's saving only?                              |     |    |         |
| Do MFIs monitor borrower's Business growth?                              |     |    |         |
| Is there any restriction from MFIs to borrowing from more than one MFIs? |     |    |         |

| <b>12. Borrower's satisfaction with MFIs about....</b> | <b>Very satisfied</b> | <b>Satisfied</b> | <b>Neutral</b> | <b>Unsatisfied</b> | <b>Very unsatisfied</b> |
|--|-----------------------|------------------|----------------|--------------------|-------------------------|
| Offered Loan amount                                    |                       |                  |                |                    |                         |
| Rate of Interest                                       |                       |                  |                |                    |                         |
| Other Charges (transaction, Services etc.)             |                       |                  |                |                    |                         |
| Access to loan   |                       |                  |                |                    |                         |
| Services before lending Check                          |                       |                  |                |                    |                         |
| Services after approval of loan                        |                       |                  |                |                    |                         |
| Services During Loan Recovery                          |                       |                  |                |                    |                         |
| Able to save Money emergency use                       |                       |                  |                |                    |                         |
| Increase in income                                     |                       |                  |                |                    |                         |
| Installment payment                                    |                       |                  |                |                    |                         |
| Participate in Social activities                       |                       |                  |                |                    |                         |
| Education expenses of children                         |                       |                  |                |                    |                         |
| Health expenses  |                       |                  |                |                    |                         |
| Improve in basic necessities                           |                       |                  |                |                    |                         |
| Improve in living Standard                             |                       |                  |                |                    |                         |
| Poverty Reduction                                      |                       |                  |                |                    |                         |
| Economically improvement                               |                       |                  |                |                    |                         |

## Appendixes

Table I. Pair wise comparison Matrix for Product, weight vector and consistency check

| Factor   | A      | B      | C      | $\sum \frac{u_{ij}}{\sum_{i=1}^n u_{ij}}$ | Weight<br>= $\frac{col.5}{n}$ |
|--|--------|--------|--------|---|-------------------------------|
| A  | 1      | 2      | 5      |   |                               |
| B  | 0.5    | 1      | 3      |   |                               |
| C  | 0.2    | 0.33   | 1      |   |                               |
| $\sum_{i=1}^n u_{ij}$  | 1.7    | 3.33   | 9      |   |                               |
| $\frac{u_{ij}}{\sum_{i=1}^n u_{ij}}$   | 0.5882 | 0.6006 | 0.5556 | 1.7444                                    | 0.5815                        |
|  | 0.2941 | 0.3003 | 0.3333 | 0.9277                                    | 0.3093                        |
|  | 0.1176 | 0.0991 | 0.1111 | 0.3278                                    | 0.1093                        |
| Consistency Vector <sup>a</sup>  | 0.9885 | 1.0298 | 0.9836 | 3.0019 <sup>b</sup>                       |                               |
| CI = $\lambda - n / n - 1$ , $\lambda = 3.0019$ , $n = 3$ , $\lambda - n = 0.0019$ , CI = 0.0093, RI = 0.58, Cr = CI/RI = 0.0016, Cr < 0.1 |        |        |        |   |                               |
| A: loan amount; B: Interest charges; C: transaction and services charges   |        |        |        |   |                               |
| a. Product of the inverse of weight vector with sum of each factor vector of pairwise comparison matrix                                    |        |        |        |   |                               |
| b. Value of $\lambda$ is sum of the value of consistency vector  |        |        |        |   |                               |

Table II. Pair wise comparison Matrix for Services, weight vector and consistency check

