CHAPTER 2

Research Methodology

2.1: Statement of the Problem

Despite significant moves of the Government towards the inclusion of the financially excluded people of the country, the inherent characteristics of the region make it difficult to implement the inclusion models adopted elsewhere in the country. The region-wise functioning offices of commercial banks in North East India as at end of the quarter December 2021 is 4918 which is very less as compared to Northern (27,935), Eastern (26,561), Central (31,099), Western (23,577) and Southern (43,806) regions of the country (RBI, 2021a). In addition, North-East secured a CRISIL Inclusix score of 48.5 which is much below the national average of 58, however, with a score of 79.8, the South keeps being in the lead (CRISIL Inclusix report, 2018). Also all the North-Eastern states except Tripura and Sikkim feature in the bottom 10 of the CRISIL Inclusix score. This shows that remote areas with difficult terrain pose a challenge to financial inclusion, and due to high costs and economies of adverse scale, it would not be prudent for banks to establish brick-and-mortar branches in every village. The solution lies in developing low-cost banking models by leveraging technology to actualize the execution of financial inclusion. The commercial bank branches and Automated Teller Machines (ATMs) per 100000 population in North East is 8.1 and 11.9 respectively, which is below the national average (Ministry of Electronics & Information Technology, Government of India & Better Than Cash Alliance Report, 2022). Assam, being the largest state of the region holds a majority of the population and financial flow. As compared to the national average, the Rupay debit card penetration in Assam is higher, however, the credit card penetration is negligible (Ministry of Electronics & Information Technology, Government of India & Better Than Cash Alliance Report, 2022). As of September 2018, Assam accounted for 10.25 million internet users (TRAI, 2018) which has now increased to 16.11 million as of September, 2021 (TRAI, 2021b). However, as of September 2021, there are 34.35 million wireless subscribers in Assam (TRAI, 2021b). In addition, Assam has been identified as one of the key contributors to the expansion of Paytm in India (BW online Bureau, 2018) and several other digital platforms have already been operating in Assam.

The current COVID-19 situation has immensely affected the informal sector stranded in different places in the country. Though, initiatives have been undertaken to provide the vulnerable section with financial assistance through direct benefit transfer many have not been able to benefit from such initiatives since they lack a bank account or are unaware of any such schemes. Furthermore, the implementation of financial inclusion measures has created numerous opportunities for evaluative study. A review of existing literature demonstrates that there is an anomaly in the overall strategy for increasing the regular use of formal financial services, particularly among the last-mile population. Thus, sustainability is an important issue that needs to be studied, the second issue is determining the determinants that affect the sustainability of financial inclusion. More so, FinTech's potential for fostering sustainable financial inclusion has not been studied extensively. India being a large user base in mobile phone penetration Fintech-based innovations could be used in attaining sustainable financial inclusion. The swift response of FinTech in providing with innovative services including the distribution of Government payments in various countries has made it well-positioned in meeting the financial needs of the population and aid in revolutionising the manner of delivery of financial services aftermath of the crisis. It prescribes the reconceptualization of existing financial services with technology-based approaches to meet the needs of the vulnerable. However, in attaining this many factors have to be considered such as, how much faith do the customers have in technology-based financial services. What is the level of acceptability among customers including the supply side challenges together with connectivity issues? Under the background of the above matters, an in-depth study is indeed of relevance to provide a probable solution in achieving greater financial inclusion in the region.

2.2 Objectives

1. To study the issues and determinants of sustainability of financial inclusion with reference to India.
2. To determine the factors affecting sustainability of financial inclusion in the area of the study.
3. To study the growth of FinTech services in India with special focus on interface with financial inclusion.
4. To examine the factors that impact the adoption or denial in using FinTech services.

5. To determine the factors that impact the supply of FinTech services for fostering financial inclusion.

6. To bring out a suggestive framework in furtherance of sustainability in financial inclusion with reference to Assam.

2.3 Research Questions

With the purpose of achieving the aforementioned research objectives, the following research questions have been identified

1) Are the accounts of most of the respondents in the area of the study operational?
2) If not, what are the determinants that are affecting their sustainability?
3) What are the motives of the respondents in opening bank accounts?
4) What are the problems that bank customers in the area of the study face in performing their financial transactions at formal financial institutions?
5) What is the awareness of the bank customers about the Fintech services?
6) What are the payment methods used by the bank customers?
7) What is the perception of the customers towards FinTech services?
8) What are the benefits that the users of FinTech services have experienced?
9) Do the bank customers feel that the services are affordable and are actively used by them?
10) What specific benefit and risk factor influence FinTech adoption?
11) What are the factors that will promote the last mile population to adopt FinTech services?
12) What is the level of the partnership of the FinTech service providers with mobile network operators?
13) What is the size of their agent network?
14) What are the determining factors for the incorporation of digital banking products for financial inclusion?
15) What are the technical factors that are affecting the FinTech service providers in providing their services in North East India?
16) What are the regulatory and cost issues that the companies face while performing their functions?

