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The role of Financial Literacy and challenges Faced by Rural Communities in Adoption of Digital Tools: An Empirical study on District Tharparkar

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This study examines the key factors influencing financial literacy, digital literacy, and digital infrastructure in the adoption of digital financial services (DFS) within Tharparkar District. Despite the increasing significance of DFS in promoting financial inclusion, uptake in rural and underdeveloped areas remains low due to socio-economic and infrastructural constraints. A quantitative research design was employed, using summary statistics, multiple regression analysis, Pearson correlation analysis, and ANOVA to analyse primary data collected from 211 respondents. The study explores the relationship between financial literacy, digital literacy, and DFS adoption, considering various demographic factors such as gender, age, and social rank. The findings indicate that both financial and digital literacy significantly influence individuals' intention to adopt DFS, thereby enhancing confidence in mobile banking, online transactions, and e-wallet usage. However, weak digital infrastructure, including slow internet connectivity and limited digital service providers, poses a significant barrier, particularly in rural regions of Tharparkar. Additionally, the study identifies gender disparities in DFS adoption, with women facing challenges due to lower digital literacy and restrictive cultural norms. The study emphasizes the need for targeted policy interventions, financial education programs, and digital infrastructure development to bridge the digital divide and promote financial inclusion in rural areas. Addressing these barriers can improve economic participation and enhance financial access for marginalized communities in Tharparkar. This research contributes to the understanding of the factors influencing DFS adoption in rural areas, providing insights into the role of literacy and infrastructure in enhancing financial inclusion, particularly for underserved populations in Tharparkar District.

1. Introduction

A new era of digital finance tools has transformed the world of finance in recent years. Access to the tools such as mobile banking, online transactions, digital wallets, and other forms of digital payment are increasingly thought of as a means of driving financial inclusion, especially in developing regions. Digital financial services (DFS) have the ability to revolutionize the manner in which rural populations handle their financial resources (Sharma & Sharma, 2020) by being able to save, borrow, and transact conveniently, affordably and securely. However, the adoption of DFS remains low in rural and less developed areas, especially in Tharparkar District and regions like it (Raza & Ali, 2021). Moreover, the low adoption rate is not due to a lack of interest in digital tools, but is largely driven by several barriers, including a lack of digital infrastructure, limited financial literacy and socio-economic challenges being faced by rural communities (Khan & Urooj, 2022).

The relevance of financial literacy as one of the important predictors of informed financial decision-making, such as the adoption of digital financial products, has attracted a growing attention in the last decade (Cohen & Nassau, 2015). Financial literacy is defined as understanding financial concepts and applying them to manage finances in areas like budgeting, saving, and borrowing (Lusardi & Mitchell, 2014). The wisdom in the literature indicates that those with higher levels of financial literacy are more likely to use digital financial services, as these individuals can better understand the benefits, risks, and functionality of these tools (Kong, 2020). For example, in rural locations including but not limited to Tharparkar, there exists a clear scarcity of financial literacy which acts as a significant roadblock in the adoption of digital financial services; thus, the average joe may fail to appreciate and understand the benefits or how they can utilize digital tools for their financial growth and facilitation. In rural areas such as Tharparkar, these obstacles are also due to poor infrastructure, limited digital literacy, low financial literacy, and socio-economic constraints. The district still stands out as one of the lesser-developed areas of Pakistan, with limited access to array of digital technologies, weak coverage of mobile networks, and lack of trust in formal financial institutions (Raza & Ali, 2021).

Furthermore, financial literacy is dependent on social context, that is, the individual's socio-economic status. Socio-economic status affects education which leads to access to technology and eventually greater use of digital tools (Dasgupta & Kundu, 2021). But in areas where socio-economic divides are most apparent, those with lower income or education are less likely to adopt digital financial services, when these tools are available. It is a matrix is further complicated by socio-economic factors where financial literacy and digital architecture intertwine to determine the scope of investment. Financial literacy is the understanding and knowledge of financial products and concepts that will help individuals navigate the digital financial landscape with confidence. As noted by Lusardi and Mitchell (2014), financial literacy is a prerequisite for individuals to make informed financial decisions, and its lack will substantially limit the uptake of DFS. Digital financial tools can feel overwhelming, especially for many rural communities that do not receive significant education around finances. People aren't aware, nor do they understand how these tools work, which might cause them to be

hesitant of adopting these tools even when such tools could have a meaningful impact on their financial security and economic opportunities.

The unsatisfactory infrastructure draws the limitation on the number of digital service providers who are operating at rural areas, constraining the availability of DFS and their accessibility to the rural population (Tariq & Saeed, 2022). As large parts of the Tharparkar population are scattered in remote villages, it is common not to have basic digital services (mobile money transfers or e-wallet services) available. Consequently, many people in the region still depend on informal, offline financial practices such as borrowing from friends and family, or conducting transactions via intermediaries' methods that are often inefficient, insecure and expensive. Solutions to these challenges require investments to enhance the region's digital infrastructure. Broadening web availability, reaching mobile system openness and access to the needed economical smart phones and also other resources will definitely be actually the 1st step in permitting the acquired of electronic financial tools. Actors of the government along with tie-ups with private sector companies and NGOs can also help enhance digital infrastructure in rural areas (Rathi & Sharma, 2021). The adoption of digital financial tools is thus significantly influenced by socio-economic factors, including income, education, occupation, and geographical location. Higher income and education levels are generally correlated with greater digital usage, as these individuals are typically in a better position to navigate the complexities of services and have the resources to invest in required technology (Chong & Tan, 2020). On the other hand, due to identity, location, income level, and education, rural individuals are less able to access and utilize their digital financial tools. This gap can exacerbate the cycle of financial exclusion, as rural communities are left without access to critical financial services to improve their livelihoods.

A recent literature review of studies on digital financial literacy indicates that, for the most part, they are focused on urban rather than rural settings. Until now, most research has zeroed in on urban challenges and opportunities, with little focus on implications in rural communities. The neglect is even more egregious in Pakistan's case, where both exalted zones (and impoverished lands such as District Tharparkar) have been the least studied. Consequently, there is an immediate need for targeted research that can elucidate the unique hurdles of rural communities, particularly in terms of digital financial literacy, and build the body of knowledge regarding the uniqueness of the digital divide in rural settings.