| Factor   | A      | B       | C      | D      | $\sum \frac{u_{ij}}{\sum_{i=1}^n u_{ij}}$ | Weight<br>= $\frac{col.6}{n}$ |
|--|--------|---------|--------|--------|---|-------------------------------|
| A  | 1      | 1.25    | 1.35   | 1.75   |   |                               |
| B  | 0.8    | 1       | 1.25   | 1.15   |   |                               |
| C  | 0.74   | 0.8     | 1      | 1.15   |   |                               |
| D  | 0.57   | 0.87    | 0.87   | 1      |   |                               |
| $\sum_{i=1}^n u_{ij}$  | 3.11   | 3.92    | 4.47   | 5.05   |   |                               |
| $\frac{u_{ij}}{\sum_{i=1}^n u_{ij}}$   | 0.3215 | 0.3189  | 0.3013 | 0.3465 | 1.2890                                    | 0.3222                        |
|  | 0.2572 | 0.25511 | 0.2796 | 0.2277 | 1.0197                                    | 0.2549                        |
|  | 0.2379 | 0.2041  | 0.2237 | 0.2277 | 0.8935                                    | 0.2234                        |
|  | 0.183  | 0.2220  | 0.1946 | 0.198  | 0.7979                                    | 0.1994                        |
| Consistency Vector <sup>a</sup>  | 1.0014 | 0.9996  | 0.9968 | 1.0049 | 4.0028 <sup>b</sup>                       |                               |
| CI = $\lambda - n / n - 1$ , $\lambda = 4.0028$ , $n = 4$ , $\lambda - n = 0.0028$ , CI = 0.0093, RI = 0.9, Cr = CI/RI = 0.00103, Cr < 0.1 |        |         |        |        |   |                               |
| A: Access to loan; B: Services before lending; C: Services after lending; D: Recovery services   |        |         |        |        |   |                               |
| a. Product of the inverse of weight vector with sum of each factor vector of pairwise comparison matrix                                    |        |         |        |        |   |                               |
| b. Value of $\lambda$ is sum of the value of consistency vector  |        |         |        |        |   |                               |

Table III. Pair wise comparison Matrix for Economic impact, weight vector and consistency check

| Factor  | A      | B      | C      | $\sum \frac{u_{ij}}{\sum_{i=1}^n u_{ij}}$ | Weight<br>= $\frac{col.5}{n}$ |
|---|--------|--------|--------|---|-------------------------------|
| A   | 1      | 0.8    | 1.5    |   |                               |
| B   | 1.25   | 1      | 1.25   |   |                               |
| C   | 0.67   | 0.8    | 1      |   |                               |
| $\sum_{i=1}^n u_{ij}$   | 2.92   | 2.6    | 3.75   |   |                               |
| $\frac{u_{ij}}{\sum_{i=1}^n u_{ij}}$  | 0.3425 | 0.3077 | 0.4    | 1.050                                     | 0.3501                        |
|   | 0.4281 | 0.3846 | 0.3333 | 1.1460                                    | 0.3820                        |
|   | 0.2295 | 0.3077 | 0.2667 | 0.8038                                    | 0.2679                        |
| Consistency Vector <sup>a</sup>   | 1.022  | 0.988  | 1.0125 | 3.0225 <sup>b</sup>                       |                               |
| CI = $\lambda - n / n - 1$ , $\lambda = 3.0225$ , $n = 3$ , $\lambda - n = 0.0225$ , CI = 0.01125, RI = 0.58, Cr = CI/RI = 0.0194, Cr < 0.1 |        |        |        |   |                               |
| A: Increase Saving; B: Increase Income; C: Instalment of loan   |        |        |        |   |                               |
| a. Product of the inverse of weight vector with sum of each factor vector of pairwise comparison matrix                                     |        |        |        |   |                               |
| b. Value of $\lambda$ is sum of the value of consistency vector   |        |        |        |   |                               |

Table IV. Pair wise comparison Matrix for Social impact, weight vector and consistency check

| Factor  | A        | B        | C        | $\sum \frac{u_{ij}}{\sum_{i=1}^n u_{ij}}$ | Weight<br>= $\frac{col.5}{n}$ |
|---|----------|----------|----------|---|-------------------------------|
| A   | 1        | 0.25     | 0.11     |   |                               |
| B   | 4        | 1        | 0.33     |   |                               |
| C   | 9        | 3        | 1        |   |                               |
| $\sum_{i=1}^n u_{ij}$   | 14       | 4.25     | 1.44     |   |                               |
| $\frac{u_{ij}}{\sum_{i=1}^n u_{ij}}$  | 0.071429 | 0.058824 | 0.076389 | 0.206641                                  | 0.06888                       |
|   | 0.285714 | 0.235294 | 0.229167 | 0.750175                                  | 0.250058                      |
|   | 0.642857 | 0.705882 | 0.694444 | 2.043184                                  | 0.681061                      |
| Consistency Vector <sup>a</sup>   | 0.966    | 1.0625   | 0.9792   | 3.0077 <sup>b</sup>                       |                               |
| CI = $\lambda - n / n - 1$ , $\lambda = 3.0077$ , $n = 3$ , $\lambda - n = 0.0077$ , CI = 0.00385, RI = 0.58, Cr = CI/RI = 0.0065, Cr < 0.1 |          |          |          |   |                               |
| A: Participation in social embedded; B: Education expenses; C: Health expenses  |          |          |          |   |                               |
| a. Product of the inverse of weight vector with sum of each factor vector of pairwise comparison matrix                                     |          |          |          |   |                               |
| b. Value of $\lambda$ is sum of the value of consistency vector   |          |          |          |   |                               |