2.4: Research Methodology:

For the purpose of the study, each objective requires certain information desired to arrive at the conclusion. Most of the information has been collected as self-reported data through a survey.

Objective 1 deals with the theoretical framework regarding the sustainability of financial inclusion in India.

For objective 2 information about the level of operational accounts of the respondents both in rural and urban areas of Assam has been collected. The frequency in determining whether the accounts are active or not is measured in terms of RBI guidelines. The respondents were questioned about whether they are actively using their accounts and also the hindrances and motivations in maintaining accounts at formal financial institutions. Here, the data have been collected from the prime earner of the households. The variables that are considered for the study are tabulated in Annexure A

Objective 3 deals with national work done using FinTech in promoting financial inclusion, policy perspectives and their critical evaluation based on secondary information.

Objective 4 is fulfilled by using the Technology Acceptance Model put forward by Davis (1989) and its extended version known as TAM 2. Some additional constructs have also been taken based on the literature survey, considered relevant for technology adoption both in the rural and urban contexts. The variables considered for the study are tabulated in Annexure B.

For fulfilling objective 5, interview questions were asked to the functionaries of the FinTech service providers working for fostering financial inclusion. The variables that are considered for the study are tabulated in Annexure C.

Objective 6 deals with providing a technology-based suggestive framework based on the demand and supply side gap, providing a cornerstone regarding cost, regulation, policy involvement and the manner of involvement of different departments to achieve sustainable financial inclusion with the use of technology.

For the fulfilment of the above objectives, the detailed methodology is as follows:

2.4.1 Research Design

2.4.1a: Research Type: The research is empirical and descriptive in nature.

Both quantitative and qualitative methods were used for the study. Primary data have been collected to fulfil objectives 2, 4 and 5 whereas secondary data have been collected to fulfil objectives 1 and 3. For the demand side, data were collected from prime earner of the households both in the rural and urban areas of Kamrup, Darrang, Dhubri and Tinsukia districts. For the supply side, data were collected from the heads of the FinTech service providers/their representatives at the regional and zonal offices situated in Assam.

2.4.2 Data Collection Method

Table 2.1: Data collection method:

Objectives	Method	Sampling Unit	Sampling Element
2 and 4	Survey with structured interview schedule	Urban and rural households	Prime earner of the household
5	Survey with structured interview questionnaire	Functionaries of FinTech service providers	Executives/their representatives

2.4.3 Sampling method: The sampling method for objectives 2 and 4 (demand side) is multi-stage sampling. The stages of multistage sampling are as follows

Stage 1: District sampling- For this, the districts of Assam are divided into 4 categories using the CRISIL Inclusix score given for different districts. CRISIL Inclusix is India's first financial inclusix index, having been introduced in 2013 and supported by the Reserve Bank of India, the Microfinance Institution Network, the Pension Fund Regulatory and Development Authority, and the Insurance Information Bureau of India. The CRISIL Inclusix evaluates three service providers (banks, insurers, and microfinance institutions) on four dimensions: branch, deposit, credit and most recently, insurance. CRISIL Inclusix is measured on a scale from 0 to 100, with a maximal score of 100 being possible. CRISIL has categorised the index into (district, state, and regional) sections in order to provide a

comparative evaluation. As a benchmark, the CRISIL Inclusix score for India as a whole (50.1 in 2013) has been used.

CRISIL Inclusix score	Level of financial inclusion
>65.0	High
Between 50.1 – 65.0	Above average
Between 35.0 – 50.0	Below average
< 35.0	Low

Source: CRISIL Report (2018)

Table 2.2: CRISIL Inclusix score, literacy rate and multi-dimensional poverty index for different districts of Assam.

The data regarding West Karbi Anglong, Charaideo, Majuli, South Salmara Mankachar, Hojai and Biswanath Chariali is not available. So, these districts are not considered. The data for the remaining 27 districts are as follows

Districts	CRISIL Inclusix Score	Slab	Literacy rate	Multi-dimensional poverty index
Kamrup Metro	91.8	**High**	88.7%	2.63
Jorhat	75.4		82.1%	4.69
Dibrugarh	69.0		76%	7.30
Kamrup	**65.5**		**75.7%**	**11.70**
Sibsagar	62.8	**Above average**	80.4%	4.69
Nalbari	62.1		78.6%	7.89
Golaghat	58.6		77.4%	9.08
Tinsukia	**54.4**		**69.7%**	**13.13**
Bongaigaon	53.1		69.7%	12.71
Cachar	48.9	**Below average**	79.3%	17.10
Lakhimpur	48.4		77.2%	9.01
Sonitpur	48.4		67.3%	15.05