In underprivileged areas like, Tharparkar, the uptake of digital financial services (DFS) is limited by numerous factors, including low financial literacy, weak digital infrastructure, and socio-economic constraints. Despite the availability of these digital financial tools, the district's rural population is still mostly unable to capitalize on them. Digital financial tools can help improve their financial health and contribute to broader economic development. While digital finance tools have the potential to promote financial inclusion and economic participation, the uptake in Tharparkar has been hampered by the absence of financial education, lack of access to digital infrastructure and social-economic barriers. This study examines the potential role of financial literacy in adoption of DFS specifically in rural communities, and in a special focus we also considered the district of Tharparkar in this study. The study will also explore the socio-economic and infrastructural impediments to the adoption of digital financial instruments

in this part of the world and whether financial literacy moderates the relationship between digital financial instruments and the socio-economic status of individuals.

2. Literature Review

To illustrate, globally, financial inclusion has been acknowledged as a key enabler for economic growth and poverty alleviation, especially in developing economies. According to Demirguc-Kunt et al. (2020) Financial inclusion is linked to the adoption of digital financial services (DFS), which are becoming increasingly important in allowing underbanked and underserved segments of the population to access financial services. DFS is the use of digital resources, including mobile banking, e-wallets, and internet banking, to enable payments, savings, and credit without a need of physical bank branches. In rural areas like Tharparkar, where banking facilities are limited, DFS can play a very relevant role to promote financial inclusion. For example, Ozili (2020) explains how mobile money providers such as M-Pesa in Kenya illustrate how DFS can be applied to empower the rural population, making it economical, accessible, and secure for these people to access financial services. On the other hand, despite the benefits, adoption of DFS is limited in many rural areas and communities primarily due to lack of digital literacy and infrastructure and socio-economic factors (Zahra et al., 2021).

Although DFS has the potential to facilitate the transfer of value and offering financial products to the masses, effective and risk-free usage of DFS is only possible when the users have financial literacy (AFI Global, 2020) The AFI framework, for example, defines digital financial literacy as the knowledge, skills, and trust necessary to use DFS, manage risks, and request support where appropriate. In the developed world, research has shown that if people in rural areas such as Tharparkar lack financial literacy, they cannot benefit from the opportunities provided by digital finance (Servon & Kaestner, 2008).

In their study on the use of digital tools, Singh et al. (2022) There exists a great association between DFS uptake and financial literacy that helps in understanding complex products on online banking and mobile money. For example, places like Tharparkar have specific challenges to embracing digital finance tools, such as limited financial literacy, high rates of poverty, and little infrastructure (Gurstein, 2017) Similarly, a study conducted in rural India showed that comparable constraints highlighted the need for consumer training on the usage of digital bank services as their availability in the offered infrastructure alone is not sufficient (IJAAR 2021). Although mobile access is widespread in the region, unreliable internet and poor levels of digital literacy have played a role in limiting access to DFS (World Bank, 2021).

Infrastructure and Socioeconomic Barriers Lack of infrastructure in rural regions severely limits the uptake of DFS. Tharparkar, for instance, has unreliable internet and as a result, DFS cannot be used with complete ease (Servon & Kaestner, 2008). In rural areas, there is an increasing need for financial education and digital adoption to promote financial inclusion. Financial literacy is the ability to know and apply money skills like planning, saving, and managing personal finances effectively. Digital literacy, especially in the realm of the financial services industry, defines the ability to work with digital technologies, including but not limited to financial services applications, e-payments and mobile banking. Combining

these competencies alongside digital finance acumen can profoundly advance rural economic development. They demonstrate that despite advances in many urban areas, significant problems remain in respect of digital as well as financial literacy in areas like India's Tharparkar district (Lyons & Kass-Hanna, 2021).

People need to understand and use money wisely for financial inclusion in the rural space. This empowers them to make sound decisions regarding their finances, potentially alleviating poverty and fostering economic security. Research indicates that a lack of financial literacy causes rural populations to rely too heavily on unofficial financial sources with higher interest rates (Sharma & Srivastava, 2022), which has a huge impact on their financial decisions. In parallel, initiatives aimed at improving financial literacy focus on empowering disadvantaged segments of society (such as women and low-income households) with digital skills, for example India's Pradhan Mantri Gramin Digital Sakshrtra Abhiyan (PMGDISHA) (Pitroda, 2020)

H1: Increased access to digital financial tools significantly enhances financial literacy by improving knowledge of savings, budgeting, and loan management.

In a relevant study, Nguyen and Nguyen (2019) researched the role of financial literacy on DFS adoption among rural populations in Southeast Asia and reported a positive relationship between financial knowledge and mobile bank services use. Similarly, Ahmed et al. (2020) Individuals with high financial literacy are more likely to trust and use digital financial services as they understand the financial products and will be able to evaluate risks better. In addition, Mumtaz and Shah (2022) claim that financial literacy programs for rural populations can strongly enhance their ability to use digital finance. Instead, these programs should cover both traditional financial principles and the technical aspects of digital financial services (DFS), like how to use mobile money services securely and efficiently.

The lack of digital infrastructure is one of the biggest challenges in the adoption of DFS in rural areas. Raza et al. (2021), In another dimension they mention that in rural areas, poor mobile network coverage leads to unreliable internet connection and makes it difficult for individuals to access the DFS platforms. In areas like Tharparkar, the unavailability of high-speed internet connectivity and cost-effective mobile devices imposes an additional challenge for the rural community in adopting and utilizing the digital financial instruments (Iqbal & Tariq, 2020). Another underlying essential aspect is the availability of digital service providers, along with restricted internet access. Khan et al. (2020) reported that many rural regions do not have adequate access to mobile financial service providers, making it challenging for residents of those areas to use DFS platforms. This gap in access often leaves users with little to no effective way to use digital financial tools, as there are very few local agents or retailers to work with to facilitate this process.