Table V. Pair wise comparison Matrix for socio Economics improvement, weight vector and consistency check

| Factor  | A      | B      | C      | D      | $\sum \frac{u_{ij}}{\sum_{i=1}^n u_{ij}}$ | Weight<br>= $\frac{col.6}{n}$ |
|---|--------|--------|--------|--------|---|-------------------------------|
| A   | 1      | 2      | 2.5    | 3      |   |                               |
| B   | 0.5    | 1      | 2      | 2.5    |   |                               |
| C   | 0.4    | 0.5    | 1      | 2      |   |                               |
| D   | 0.33   | 0.4    | 0.5    | 1      |   |                               |
| $\sum_{i=1}^n u_{ij}$   | 2.23   | 3.9    | 6      | 8.5    |   |                               |
| $\frac{u_{ij}}{\sum_{i=1}^n u_{ij}}$  | 0.4484 | 0.5128 | 0.4167 | 0.3529 | 1.7309                                    | 0.4327                        |
|   | 0.2242 | 0.2561 | 0.3333 | 0.2941 | 1.1081                                    | 0.2770                        |
|   | 0.1794 | 0.1282 | 0.1667 | 0.2353 | 0.7095                                    | 0.1774                        |
|   | 0.1480 | 0.1026 | 0.0833 | 0.1176 | 0.4515                                    | 0.1129                        |
| Consistency Vector <sup>a</sup>   | 0.9589 | 1.0803 | 1.062  | 0.935  | 4.0362 <sup>b</sup>                       |                               |
| CI = $\lambda - n / n - 1$ , $\lambda = 4.0362$ , $n = 4$ , $\lambda - n = 0.0362$ , CI = 0.0121, RI = 0.9, Cr = CI/RI = 0.0134, Cr < 0.1 |        |        |        |        |   |                               |
| A: Improve in basic necessities; B: Improve in living Standard; C: Poverty Reduction; D: Economically improvement                         |        |        |        |        |   |                               |
| a. Product of the inverse of weight vector with sum of each factor vector of pairwise comparison matrix                                   |        |        |        |        |   |                               |
| b. Value of $\lambda$ is sum of the value of consistency vector   |        |        |        |        |   |                               |

Table VI. Borrowers' assessment score of interest free MFIs and AHP weight vector for factor and index level

| Target Level            | Factor Level   | AHP Weight | AHP Rank | Criterion Level | AHP Weight | AHP Rank | Assessment Score |      |     |     |      |
|-------------------------|----------------|------------|----------|-----------------|------------|----------|------------------|------|-----|-----|------|
|                         |                |            |          |                 |            |          | VUS %            | US % | N % | S % | VS % |
| Borrower's satisfaction | U <sub>1</sub> | 0.504      | 1        | X <sub>11</sub> | 0.581      | 2        | 18               | 33   | 44  | 05  | 0    |
|                         |                |            |          | X <sub>12</sub> | 0.309      | 7        | 49               | 32   | 19  | 0   | 0    |
|                         |                |            |          | X <sub>13</sub> | 0.109      | 16       | 03               | 55   | 31  | 11  | 0    |
|                         | U <sub>2</sub> | 0.260      | 2        | X <sub>21</sub> | 0.322      | 6        | 0                | 16   | 43  | 37  | 04   |
|                         |                |            |          | X <sub>22</sub> | 0.255      | 10       | 0                | 13   | 26  | 36  | 25   |
|                         |                |            |          | X <sub>23</sub> | 0.223      | 12       | 21               | 29   | 27  | 23  | 0    |
|                         |                |            |          | X <sub>24</sub> | 0.199      | 13       | 19               | 43   | 30  | 08  | 0    |
|                         | U <sub>3</sub> | 0.132      | 3        | X <sub>31</sub> | 0.350      | 5        | 06               | 43   | 43  | 08  | 0    |
|                         |                |            |          | X <sub>32</sub> | 0.382      | 4        | 25               | 40   | 25  | 11  | 0    |
|                         |                |            |          | X <sub>33</sub> | 0.268      | 9        | 09               | 33   | 38  | 19  | 01   |
|                         | U <sub>4</sub> | 0.062      | 4        | X <sub>41</sub> | 0.069      | 17       | 12               | 38   | 22  | 28  | 0    |
|                         |                |            |          | X <sub>42</sub> | 0.250      | 11       | 07               | 17   | 40  | 37  | 0    |
|                         |                |            |          | X <sub>43</sub> | 0.681      | 1        | 08               | 25   | 33  | 34  | 0    |
|                         | U <sub>5</sub> | 0.042      | 5        | X <sub>51</sub> | 0.433      | 3        | 12               | 21   | 22  | 45  | 0    |
|                         |                |            |          | X <sub>52</sub> | 0.277      | 8        | 25               | 42   | 29  | 05  | 0    |
|                         |                |            |          | X <sub>53</sub> | 0.177      | 14       | 26               | 43   | 26  | 04  | 0    |
|                         |                |            |          | X <sub>54</sub> | 0.113      | 15       | 21               | 42   | 27  | 09  | 0    |