North Cachar Hills	45.5		77.5%	12.45
Darrang	**44.1**		**63.1%**	**21.79**
Karbi Anglong	43.8		69.3%	12.52
Barpeta	43.2		63.8%	11.08
Morigaon	40.6		68%	12.80
Nagaon	39.7		72.4%	12.18
Hailakandi	36.5		74.3%	17.68
Dhemaji	35.8		72.7%	9.25
Karimganj	34.8	**Low**	78.2%	18.73
Goalpara	32.6		67.4%	14.50
Kokrajhar	31.7		65.2%	9.97
Udalguri	30.7		65.4%	17.45
Chirang	30.1		69.7%	11.12
Dhubri	**28.4**		**58.3%**	**20.10**
Baksa	24.0		69.2%	13.6

Source: CRISIL Inclusix Report (2018); Census, Government of India (2011) and Government of Assam. NITI Aayog, UNDP, Assam Human Development Report (2014)

CRISIL's dimensions and parameters for measuring financial inclusion are branch penetration i.e., the number of branches per hundred thousand people in a district. Credit penetration, i.e., the number of loan accounts per hundred thousand of population and the number of microfinance loans per hundred thousand of population in a district, deposit penetration, i.e., the number of deposit accounts per hundred thousand of population, and insurance penetration, i.e., the number of insurance policies per hundred thousand of the population in a district. The data on literacy rate is obtained from Census 2011 statistical handbook for each district. The data on multi-dimensional poverty is derived from Assam Human Development Report, 2014, which is the second human development report, the first one was published in the year 2003. The OKD Institute of Social Change and Development, Guwahati, in collaboration with the Institute of Human Development, New Delhi, and under the auspices of the Planning and Development Department of the Assam Government, prepared the report. The multidimensional poverty index utilises health, education, and standard of living indicators to measure the level of poverty a

population experiences. Based on the above table, one district from each slab having the lowest literacy rate and highest multi-dimensional poverty index is selected for the study. Thus, the districts selected are Kamrup, Tinsukia, Darrang and Dhubri.

Stage 2: Ward and community development block sampling

Table 2.3: For rural area

District	Total no. of community development blocks in each district	Selected 10% of the blocks (rounded off to the greater whole number)
Kamrup	14	2
Tinsukia	7	1
Darrang	7	1
Dhubri	15	2

The blocks are selected using the random number generator. The names of the blocks collected from the Statistical Handbook of Kamrup, Tinsukia, Darrang and Dhubri districts from the Census, Government of India (2011) have been arranged alphabetically and numbers are put next to the names of the blocks. Then excel's RAND formula is used to generate the random numbers. Ten percent of the blocks from each district have been selected. The blocks that are less than 10 kilometres away from the main town are not included for the purpose of the study, as responses from such blocks are believed to have urban influence.

Table 2.4: For urban area

For collecting samples from urban areas of the four districts, 10 % of the total number of wards are selected

District	Total no. of wards in each district	Selected 10 % of the wards
Kamrup	20	2
Tinsukia	20	2
Darrang	10	1
Dhubri	16	2

Table 2.5: Stage 3- Village and household sampling (For rural areas)

Districts	10% of the villages in the selected blocks as shown in Stage 2	20 households from each village
Kamrup	6+4 = 10	200
Tinsukia	18	360
Darrang	6	120
Dhubri	8+4 = 12	240
Total		**920**

Table 2.6: For urban areas

Districts	10% of wards selected as shown in Stage 2 (Table 2.4)	Number of households (distributed proportionately on the basis of rural to urban population ratio in each district)
Kamrup	2	20
Tinsukia	2	90
Darrang	1	8
Dhubri	2	28
Total		**146**

A total of 920 households in rural areas and 146 households in urban areas has been surveyed for the purpose of the study. The proportion of samples in the urban-rural areas of the study is approximately equal to the urban-rural population proportion of Assam. As the district-wise data of the number of bank account holders in all the banks are not available, the proportion method (as used by Sriram, 2011) is considered to provide the idea about the density of the bank accounts in the selected districts. Therefore, the sample size for the study is 1066 prime earner of the households and responses from 1066 respondents was collected from the four districts namely Kamrup, Tinsukia, Darrang and Dhubri. The duration of the survey is December, 2020 to September, 2021.