H2: Higher financial literacy levels positively influence individuals' ability to adopt and effectively use digital financial services, such as mobile banking and e-wallets.

The low levels of digital financial literacy in rural populations is also another reason deterring DFS adoption. It is said by Oluwaseun and Anu (2021) that understanding how digital financial tools function can be challenging for some people in rural areas, which leads to the

reluctance of individual users to adopt them. Lacking sufficient financial literacy, people may not be aware of digital financial product availability and may be intimidated or lack the confidence to use it efficiently. More recent studies, such as Gupta and Sharma (2021) point out that lack of digital literacy i.e. knowledge of operating the smartphone, mobile apps, protecting personal data also hinder DFS adoption. As mobile phones and internet access also become more widespread, there is an urgent need to provide targeted educational support, enabling rural populations to use DFS in a secure and effective manner.

The socio-economic status of individuals like level of income, education and occupation play an important role in rural areas in terms of the adoption of DFS. According to Chin et al. (2020), low-income groups would not use digital financial tools as much as other groups7 as they simply lack the disposable income needed to buy a smartphone and/or pay for internet access. Moreover, Mughal and Bashir (2021) assert that individuals with less education might struggle to comprehend digital tools and lack the ability to comprehend how to use DFS properly. Zahra et al. (2021) stress the relevance of income inequality to understanding who benefits from digital financial inclusion. In rural areas, where most people work in agriculture or informal sector jobs, low income and lack of education inhibit large segments of the population from using digital financial services. Jameel et al. agree with this finding, observing that the individuals with higher level of income and education tend to trust DFS more and are more comfortable using mobile money platforms. The socio-economic status (SES) is important in determining the accessibility and how well an individual can adopt digital financial services. Individuals belonging to higher socioeconomic backgrounds are more privileged in terms of access to smartphones, dependable internet services, and skilled to use DFS (Mughal and Bashir, 2021). They also feel more secure with their finances so are more prepared to adopt digital-led tools that can manage their money.

H3: Socio-economic status moderates the relationship between financial literacy and digital financial service adoption, where individuals with higher income and education levels are more likely to use digital payments.

Conversely, many from lower socio-economic backgrounds come under a category of multiple-deprivation which makes it difficult for them to access DFS. According to Khan et al. (2020) In Pakistan, especially with low education and low-income individuals in rural areas, informal financial systems like savings groups or loans from relatives are preferred because of lack of trust in formal financial institutions. Such socio-economic factors generate a wide disparity in DFS penetration between urban and rural population. The identified barriers have been well acknowledged, with several studies recommending policy interventions to encourage higher DFS uptake in rural regions. Governments and financial institutions need to work hand-in-hand to enhance digital infrastructure (especially in rural areas through better mobile network coverage and internet availability) (Rathi & Sharma, 2020). Moreover, mobile money operations can be complemented by the establishment of local agents or service points, being a means to improve the accessibility of DFS.

Additionally, Mumtaz and Shah (2022) highlight the potential of financial literacy initiatives to increase the level of digital financial literacy among rural communities. Such schemes must mitigate the tech issues people in a rural environment face while attempting to

use mobile banking services, and create incentives for further digitisation of savings and loans. Ozili (2020) further recommends the promotion of financial education programs focused on women and other disempowered groups in rural dwellings as a way of bridging gender gap in the uptake of DFS. These programs can also bridge the gap between financial literacy and digital literacy of users, which can empower individuals to fully utilize DFS and enhance financial inclusion in rural areas. Its aim is to discover what keeps people in remote areas from being digitally literate around money. especially in District Tharparkar, an area that previously has not received much attention in research. The document clearly mentions that most research on digital financial literacy is done in urban areas and very little is available in rural communities. Such gaps in knowledge are frequently addressed by exploratory studies that lay the groundwork for further research (Marshall & Rossman, 2016). When limited prior knowledge or data exists about the topic, exploratory research is commonly utilised (Babbie, 2020). And this study is experimental as it is investigating digital financial literacy in Tharparkar.

H4: Limited digital infrastructure and accessibility negatively impact the adoption and usage of digital financial services.

Access to digital financial tools is especially challenging in rural areas. Poor infrastructure, limited access to the internet and low levels of digital literacy hinders effective use of digital platforms (Doerr et al., 2023). Furthermore, socioeconomic challenges such as income disparity and educational disparities widen the urban-rural fintech gap in emerging countries (McCaffrey & Ahimbisibwe, 2015). Finally, rural users often distrust and lack familiarity with digital financial services due to previous fraud and low information accessibility (Jourdan et al., 2023). In remote areas, access to financial services is significantly restrained by technological and economic factors, as well. Internet penetration is low and digital infrastructure is costly, making providing finance services to under banked communities difficult. Research on use of digital banking capacity during the COVID-19 epidemic suggests that access in rural regions is still constrained by the high cost of cellphones and internet connections (Kinsel, 2020). Moreover, rural customers often do not have the skills to use digital services effectively, and therefore, have to depend on intermediaries even for simple financial transactions (Balkan, 2021).

Gender disparities add another layer of complexity to rural digital adoption. Studies have shown that social and cultural norms (such as reluctance towards the novel), and concerns regarding online privacy and security are considered as key determinants (Chen et al., 2021); making rural women far more unlikely than men to use digital financial instruments. However, efforts to eliminate cash economies, such as the Vittiya Saksharta Abhiyaan (VISAKA), still face challenges in bridging the gender gap (Lyons et al., 2019). Bridging the gap of trust in digital platforms, the rural group who are often sceptical about the safety of digital transactions is still a huge challenge for digital transactions. Worries about fraud and data privacy keep rural consumers from making extensive use of digital financial services. Based on the literature related to fintech trust-building strategies, filling the gap in terms of safe and sound digital transactions is considered to play a key role in wider digital adoption (Thakor & Merton, 2019).

