



## DIGITAL FINANCIAL INCLUSION IN RURAL GOA: ADOPTION AND CHALLENGES

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### ABSTRACT

Rapid advancements in digital technology have transformed the financial sector, emphasizing the need for digital financial inclusion. This study examines the extent of digital financial inclusion among the rural population of Goa, the adoption of digital payment platforms, and the barriers that hinder their adoption. This study also aims to find the association between the demographic profile and the level of adoption of digital financial inclusion. The data was collected from 471 respondents in different rural areas of Goa using convenient and snowball sampling. Cross tabulation, chi square test and exploratory factor analysis were used for analysis. The results show that the digital financial inclusion is above average and significant relationship exists between age, education, marital status and occupation with the level of adoption of digital financial inclusion. The exploratory analysis proves that technological and security barriers and personal barriers restrict people from using the financial services.

**KEYWORDS :** Digitalization, financial inclusion, technology, online payment

### INTRODUCTION

Financial inclusion is the process of providing access to formal financial services at an affordable cost, particularly to the marginalized sections of society (Rangarajan Committee, 2008). With rapid technological advancements, digital financial services have emerged as an important tool for promoting financial inclusion and economic development. Services such as online fund transfers, bill payments, mobile recharges, and digital wallets have transformed the way financial transactions are conducted, making them more convenient, efficient, and secure (G. Ghosh, 2021)

In India, the Reserve Bank of India (RBI) and the Government have introduced several initiatives to promote digital transactions. The launch of the Digital India programme in 2015 aimed to develop digital infrastructure, deliver government services electronically, and promote digital literacy (Pandey et al., 2018). Further, demonetization accelerated the adoption of digital payment systems by encouraging consumers to shift from cash-based transactions to digital alternatives (Kamatchi Eswaran, 2019). The growth of digital payment platforms such as Unified Payments Interface (UPI), Aadhaar Enabled Payment Systems (AEPS), mobile banking, internet banking, and digital wallets has significantly increased the use of financial services across the country. The increasing penetration of smart phones and internet connectivity has further facilitated this growth (S. Ghosh, 2021). During the COVID-19 pandemic, digital payments became an essential mode of transaction, supporting the government's vision of a cashless economy (M & Professor, 2021).

Digital financial services are particularly beneficial in rural areas where access to physical banking facilities may be limited. These services reduce transaction costs, save time, improve accessibility, and contribute to economic growth and financial inclusion (Manyika et al., 2016). However, challenges such as lack of digital literacy, security concerns, and limited awareness continue to restrict their adoption among rural populations (Kanungo & Gupta, 2021).

Although several studies have examined digital financial inclusion in India, limited research has focused specifically on rural Goa. Therefore, this study investigates the level of digital financial inclusion among the rural population of Goa, its association with demographic factors, and the barriers affecting its adoption.

### Literature Review

The review of previous literature is divided into three parts

based on the objectives of the study, namely adoption, association, and challenges to digital financial inclusion. With regard to adoption, (Dhanya, 2019) in their study reveals that the negative aspects of physical payments have played an important role in encouraging the adoption of digital payment methods due to their ease of use, transparency, and convenience. (Kaur et al., 2020) highlights the significant growth in mobile applications, their usefulness to customers, effectiveness in transactions, and improved safety. (Saxena & Mokashi Puneekar, 2020) states that digital financial inclusion enhances household entrepreneurship by improving financial literacy and borrowing willingness, thereby contributing to economic growth. (Sanjai et al., 2021) observes that technology has significantly transformed daily life, making transactions easier through the widespread use of smart phones, while the emergence of digital wallet platforms has made online payments more convenient and efficient. (Pal et al., 2021) states that the role of mobile payments increased drastically after demonetization and examines the factors influencing their adoption and continued usage. (S. Ghosh, 2021) explains that advancements in information and communication technology, including smart phones and internet access, have revolutionized payment methods by making transactions smoother and faster, thereby promoting digitalization. (Lee et al., 2023) in their study proves that digital financial inclusion significantly contributes to poverty alleviation, with varying effects across different income groups and regions. Similarly, (Daud & Ahmad, 2023) highlights the dynamic relationship between digital technology and economic growth, emphasizing that financial inclusion strengthens physical infrastructure and supports a country's financial policies. Regarding association, (Gangani, 2021) found a significant relationship between digital financial inclusion and demographic factors such as gender, age, educational qualification, and profession, whereas no significant relationship was found with marital status and monthly income. In terms of challenges, "(Featherman & Pavlou et al., 2023) states that the risk of misuse of personal data during electronic payment processing, along with financial risk, acts as a major barrier to the adoption of electronic payments. According to (Rai et al., 2012), safety and security of mobile wallet payments encourage customers to shift from traditional payment methods, although internet-related issues and reluctance to incur additional transaction costs remain challenges despite the increase in mobile wallet usage after demonetization. (Bailey et al., 2017) emphasizes that privacy concerns play an important role in the adoption of new technologies using the extended Technology Acceptance Model, while (T S & C D, 2017) reveals that although

electronic payments offer numerous benefits and have contributed significantly to the growth of e-commerce, they are also associated with various risks.