Objective 5 (Supply side): For the purpose of objective 5, Judgement Sampling has been used and only those FinTech service providers that are promoting financial inclusion and are providing their services in Assam are selected. The Ministry of Electronics and

Information Technology (MeitY) which works towards strengthening the infrastructure for digital payments also keeps a monthly track of the number of cashless transactions initiated by the FinTech service providers. The department ranks Private Sector Banks, Public Sector Banks, Payment Banks, Small Finance Banks and Foreign Banks and then issues a monthly scorecard where the top performers are rated 'good'. The scores are calculated on numerous parameters such as the number of digital transactions, the share of successful transactions on the Unified Payment Interface and the number of merchants onboarded for digital payments (Tyagi, Entracker, 2019; Arora, 2021). According to a scorecard provided by the Ministry of Electronics and Information Technology (MeitY) in terms of digital transactions target achievement for October 2019, Paytm Payment Bank, Fino Payment Bank, Airtel Payment Bank, ICICI Bank, HDFC Bank has been rated 'good'. (Bhakta, 2019). Bank of Baroda which was previously rated as average has been upgraded to good in MeitY scorecard for the month of February and March, 2021 because of its drastic increase in digital payment transactions target achievement, acquiring merchants in rural areas and North-Eastern states (Arora, 2021;). Furthermore, the Bank of Baroda being one of the largest public sector banks in India is taken for the study and India Post payment bank has been included in the study considering its significant role in the rural areas. UCO bank being the lead bank in Darrang, Dhubri and Kamrup districts (three out of four districts surveyed) has been selected for the study. Thus, information collected from the supply side includes two public sector banks (Bank of Baroda, UCO Bank), two private sector banks (HDFC Bank, IndusInd Bank) and two payment banks (Fino Payments Bank, India Post Payments Bank).

2.4.4 Reliability and Validity

Cronbach's alpha has been used to measure the reliability or internal consistency of the scales used in the study. Cronbach's alpha is a widely used measure for reliability and helps in determining the consistency of the measure. The rule of thumb for the acceptable value of Cronbach's alpha is >.70 (George & Mallery, 2003; Hair, Black, Babin & Anderson, 2010).

Table 2.7: The results of the reliability test for the 5-point scale of agreement used in the interview schedule

Purpose of the scale	Cronbach's alpha
Reasons for loans availed from formal financial institutions	.719
To measure the shift towards digital modes of payment Convenience Offers	.835 .892
To measure the reasons for adoption/ non-adoption of FinTech services using constructs from the Technology Acceptance Model and other additional constructs based on the literature survey, which is considered relevant for technology adoption. Latent Constructs: Perceived Usefulness: .914 Perceived Ease of Use: .917 Trust: .942 Government Support: .924 Perceived Risk: .939 Self-Efficacy: .948 Social Influence: .927 Attitude: .857 Intention: .892 **Overall Cronbach's Alpha**	.861

All the scales have Cronbach's alpha above the threshold limit of 0.70. Thus, the scales are considered reliable and can be used for further analysis.

Validity of the questionnaire i.e., Convergent and Discriminant validity has been checked. Convergent validity is used to check that the scale items are closely related whereas discriminant validity is used to see that the items that conceptually should not be related to each other are, in fact, unrelated. The validity results were found to be satisfactory (Refer to Chapter 5, section 5.3.3). Literature review, feasibility study done for preparing the interview schedule and pilot study before conducting the survey in all the districts were done to establish content validity.

2.4.5: Statistical tools and models used for data analysis

Data collected were analysed using frequencies, percentages, crosstab, Chi-square test, Independent samples t-test, One-Way ANOVA, Factor analysis and Regression.

Normality is examined by inspecting the skewness and kurtosis, QQ plots and visual examination of the histogram. According to George & Mallery (2010), the acceptable value of skewness and kurtosis is -2 to +2. Skewness and kurtosis are within the cut-off range as suggested by (George & Mallery, 2010). Furthermore, the QQ plots exhibited a diagonal line and a linear pattern (Morgan, 2017). Thus, it can be concluded that the data are reasonably normal, and with the sample size of 1066, it is considered acceptable to apply parametric tests based on fulfilling other conditions (Choudhury, 2019).

Model used: Technology Acceptance Model [1]put forward by Davis (1989) on the foundation of the theory of reasoned action is concerned with the acceptance and utilisation of technology (Fishben & Ajzen, 1975). In this study, the constructs of TAM 1 such as perceived usefulness, perceived ease of use, attitude and behavioural intention as well as its expanded version TAM 2 (Venkatesh & Davis, 2000), which includes social influence in determining technological adoption behaviour, were utilised. In addition, additional factors deemed relevant for technology acceptance based on a literature review were included in the study to examine the factors influencing the adoption or denial in using FinTech services.

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[1] For details refer to section 5.3.3 of chapter 5

2.4.6: Limitations of study

1. The study does not account for the influence of lendingtechs and insurtechs on the provision of FinTech services to promote financial inclusion. Data for the supply side was collected from public sector, private sector banks and payment banks.
2. The geographical coverage of the study is confined to four districts of Assam based on CRISIL score, literacy rate and multidimensional poverty index.
3. Since FinTech is a continuously evolving sector. Hence, the findings of this work will be more relevant during the contemporary time.