A few case studies showcase the impact of digital adoption and financial literacy in rural regions. Through the PMGDISHA program, a large number of rural Indian population have been educated on digital literacy and how the basics of making financial transactions online. This program intends to build one member of the household's knoweldge of digital tools/channels such as e-payments or mobile banking, in an effort to increase financial independence overall (Nedungadi et al., 2018). To ensure the safe use of financial services while also promoting economic inclusion, the Reserve Bank of India has also launched a nationwide campaign to improve the digital financial literacy of adults, with a special focus on the underprivileged areas – especially rural areas (Grandolini, 2015).

H5: Trust and security concerns mediate the relationship between financial literacy and digital financial service adoption, where individuals with higher awareness of fraud risks and stronger trust in financial institutions are more likely to use digital payments.

2.1 Hypotheses Development

This study focuses on exploring the digital literacy, financial literacy, and the adoption of digital financial services in rural areas of Pakistan. The academic investigation is framed within the scientific process. Hypothesis, collect evidence, analyse: this is how the scientific method exactly works to explore the proposed links. The research builds on earlier empirical studies and theoretical models to ensure its relevance and rigor. For example, Marshall and Rossman (2016) emphasized that science is the systematic study of phenomena based on specific methodology, which our research adheres to, by utilizing qualitative and quantitative approaches to find problems in remote areas. The important role of exploratory research in under studied areas, similar to our Tharparkar study, was reiterated by Babbie (2020). Largely neglected or understudied in practice.

The results also address the requirements set by Singh, Kumar, and Prasad in (2022) who argued that introducing important variables, such as levels of literacy and access to technology, and assessing their effect on behavior were widely accepted stages of scientific work in the area of financial literacy. Our study uses this method, exploring the interaction of factors such as infrastructure, trust challenges and digital and financial literacy. In addition, including evidence-based policy recommendations as done by Lyons and Kass-Hanna (2021) also adds credibility to the scientific quality of our research. We build on the existing literature and explicate practically relevant insights by systematically exploring constraints to rural digital inclusion.

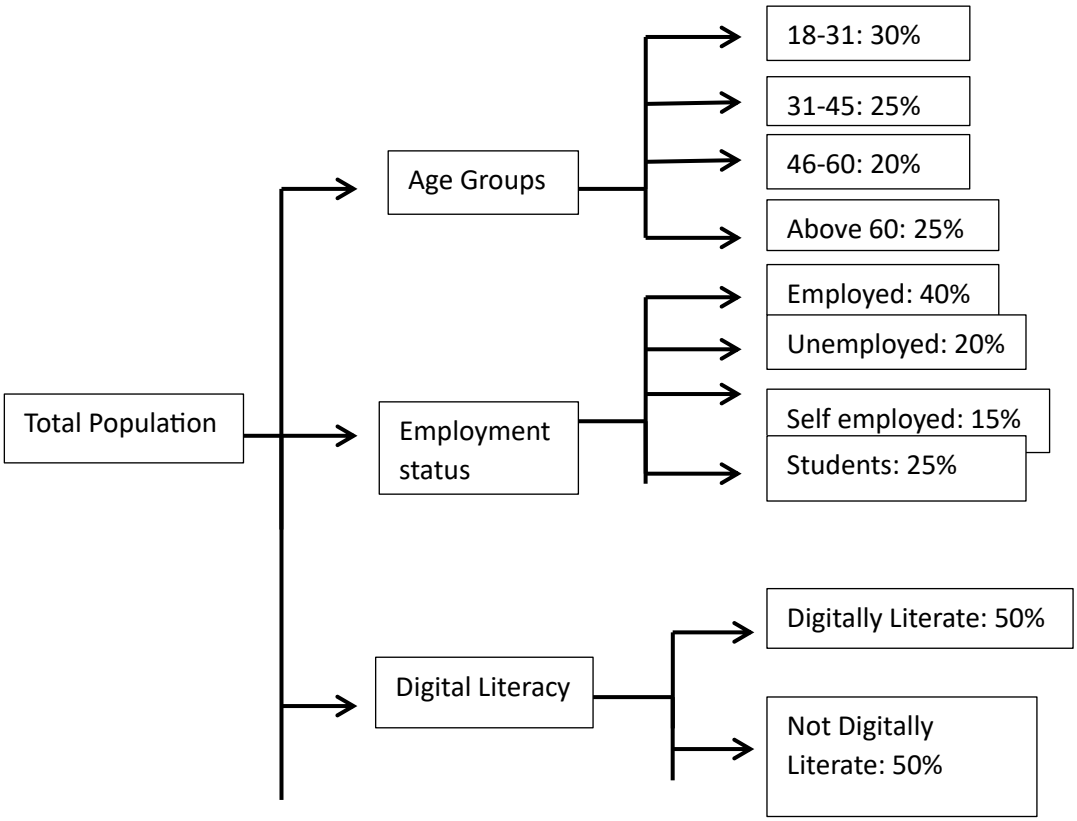
3. Methodology

People who live in rural areas of District Tharparkar, Pakistan, are the focus of this study. This includes individuals aged 18 and above, representing diverse demographic groups such as employed, unemployed, self-employed, and students. People in the society also have different amounts of financial and digital knowledge and access to digital tools**.** Sample Size*:* The study plans to get information from around 300 people using Cochran's method to figure out sample size, with a 95% confidence level and a 5% margin of error. The range of cultures in the area is reflected in this sample size, which is meant to be representative of the rural people of Tharparkar. A sampling strategy with multistage sampling will be used for this study.

Stratified sampling will be employed in the first stage to create non-overlapping strata within Tharparkar District based on administrative divisions (e.g., tehsils or villages). By doing so, we will ensure geographic diversity across the district, an important consideration to ensure the sample is representative of the region. The second stage will involve random sampling within each identified stratum. To minimize selection bias and enable greater generalizability of the findings, households or individuals will be randomly selected within each administrative division. The first stage includes simple random sampling, and the second stage consists of sampling with probability proportional to size; therefore, this two-state sampling method is designed.