Source: Author's expansion  
 U<sub>1</sub>: Product; U<sub>2</sub>: Services; U<sub>3</sub>: Economics Impact; U<sub>4</sub>: Social Impact; U<sub>5</sub>: Socio Economics Improvement  
 VUS: Very Unsatisfied; US: unsatisfied; N: Neutral; S: Satisfied; VS: very Satisfied

Table VII. Borrowers' assessment score of Remaining all MFIs and AHP weight vector for factor and index level

| Target Level            | Factor Level   | AHP Weight | AHP Rank | Criterion Level | AHP Weight | AHP Rank | Assessment Score |      |     |     |      |
|-------------------------|----------------|------------|----------|-----------------|------------|----------|------------------|------|-----|-----|------|
|                         |                |            |          |                 |            |          | VUS %            | US % | N % | S % | VS % |
| Borrower's satisfaction | U <sub>1</sub> | 0.504      | 1        | X <sub>11</sub> | 0.581      | 2        | 19               | 35   | 39  | 07  | 0    |
|                         |                |            |          | X <sub>12</sub> | 0.309      | 7        | 52               | 31   | 17  | 0   | 0    |
|                         |                |            |          | X <sub>13</sub> | 0.109      | 16       | 04               | 56   | 28  | 11  | 0    |
|                         | U <sub>2</sub> | 0.260      | 2        | X <sub>21</sub> | 0.322      | 6        | 0                | 20   | 39  | 39  | 02   |
|                         |                |            |          | X <sub>22</sub> | 0.255      | 10       | 0                | 12   | 29  | 40  | 19   |
|                         |                |            |          | X <sub>23</sub> | 0.223      | 12       | 21               | 30   | 34  | 15  | 0    |
|                         |                |            |          | X <sub>24</sub> | 0.199      | 13       | 16               | 44   | 30  | 10  | 0    |
|                         | U <sub>3</sub> | 0.132      | 3        | X <sub>31</sub> | 0.350      | 5        | 06               | 49   | 35  | 09  | 0    |
|                         |                |            |          | X <sub>32</sub> | 0.382      | 4        | 28               | 41   | 22  | 09  | 0    |
|                         |                |            |          | X <sub>33</sub> | 0.268      | 9        | 11               | 30   | 35  | 21  | 02   |
|                         | U <sub>4</sub> | 0.062      | 4        | X <sub>41</sub> | 0.069      | 17       | 17               | 31   | 25  | 18  | 10   |
|                         |                |            |          | X <sub>42</sub> | 0.250      | 11       | 08               | 19   | 35  | 19  | 19   |
|                         |                |            |          | X <sub>43</sub> | 0.681      | 1        | 08               | 24   | 38  | 16  | 13   |
|                         | U <sub>5</sub> | 0.042      | 5        | X <sub>51</sub> | 0.433      | 3        | 12               | 19   | 25  | 18  | 27   |
|                         |                |            |          | X <sub>52</sub> | 0.277      | 8        | 23               | 39   | 33  | 04  | 0    |
|                         |                |            |          | X <sub>53</sub> | 0.177      | 14       | 23               | 42   | 27  | 07  | 0    |
|                         |                |            |          | X <sub>54</sub> | 0.113      | 15       | 21               | 42   | 29  | 08  | 0    |

Source: Author's expansion  
 U<sub>1</sub>: Product; U<sub>2</sub>: Services; U<sub>3</sub>: Economics Impact; U<sub>4</sub>: Social Impact; U<sub>5</sub>: Socio Economics Improvement  
 VUS: Very Unsatisfied; US: unsatisfied; N: Neutral; S: Satisfied; VS: very Satisfied