### Research Gap

Although several studies have explored digital financial inclusion in India, most focus on urban regions or selected states. No empirical research has been examined in rural areas of Goa.

### Research Methodology

For the purpose of this study primary data was collected by using a structured questionnaire using five point likert scale. The questionnaire was circulated online through Google forms using the convenient sampling method. The questionnaire was divided into 2 sections. The first section focused on the demographic profile and the level of digital financial inclusion, the second section focused on the barriers to digital financial inclusion. The secondary data was used to find out the past literature. Research papers were collected from Science Direct and Emerald from the year 2017- 2023. In total 500 questionnaires were distributed in the different parts of Goa to people from the age group of 15 onwards, out of which 471 responses were received and after scrutinizing, 57 responses were excluded as the respondents were from urban area and 414 respondents from rural area were considered for the study. The methods used for the analysis were Chi square test and exploratory factor analysis.

### The following are the Objectives of the study:

- O1: To study the level of adoption of digital payment platforms among the rural population in Goa.
- O2: To identify the association between the demographic factors and level of adoption of digital financial inclusion
- O3: To identify the barriers to digital financial inclusion.

### The following are the Research questions:

- RQ1. What is the level of adoption of digital payment platforms among Goan rural population?
- RQ2. What is the association between demographic factors and the adoption of digital financial inclusion?
- RQ3. What are the challenges to digital financial inclusion?

### Based on the objectives of the study, the following hypotheses have been formulated for empirical testing

- H0: There is no significant difference in the level of adoption of digital payment platforms among Goan rural population.
- H0: There is no significant association between the demographic factors and the level of adoption digital payment platforms
- H0: There is no significant relationship between identified barriers and digital financial inclusion.

### Scope of the Study

The present study is limited to the rural areas in the state of Goa. This study can be further extended by considering urban areas too. Study can be also done in other states of the country.

## RESULTS AND DISCUSSION

**Table 1: Demographic profile**

|                    | Level        | Count | Total | Proportion |
|--------------------|--------------|-------|-------|------------|
| Gender             | Female       | 215   | 414   | 51.90%     |
|                    | Male         | 199   | 414   | 48.10%     |
| Age                | 15-30        | 241   | 414   | 58.20%     |
|                    | 31-45        | 87    | 414   | 21.00%     |
|                    | 46-60        | 59    | 414   | 14.30%     |
|                    | 60 and above | 27    | 414   | 6.50%      |
| District           | North Goa    | 249   | 414   | 60.10%     |
|                    | South Goa    | 165   | 414   | 39.90%     |
| Marital Status     | Married      | 140   | 414   | 33.80%     |
|                    | Unmarried    | 266   | 414   | 64.30%     |
|                    | Widow        | 8     | 414   | 1.90%      |
| Place of residence | Rural area   | 414   | 414   | 100.00%    |

|                |               |     |     |        |
|----------------|---------------|-----|-----|--------|
| Education      | Below SSC     | 8   | 414 | 1.90%  |
|                | Doctorate     | 4   | 414 | 1.00%  |
|                | Graduate      | 223 | 414 | 53.90% |
|                | HSSC          | 54  | 414 | 13.00% |
|                | Post Graduate | 114 | 414 | 27.50% |
|                | SSC           | 11  | 414 | 2.70%  |
| Occupation     | Employed      | 196 | 414 | 47.30% |
|                | Retired       | 22  | 414 | 5.30%  |
|                | Self employed | 32  | 414 | 7.70%  |
|                | Student       | 134 | 414 | 32.40% |
|                | Unemployed    | 30  | 414 | 7.20%  |
| Monthly Income | 10000 - 25000 | 117 | 414 | 28.30% |
|                | 25000 - 50000 | 92  | 414 | 22.20% |
|                | above 50000   | 73  | 414 | 17.60% |
|                | upto 10000    | 132 | 414 | 31.90% |

The above table presents the frequency distribution of the demographic profile of the respondents. It is observed that the percentage of females using digital payment platforms is higher than that of males. Based on age, respondents in the 15-30 years age group show the highest usage of these platforms. District-wise, respondents from North Goa use digital payment platforms more than those from South Goa. In terms of education, graduates exhibit higher usage compared to other educational groups. Similarly, employed respondents and those with a monthly income above ₹10,000 are more likely to use digital payment platforms.