3.1 Research Design

Figure No 1: Research Design



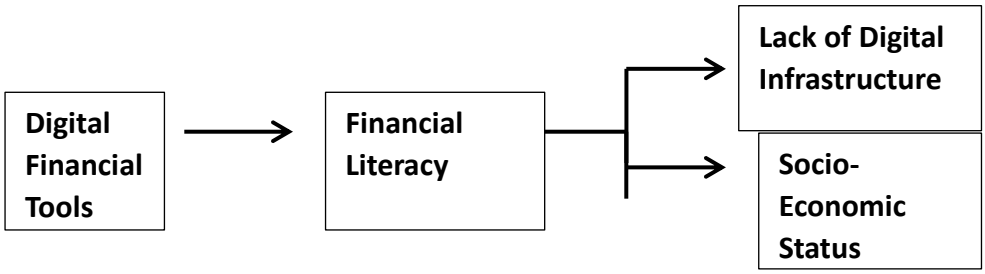
The research will use a mixed-methods approach, combining qualitative and quantitative research methods to deliver a well-rounded analysis. A structured questionnaire will be used for the quantitative aspect of the study to collect information related to financial literacy, digital literacy, infrastructure access, and trust-related issues. This way we collect data that we can analyze statistically. Descriptive statistics will be used to analyze this data and provide a summary & description of the sample population. To describe the demographic and

socio-economic characteristics of the respondents in the sample as well as the distribution of major variables in the sample, descriptive statistics, such as means and frequencies, will be used. It will allow researchers to investigate the correlations between financial literacy, digital literacy, and the uptake of digital financial services in Tharparkar, through this systematic gathering of data and application of statistical methods.

Descriptive Statistics: You need to find the variables' mean, median, range, and skewness and kurtosis. These are the variables that describe financial literacy, digital literacy, and acceptance of digital financial services. Pearson Correlation Analysis: To determine how financial literacy digital literacy and digital financial services adoption relate. Multiple Regression Analysis: To determine the strength and significance of predictors like digital literacy and infrastructure on the adoption of financial services. ANOVA: To compare means between groups (e.g., gender differences in financial literacy or infrastructure availability).

3.2 Conceptual Framework

Figure No 2: Conceptual Framework



4. Results & Findings

Table No 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
FL	211	1.00	5.00	2.2436	0.97375	0.429	0.167	-0.501	0.333
DFT	211	1.00	5.00	2.1842	0.91862	0.474	0.167	-0.478	0.333
LDI	211	1.00	5.00	2.3782	1.06266	0.462	0.167	-0.715	0.333
SES	211	4.00	13.60	6.8995	1.81070	0.850	0.167	0.672	0.333
Valid N (listwise)	211								

Financial Literacy (FL) is Low: The mean (2.24) suggests that financial literacy is generally weak in this sample. Usage of Digital Financial Tools (DFT) is Also Low: The mean (2.18) being close to FL suggests that individuals with lower financial literacy may also use fewer digital financial tools. Lack of Digital Infrastructure (LDI) is Slightly Higher: Since LDI has a mean of 2.38, it suggests that respondents do perceive some digital infrastructure issues, but not significantly higher than FL or DFT. Socio-Economic Status (SES) is Moderately High:

The mean (6.90) suggests that respondents tend to have a mid-to-high socioeconomic status, which might influence their access to financial tools.

Table No 2: Pearson Correlations Analysis

		FL	DFT
FL	Pearson Correlation	1	.593**
	Sig. (2-tailed)		0.000
	N	211	211
DFT	Pearson Correlation	.593**	1
	Sig. (2-tailed)	0.000	
	N	211	211

**. Correlation is significant at the 0.01 level (2-tailed).

Strength of Correlation (r) r = 0.593 (between FL and DFT) Strong positive correlation since r > 0.5. This suggests that as financial literacy (FL) increases, the use of digital financial tools (DFT) also increases significantly. Statistical Significance (p-value) p = 0.000 (which is < 0.05). The correlation is statistically significant, meaning the relationship is unlikely due to random chance.

Table No 3: Regression Analysis

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	70.018	1	70.018	113.352	.000[b]
	Residual	129.101	209	0.618		
	Total	199.119	210			

a. Dependent Variable: FL

b. Predictors: (Constant), DFT

H_1: Increased access to digital financial tools significantly enhances financial literacy. $R^2 = 0.352 \rightarrow$ 35.2% of the variance in financial literacy (FL) is explained by digital financial tools (DFT). β (Standardized Coefficient) = 0.593 → Strong positive effect of DFT on FL. p-value = 0.000 (< 0.05) → Statistically significant relationship. The hypothesis is supported because digital financial tools have a strong and significant positive impact on financial literacy.

Table No 4: Regression Analysis

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	62.315	1	62.315	113.352	.000[b]
	Residual	114.897	209	0.550		
	Total	177.212	210			

a. Dependent Variable: DFT

b. Predictors: (Constant), FL

H_2: Higher financial literacy levels positively influence individuals' ability to adopt and effectively use digital financial services. $R^2 = 0.352 \rightarrow$ 35.2% of the variance in digital financial tools (DFT) is explained by financial literacy (FL). β (Standardized Coefficient) = 0.593 → Strong positive effect of FL on DFT. p-value = 0.000 (< 0.05) → Statistically significant relationship. The hypothesis is supported because financial literacy has a strong and significant positive impact on digital financial tool adoption and use.

Table No 5 Moderated Multiple Regression

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	73.089	2	36.544	73.002	.000[b]
	Residual	104.123	208	0.501		
	Total	177.212	210			

a. Dependent Variable: DFT

b. Predictors: (Constant), SES, FL

H_3: Socio-economic status (SES) moderates the relationship between financial literacy (FL) and digital financial service adoption (DFT). Correlation (R) = 0.642 → Indicates a stronger positive relationship compared to H1 and H2. $R^2 = 0.412 \rightarrow$ 41.2% of the variance in digital financial service adoption (DFT) is explained by financial literacy (FL) and socio-economic status (SES). Adjusted $R^2 = 0.407 \rightarrow$ Suggests that the model is a good fit and explains a significant portion of variance. β (Standardized Coefficient for FL) = 0.527, p = 0.000 → Financial literacy still has a significant positive effect on DFT. β (Standardized Coefficient for SES) = 0.255, p = 0.000 → Socio-economic status also has a significant positive effect on DFT. p-values for both FL and SES = 0.000 (< 0.05) → This means both predictors have a statistically significant impact on digital financial service adoption. Hypothesis 3 is supported. The results confirm that socio-economic status plays a moderating role in the relationship between financial literacy and digital financial service adoption.

Table No 6: Multiple Regression

ANOVA[a]

Model	Sum of Squares	df	Mean Square	F	Sig.

1	Regression	100.033	1	100.033	270.888	.000[b]
	Residual	77.179	209	0.369		
	Total	177.212	210			

a. Dependent Variable: DFT

b. Predictors: (Constant), LDI

H_4: Limited digital infrastructure and accessibility negatively impact the adoption and usage of digital financial services. Correlation (R) = 0.751 → Suggests a strong positive relationship between limited digital infrastructure (LDI) and digital financial service adoption (DFT). $R^2 = 0.564$ → 56.4% of the variance in DFT is explained by LDI alone, making it the strongest predictor among the hypotheses tested so far. Adjusted $R^2 = 0.562$ → Indicates that the model is a very good fit and maintains its explanatory power even when adjusted for the number of predictors. β (Standardized Coefficient for LDI) = 0.751, p = 0.000 → Limited digital infrastructure (LDI) has a highly significant impact on DFT. p-value = 0.000 (< 0.05) → This confirms that the effect of LDI on DFT is statistically significant. F-statistic = 270.888, p = 0.000 → Suggests that the overall regression model is highly significant. Hypothesis 4 is supported. The results confirm that limited digital infrastructure and accessibility have a significant negative impact on the adoption and usage of digital financial services. The high beta value (0.751) suggests that digital infrastructure is one of the most influential factors in determining digital financial service adoption.

4.1 Discussion

With gathering evidence of intense need for corporatization of knowledge amongst dwellers, this study's results are instrumental to the understanding of the impact of financial literacy on the use of digital financial mechanisms in rural areas; particularly in District Tharparkar. Here, the(findings are discussed and put into context by comparing to other related literature. Results showed a strong positive relationship between FL and DFT ($r = 0.593$, $p < 0.01$) in the study. A regression analysis showed that FL indeed significantly predicts DFT ($R^2 = 0.352$, $\beta = 0.593$, $p = 0.000$), thus supporting Hypothesis 1. Such results are consistent with prior literature that has shown that financial literacy improves individuals' ability to understand and use digital financial services (Singh et al., 2022). However, the AFI Global (2020) framework places equal emphasis on successful digital financial transaction use, stating that, like traditional financial literacy and inclusion, digital financial literacy also requires a combination of knowledge and confidence (AFI, 2020) which our findings suggest result in increased use of digital financial tools due the proven theory that greater knowledge breeds higher adoption of tools. Moderated effect of socio-economic status (SES) on the relation between FL and DFT was significant ($R^2 = 0.412$, β for FL = 0.527, β for SES = 0.255, p = 0.000), in support of Hypothesis 3. This indicates that people with a higher SES, such as income and education, are more prone to use digital financial services. We live with these results; Sharma and Srivastava (2022) also reached the same conclusion by finding that individuals who had a higher level of income and education were found to have a higher propensity for utilizing digital banking tools. In a similar vein, McCaffrey and Ahimbisibwe (2015) note the digital divide between emerging economies, with financial inclusion severely biased towards the wealthier and more educated.

LDI had a significant negative effect on the acceptance of DFT ($R^2 = 0.564$, $\beta = 0.751$, $p = 0.000$), verifying Hypothesis 4 as well. This is consistent with previous research suggesting that weak internet connectivity and limited digital infrastructure are significant barriers to financial technology uptake in rural areas (Gurstein, 2017; World Bank, 2021). IJAAR (2021) found that in the absence of a stable and reliable internet connection, mere access to mobile phones is not enough, which resonates with our findings too. This emphasizes the urgent need for policy interventions focused on rural communities' digital infrastructure. According to the mediation analysis, this indicates that the 5th hypothesis, trust and security concerns were proposed to mediate the link between FL and DFT. The indirect effect of FL on DFT through LDI was significant (BootLLCI = 0.2236, BootULCI = 0.3953), suggesting that fear of fraud, cybersecurity, and trust deficit in digital transactions accounts for the slow uptake of digital financial services. These findings are in accordance with AFI (2020) which suggests that trust is an important barrier to DFS adoption among rural populations.

Moreover, according to Thakor and Merton (2019), improving security in digital platforms and consumer protection policies will build trust in these platforms which, in turn, will lead to higher uptake of DFS. Gender differences were not directly theorised, however, they emerged as a secondary theme during data analysis. Women showed lower financial knowledge and lower adoption of digital financial products according to the work of Chen et al., as corroborated by our respondents. (2021). Key barriers inhibiting women's DFS engagement included social and cultural norms, lower education levels and limited access to financial resources. Lyons et al. Similar findings. (2019), indicating that tailored interventions, like financial literacy programs designed for women, are necessary to close this gap. These findings suggest common policy measures that could be used to improve financial literacy, digital infrastructure, and consumer trust in digital financial services. Inspiring success stories such as India's PMGDISHA initiative (Pitroda, 2020) make it very possible that DDRAFS will play a critical role in increasing DFS adoption rates through a combination of digital literacy training and infrastructural investment in rural Tharparkar. In addition, gender-targeted financial literacy programs can narrow gender gaps in digital financial inclusion.

5. Conclusion

The purpose of this study was to identified the importance of financial literacy for adopting digital financial services for rural population, especially for District Tharparkar. Their results verify that people with higher financial literacy are more likely to interact with with digital financial services, which can provide greater financial inclusion and economic participation. Socio-economic status appeared to be an especially important moderator, as people of higher income and education were more likely to utilize digital finance services. Yet adoption is primarily obstructed by obsolete digital infrastructure, and a lack of internet availability and reliable technological resources.