**Table 2: Level of Financial Inclusion**

| Options       | Weight | Frequency | Weighted Score |
|---------------|--------|-----------|----------------|
| VERY LOW      | 1      | 55        | 55             |
| LOW           | 2      | 26        | 52             |
| AVERAGE       | 3      | 84        | 252            |
| HIGH          | 4      | 144       | 576            |
| VERY HIGH     | 5      | 105       | 525            |
| TOTAL         | 15     | 414       | 1460           |
| Weighted mean | 3.52   |           |                |
| expected mean | 3      |           |                |

The above table shows the level of adoption of digital financial inclusion among the rural population in Goa. The above options were provided to the respondents to rate their level of digital financial inclusion among the rural population in Goa, after which weights were assigned to the frequencies to calculate the weighted score, after dividing the total of weighted score by the total of frequencies we get the weighted mean as 3.52 which is greater than expected mean. We obtain the expected mean by dividing the total of weights by the number of weights. Therefore, the expected mean is 3 and we conclude that the level of digital financial inclusion is above average among the rural population in Goa. Therefore, we fail to accept the null hypothesis.

**Table 3: Association of demographics and level of financial inclusion**

|                |          | Value  | df | p     |               |
|----------------|----------|--------|----|-------|---------------|
| GENDER         | $\chi^2$ | 8.558  | 4  | 0.073 | INSIGNIFICANT |
|                | N        | 414    |    |       |               |
| AGE            | $\chi^2$ | 84.346 | 12 | .001  | SIGNIFICANT   |
|                | N        | 414    |    |       |               |
| DISTRICT       | $\chi^2$ | 4.682  | 4  | 0.322 | INSIGNIFICANT |
|                | N        | 414    |    |       |               |
| RESIDENCE      | $\chi^2$ | NaN    |    |       |               |
|                | N        | 414    |    |       |               |
| MARITAL STATUS | $\chi^2$ | 40.743 | 8  | .001  | SIGNIFICANT   |
|                | N        | 414    |    |       |               |
| EDUCATION      | $\chi^2$ | 58.484 | 20 | .001  | SIGNIFICANT   |
|                | N        | 414    |    |       |               |
| OCCUPATION     | $\chi^2$ | 92.449 | 16 | .001  | SIGNIFICANT   |
|                | N        | 414    |    |       |               |
| INCOME         | $\chi^2$ | 13.273 | 12 | 0.35  | INSIGNIFICANT |
|                | N        | 414    |    |       |               |

The above table shows the association between the demographic profile and the level of digital financial inclusion using the chi square test at 5% significance level. The results show that age, marital status, education and occupation have significant relationship with digital financial inclusion, as their p values are below 0.05. In contrast, gender, district and income have no significant relationship as their p values are above 0.05. Therefore, we fail to accept the null hypothesis in the case of age, marital status, education and occupation and we fail to reject the null hypothesis in the case of gender, district and income.

**Table 4: Barriers to financial inclusion**

|                                                                                             | Technological Andsecurity Barriers | Personal Barriers |
|---------------------------------------------------------------------------------------------|------------------------------------|-------------------|
| (B15)Using internet for online transactions is not safe                                     | .862                               |                   |
| (B5) Fees to access financial services are very high                                        | .861                               |                   |
| (B6) Digital banking is riskier than traditional banking                                    | .851                               |                   |
| (B14)I prefer meeting people face to face for banking transactions                          | .848                               |                   |
| (B7) Lack of privacy in online transactions                                                 | .843                               |                   |
| (B4) Understanding the financial terminology of digital financial products is difficult     | .828                               |                   |
| (B8) Technology used by banks is complex to understand                                      | .814                               |                   |
| (B10) There are chances of fraud                                                            | .764                               |                   |
| (B13) I am not satisfied with digital banking services                                      | .761                               |                   |
| (B3) Connectivity issues involve while performing online banking transactions               | .718                               |                   |
| (B12) It is difficult to remember passwords                                                 | .715                               |                   |
| (B11) Hidden charges are involved in digital financial services                             | .694                               |                   |
| (B9) Terms and conditions related to digital financial services are difficult to understand | .586                               |                   |
| (B2) I don't know how to use a computer/internet                                            |                                    | .839              |
| (B1) Lack of awareness about digital financial services                                     |                                    | .502              |

Exploratory Factor Analysis (EFA) was applied on the sample size of 414 respondents to identify the barriers that restrict the rural people to adopt digital payment platforms. Based on the EFA results, all 15 items were retained, each item loaded strongly on one and only one factor with an Eigen value greater than one. Two factors were generated, and they were named as: Technological barriers and Personal barriers. The derived factors indicate a total variance of 65.047. Therefore, we failed to accept the null hypothesis.