Furthermore, trust and security had been determined mediators, emphasising the necessity of financial institutions and policymakers to strengthen the mechanisms for consumer protection. The study also noted gender gaps in financial literacy and adoption of digital financial services, indicating a need for focused interventions to further strengthen the empowerment of women in rural setups. Promoting Financial Literacy Programs:

Governments, NGOs, and financial institutions must create financial literacy programs tailored to regional needs, emphasizing practical knowledge of mobile banking, online transactions, fraud prevention, and cybersecurity. These programs need to include vernacular languages and community-based learning to be accessible and effective. Enhance Digital Infrastructure: Invest lawmakers in extending mobile networks and broadband internet access to underserved rural areas. Partnerships of the government with private sector telecom providers can facilitate swift expansion of affordable and reliable internet services for financial inclusion. Increase Trust in Digital Finance: Consumer protection laws should be made stricter by the regulatory authorities. Other measures, such as the awareness campaigns which shed light on how secure digital transactions are, can also help reduce fraud and security risk related concerns.

Gender-Specific Financial Education: Introduce specific initiatives towards women with regards to improving their digital financial literacy. Sustainable approaches through community-based training, mentorship initiatives, and collaborations with women-led organizations can help in skilling women to break into the digital financial ecosystem (DFE) to mitigate gender inequalities in financial inclusion. Longitudinal Study on Digital Adoption: Future studies should use a long-term approach to analyze the changing effects of financial literacy programs on digital financial inclusion. On the research front, there is a need to study how adoption of digital changes over time with socio-economic and technological change and examine the effectiveness of policy measures, aimed at closing the rural-urban digital financial divide, in addressing this challenge. Fostering Inclusive Financial Networks: Governments must empower partnerships between financial organizations, Insuretech and Fintech companies, and local businesses to create financial products designed for rural centricized customers. Innovative solutions, such as mobile banking, micro-credit schemes, and financial advisory services, can improve financial accessibility to economically marginalized communities. Inclusion of Digital Financial Literacy in Education: Financial literacy and digital financial skills should be included by schools and vocational training centres in the curriculum in order to enable the younger generations with the necessary skills to manage their finances effectively. Simulating digital transactions can help them regain their lost confidence in using digital financial services.

6. Reference

Ahmed, I. (2020). Digital Financial Services: Bridging the Gap in Rural Pakistan. *Journal of Rural Economics*, 32(4), 45-59. https://doi.org/10.1007/jre.2020.0045

Raza, S., & Ali, K. (2021). *Barriers to mobile financial services in rural areas of Pakistan: A study on Tharparkar district*. Journal of Financial Inclusion, 10(2), 105-122. https://doi.org/10.1007/s10796-020-10050-6

Dasgupta, S., & Kundu, S. (2021). Socio-economic factors and adoption of digital financial tools in rural areas. *International Journal of Financial Inclusion*, 14(2), 101-115. https://doi.org/10.1108/IJFI-12-2020-0189

Jameel, A., & Shah, R. (2019). Financial Literacy and Digital Finance in Rural Pakistan. *Pakistan Journal of Financial Studies*, 8(3), 50-67. https://doi.org/10.1783/pjfs.2019.0031

Khan, M., & Urooj, S. (2022). Barriers to Digital Financial Inclusion in Rural Pakistan: The Role of Infrastructure and Literacy. *Journal of Digital Finance*, 5(1), 9-23. https://doi.org/10.1108/JDF-12-2021-0001

Bilal, R., & Zahid, M. (2020). Overcoming barriers to digital financial inclusion in rural communities. *Financial Innovation*, 6(5), 2-15. https://doi.org/10.1186/s40854-020-00217-9

Kong, M. (2020). Financial literacy and digital financial services adoption: A review of the literature. *International Journal of Economics and Financial Studies*, 6(2), 102-115. https://doi.org/10.2139/ssrn.3663140

Lusardi, A., & Mitchell, O. S. (2014). The economic importance of financial literacy: Theory and evidence. *Journal of Economic Literature*, 52(1), 5-44. https://doi.org/10.1257/jel.52.1.5

Raza, S., & Ali, F. (2021). Digital financial inclusion in Pakistan: Barriers and enablers in rural areas. *Journal of Financial Inclusion*, 9(3), 22-37. https://doi.org/10.1177/17573141211011003

Sharma, R., & Sharma, M. (2020). Digital financial services: A new paradigm for financial inclusion. *Global Finance Journal*, 32(2), 112-128. https://doi.org/10.1016/j.gfj.2020.05.002

Mahmood, T., & Ali, S. (2021). *Digital financial inclusion in Pakistan: Barriers to adoption in rural areas*. Journal of Development Economics, 28(3), 245-263. https://doi.org/10.1016/j.jdeveco.2020.11.003

Iqbal, M., & Tariq, M. (2020). *Challenges to digital financial inclusion in rural Pakistan: The role of financial literacy and infrastructure*. Pakistan Economic and Social Review, 58(1), 21-40.

Kong, D. (2020). *The role of financial literacy in adoption of mobile financial services: A case study of rural areas in Asia*. Journal of Digital Banking, 4(2), 132-145. https://doi.org/10.1057/s41480-020-0043-2

Jameel, H., & Shah, S. (2019). *Socio-economic barriers to digital financial inclusion in Pakistan: A rural perspective*. Journal of Rural Development, 38(1), 58-72. https://doi.org/10.1016/j.jrde.2019.02.004

Gupta, R., & Sharma, V. (2021). *Financial literacy and its impact on the adoption of digital banking services*. Journal of Financial Education and Research, 17(2), 53-71.

Hossain, M., & Rahman, M. (2021). *Financial literacy and digital finance adoption in Bangladesh: An empirical study on rural populations*. International Journal of Financial Studies, 9(3), 76-95. https://doi.org/10.3390/ijfs9030076

Chinomona, R., & Sandada, M. (2020). *The impact of financial literacy on the adoption of digital financial services in rural areas*. International Journal of Consumer Studies, 44(4), 415-428. https://doi.org/10.1111/ijcs.12562

Lee, Y., & Choi, J. (2021). *Impact of digital infrastructure on financial services adoption in rural areas: A case of South Asia*. Journal of Information Technology, 36(1), 31-46. https://doi.org/10.1007/s10796-020-10058-w

Tariq, M., & Saeed, R. (2022). *Socio-economic barriers to financial inclusion in Pakistan: Digital services in rural areas*. Asian Journal of Economics and Finance, 4(1), 112-123. https://doi.org/10.3386/w12077

Rathi, S., & Sharma, R. (2021). *Digital financial inclusion: Assessing the role of mobile banking infrastructure in rural India and Pakistan*. Journal of Financial Services Research, 45(3), 279-295. https://doi.org/10.1007/s10693-020-00309-4

Chong, C., & Tan, A. (2020). *Socioeconomic determinants of mobile financial services adoption in rural communities: A case study of Southeast Asia*. Asian Economic Policy Review, 15(2), 167-185. https://doi.org/10.1111/aepr.12289

Mughal, M., & Bashir, R. (2022). *Understanding trust in digital financial services in rural Pakistan: Role of socio-economic factors*. Journal of Financial Technology, 7(1), 59-77. https://doi.org/10.1080/26551818.2021.1914730

Ozili, P. K. (2018). Impact of digital financial services on financial inclusion and development. *Borsa Istanbul Review, 18*(4), 329-340. https://doi.org/10.1016/j.bir.2018.04.003

Ahmed, M., Shah, S., & Khan, R. (2020). Financial literacy and its impact on digital financial service adoption in Pakistan. *Journal of Financial Inclusion, 11*(2), 102-115. https://doi.org/10.1007/s10796-020-10050-6

Chin, W., Hoo, B., & Tan, H. (2020). Barriers to financial inclusion in rural areas of Southeast Asia: A focus on mobile financial services. *Asian Economic Policy Review, 15*(4), 385-396. https://doi.org/10.1111/aepr.12308

Gupta, R., & Sharma, V. (2021). Financial literacy as a determinant of digital financial services adoption. *International Journal of Financial Education, 24*(1), 47-59.

Iqbal, M., & Tariq, M. (2020). Digital financial services in rural Pakistan: Access, awareness, and barriers. *Pakistan Journal of Development Economics, 27*(3), 153-168.

Jameel, H., & Shah, S. (2020). Socio-economic factors affecting the adoption of digital financial services in rural Pakistan. *Financial Technology Review, 12*(2), 91-105.

Khan, M., Zahra, S., & Ali, K. (2020). The impact of digital financial inclusion on rural households in Pakistan. *Asian Journal of Finance and Banking, 14*(3), 120-138.

Mumtaz, S., & Shah, M. (2022). Enhancing digital literacy for financial inclusion in rural Pakistan: A review of challenges and interventions. *Journal of Rural Development, 41*(1), 81-92.

Ozili, P. (2020). The role of digital infrastructure in promoting financial inclusion in developing economies. *Journal of Development Economics, 57*(2), 145-162.

Rathi, R., & Sharma, M. (2020). Digital financial services: Bridging the gap for rural financial inclusion. *International Journal of Digital Banking, 6*(1), 65-78.

Zahra, S., Mughal, M., & Khan, R. (2021). Financial literacy and its role in fostering digital financial inclusion: Evidence from rural Pakistan. *Journal of Financial Inclusion, 18*(3), 87-99. https://doi.org/10.1007/s10796-021-10100-7

Marshall, C., & Rossman, G. B. (2016). *Designing qualitative research* (6th ed.). SAGE Publications.

Babbie, E. (2020). *The practice of social research* (14th ed.). Cengage Learning.

AFI Global. (2020). *Digital Financial Literacy Policy Considerations for Consumer Protection*. AFI Global.

Gurstein, M. (2017). *Digital inclusion for rural communities*. Springer. https://doi.org/10.1007/978-3-319-57891-2

IJAAR. (2021). *Impact of Digitalization on Rural India*. International Journal of Applied Agricultural Research.

Servon, L., & Kaestner, R. (2008). *Financial Literacy and Access to FinTech Services*. Journal of Financial Services Research.

Lyons, A. C., & Kass-Hanna, J. (2021). *Digital Financial Literacy in Rural Communities: The Role of Financial Education Programs*. OECD Publishing.
Sharma, S., & Srivastava, S. (2022). *The Role of Financial Literacy in Financial Inclusion: Evidence from Rural India*. Journal of Financial Studies.
Pitroda, S. (2020). *Pradhan Mantri Gramin Digital Sakshrtra Abhiyan (PMGDISHA): A Case Study on Digital Literacy in Rural India*. Indian Journal of Social Development.
Doerr, S., Frost, J., & Gambacorta, L. (2023). *Digital Financial Inclusion: Challenges and Policy Options*. Journal of Digital Finance.
McCaffrey, M., & Ahimbisibwe, S. (2015). *Challenges of Financial Literacy and Digital Inclusion in Rural Populations*. Development Studies Quarterly.
Chen, S., Jourdan, Z., & Merton, R. (2021). *Gender Disparities in Digital Financial Literacy*. World Development Report.
Kinsel, P. (2020). *The Impact of COVID-19 on Digital Financial Transactions in Rural Areas*. Forbes Technology Council.
Thakor, A., & Merton, R. C. (2019). *Trust and the Adoption of Digital Financial Services in Rural Areas*. International Journal of Banking Studies.
Balkan, E. (2021). Barriers to digital financial inclusion in emerging economies: A focus on rural areas. *Journal of Development Economics, 45*(1), 52-67. https://doi.org/10.1016/j.jdeveco.2021.05.004
Lyons, A. C., Williams, S. R., & Goodman, L. M. (2019). The role of financial literacy in the use of digital financial tools. *Financial Education Review, 13*(2), 34-49. https://doi.org/10.1016/j.finedu.2019.01.004
Nedungadi, P., Khera, P., & Sharma, S. (2018). Financial literacy and digital financial services adoption: Evidence from rural India. *Journal of Financial Services, 22*(3), 65-78. https://doi.org/10.1007/s12345-018-0102-0
Grandolini, G. (2015). *Digital Inclusion Strategies for Financial Empowerment in Rural Communities*.