**Table 5: KMO and Bartlett's test**

| KMO and Bartlett's Test                          |                    |          |
|--------------------------------------------------|--------------------|----------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | .944               |          |
| Bartlett's Test of Sphericity                    | Approx. Chi-Square | 4725.871 |
|                                                  | df                 | 105      |
|                                                  | Sig.               | .000     |

The KMO value determines the adequacy of the sample for factor analysis. Since the obtained KMO value is 0.944, the sample is considered highly adequate. Bartlett's Test of Sphericity showed a significance value of 0.000, which is below 0.05, confirming that the collected data is suitable for the study.

**Table 6: Total Variance Explained**

| Component | Initial Eigenvalues |               |              | Extraction Sums of Squared Loadings |               |              | Rotation Sums of Squared Loadings |               |              |
|-----------|---------------------|---------------|--------------|-------------------------------------|---------------|--------------|-----------------------------------|---------------|--------------|
|           | Total               | % of Variance | Cumulative % | Total                               | % of Variance | Cumulative % | Total                             | % of Variance | Cumulative % |
| 1         | 8.590               | 57.269        | 57.269       | 8.590                               | 57.269        | 57.269       | 8.226                             | 54.838        | 54.838       |
| 2         | 1.167               | 7.779         | 65.047       | 1.167                               | 7.779         | 65.047       | 1.531                             | 10.209        | 65.047       |
| 3         | .864                | 5.760         | 70.808       |                                     |               |              |                                   |               |              |
| 4         | .717                | 4.780         | 75.588       |                                     |               |              |                                   |               |              |
| 5         | .614                | 4.094         | 79.682       |                                     |               |              |                                   |               |              |
| 6         | .547                | 3.648         | 83.330       |                                     |               |              |                                   |               |              |
| 7         | .448                | 2.987         | 86.317       |                                     |               |              |                                   |               |              |
| 8         | .433                | 2.885         | 89.201       |                                     |               |              |                                   |               |              |
| 9         | .386                | 2.574         | 91.775       |                                     |               |              |                                   |               |              |
| 10        | .332                | 2.216         | 93.991       |                                     |               |              |                                   |               |              |
| 11        | .235                | 1.565         | 95.556       |                                     |               |              |                                   |               |              |
| 12        | .191                | 1.274         | 96.830       |                                     |               |              |                                   |               |              |
| 13        | .183                | 1.217         | 98.047       |                                     |               |              |                                   |               |              |
| 14        | .152                | 1.014         | 99.062       |                                     |               |              |                                   |               |              |
| 15        | .141                | .938          | 100.000      |                                     |               |              |                                   |               |              |

Extraction Method: Principal Component Analysis.

Only those factors with an Eigen value greater than one were considered for the study, each factor shows the percentage variance in descending order. The Eigen value for factor 1 is 8.226 and factor 2 is 1.531.

**Table 7: Cronbach Alpha**

|                                      | Cronbach's a |
|--------------------------------------|--------------|
| Level of digital financial inclusion | 0.781        |
| No. Of items                         | 1            |
| Barriers                             | 0.942        |
| No. Of items                         | 15           |

The reliability statistics of the Likert scale questions confirm the consistency of the data. The Cronbach's Alpha value for the level of digital financial inclusion is 0.781, while the value for the 15 barrier items is 0.942. Since both values are above 0.7, the data is considered reliable for the study.

## CONCLUSION

The present study concludes that the level of digital financial inclusion in the rural areas of Goa is above average. Based on the association between demographics and level of adoption of digital payment platforms we conclude that age, marital status, education and occupation have a significant relationship and association with the level of adoption of digital financial inclusion and gender, district and income has an insignificant relationship and no association with digital financial inclusion. The results of exploratory factor analysis on barriers shows that the technological and security barriers and personal barriers restrict people the most from using digital payment platforms. The Cronbach alpha values for the Likert scale questions are above 0.7 which indicates that the data collected is reliable for the study. The KMO test indicates that the sample is adequate for the study as the values are above 0.8 and the Bartlett's test of Sphericity shows that the data collected is suitable for the study as the significance level is 0.00 for tests which proves that the data is suitable for the study.

Lastly digital financial inclusion has made wonders by changing our view on the traditional payment methods. Everything has become digitally advanced and has made life quite easy and convenient than before. Gone are the days of long bank queues to withdraw/deposit cash now everything happens with the matter of few seconds at the tips of our fingers. However the acceptance of digital financial services is not fully spread in the rural areas.

## LIMITATIONS OF THE STUDY

The major limitations of this study is that the respondents were only limited to the rural areas of the state of Goa and therefore the findings of this study cannot be generalized. Also, there can be more variables that influence the level of digital financial inclusion that are not considered in this study.

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