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Digital Financial Services (DFS) and Women's Economic Empowerment: Insights from the Indian Mid-Himalayas

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Abstract: In the twenty-first century, Digital Financial Services (DFS) have emerged as a transformative force in bridging the gap in gender and financial inclusion, serving as a promoter of women's economic empowerment. The present study is an attempt to examine that what are the effects of DFS on economic empowerment (financial inclusion, financial literacy and economic autonomy). Drawing data from primary sources, the study highlights how digital platforms have enabled women in the study region to overcome traditional barriers to financial inclusion. The key findings reveal that these platforms not only enhance women's economic ability but also empower them. However, constraints such as low digital literacy remain critical obstacles. The effective role of DFS will be instrumental in unlocking economic potential and promoting inclusive growth and sustainable development. This paper contributes by emphasizing the critical role of DFS in addressing gender inequality and advancing the economic empowerment of women.

Keywords: Digital Financial Services, Women's Economic Empowerment, Financial Inclusion.

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INTRODUCTION

In recent years the revolution by Digital Financial Services (DFS) has changed the global financial landscape by offering innovative solutions for addressing the long-standing barriers to the financial inclusion. For their delivery and utilization by consumers these financial services generally rely on digital technologies [1] i.e., mobile phones, the internet and fintech applications. By this platform the users are enable to access various services which includes banking, payments, savings, credit, insurance etc. with extraordinary proficiency which is called 'the internet economy' [2]. The rise of this revolution through digital technology has been a game changer particularly in emerging and developing economies where traditional infrastructure has less access to reach marginalised populations for financial inclusion. This method allows seamless transaction to individuals and business across all parties [3]. For inclusion of gender equality this can be a powerful lever, and parallelly also be able to raise economic growth, equality in income and stability in finance [4].

In the developing emerging economies gender gap and financial inclusion remains a significant issue globally specially from the rural areas where a number of barriers hinder them from accessing these services at financial institutions [5]. The three main categories which act as barriers are not having access to essential

needs for financial inclusion, not having equal laws and regulations and insufficient digital financial infrastructure [6]. In India nearly 20 percent women remain without access to a bank account [7] and nearly 54 percent of Indian women still face challenges in accessing basic banking services due to social and cultural factors [8]. The gender gap in financial inclusion is influenced by multiple factors i.e., cultural barriers, lack of documentation, limited financial literacy, mobility constraints, income disparities etc. and particularly access to mobile phones also impact the financial inclusion [9].

However, DFS have emerged as a transformative tool to address this gap by offering women to participate more effectively in the financial ecosystem because this digital system of finance offers innovative solutions to address the barriers by overcoming documentation barriers, enhancing privacy and control, cost-effectiveness, accessibility etc. If the DFS grows with pace then it has ability to change the landscape of women's financial inclusion [10]. The GSMA report shows that around 60 percent of Indian women now own a smartphone and the report of NPCI shows that digital transactions by rural women have increased by 22 percent over past two years [11]. DFS have very much potential to bridge the gap of gender in financial inclusion as a game changer for them by getting them empowered economically and make them able to

enhance their contribution to household welfare and economic development more effectively.

The need of the present study is to find the relation between DFS and women's empowerment in the study region where both urban and rural landscapes present unique challenges and opportunities. In study region Uttarakhand, where women play a key role in sustaining local economies, empowering them through DFS can have multiplier effect on the regions overall economic growth. In this study, we examined the impact of DFS on their economic habits and decision-making power.

RESEARCH OBJECTIVES

- To study the accessibility of Digital Financial Services (DFS) among respondent women.
- To study the contribution of Digital Financial Services (DFS) to economic empowerment (income generation, savings, investment, etc.) of respondent women.

LITERATURE REVIEW

Riza & Wijayanti (2021) [12] in their research work focused on digital banking etc. to study the women economic empowerment by 'KARTINI programme' in Indonesia and they finally concluded that by integrating smart behaviour programmes, e-commerce and affiliate marketing, women can get benefit to increase their knowledge and understanding related to financial inclusion. The Kartini programme is helpful in providing financial education to women which is one of the six pillars of national strategy for financial inclusion.

Chatterjee (2021) [13] in her study namely "Women's Financial Inclusion in Digital India: Need for Gender Thrust" she suggests policy recommendations and best practices to integrate women into formal finance in the age of digitalization. She recommends that there is a need for stronger gender thrust on PMJDY scheme, gender disaggregated data on digital financial inclusion, by considering the woman needs implementation of better products and product design in DFS and finally, she recommends for contextual training for women to include them under the umbrella of this modern digital technique.

Nela *et al.* (2022) [14] conducted the study namely "The Influence of the Digital Economy and Women's Empowerment on the Family Economy" was conducted on ninety-seven respondents and they concluded in their study that the digital economy has put significant impact and women empowerment has also a good and considerable impact in the economy of family. She concludes that digital economy have make a significant and positive influence on empowerment of women.

Ruchi (2023) [15] analysed in her research that there is nuanced impact of digital technologies on women's access to DFS and participation in economic activities. The findings highlight that while digital transformation holds promise for enhancing women's agency and autonomy, challenges related to the digital divide, access barriers, and gender norms persist. The study provides valuable information that helps us better understand how technology, microfinance, and women's empowerment are connected and affect each other.

Heath & Riley (2024) [16] in their study find that use of mobile money services has increased the control of the finance of women as well as it also has increased their decision making in the household. Without changing in the total household income or spending the expenditure shares of a household has been shifted to be more aligned with women's preference. So, they conclude that this can be an effective tool for empowering the women by giving them greater control over their money.

Mishra *et al.* (2024) [17], found that financial literacy plays an important role in connecting women's empowerment and green microfinance. They argued that not having financial knowledge greatly restricts women from being able to utilize new technologies. They recommend that digital literacy programs must be specifically targeted to women to help them become skilled and knowledgeable about digital financial services (DFS). Thus, this could enable policymakers to widen women's entry into the digital environment.

Khare *et al.* (2024) [18] in their study concluded that this put positive effect on their empowerment. They find that digital financial services help women become more financially independent, make their own decisions, and improve their social status. They also find that the growth of Digital Financial Inclusion is rapid in urban and average in rural. For which they reiterate the importance of addressing the barriers to their Digital Financial Inclusion.

Dasgupta *et al.* (2024) [19] highlighted the factors that are affecting the digital financial inclusion of women leading to their empowerment. The study was conducted in Kolkata and they found that there is a strong and positive correlation between attitude and behaviour intention and both trust and perceived security, and this suggests that high level of trust and perceived security result as good attitude and higher level of behaviour intention to utilize e-payment. They find DFI as a big potential for women's inclusion.

Agrawal *et al.* (2024) [20] finds that limited access to formal financial services hinder their economic empowerment, digital gender divide is also found to access in smartphones and internet, lack of financial literacy among women makes challenging to use these tools effectively, traditional credit scoring models

excluding them from getting credit opportunities etc. They suggest NGOs participation for financial literacy programmes, Supportive regulatory environment by government, creation of more innovative Apps to navigate them financial services and training programmes for teaching them digital skills to empower them.

Nikhila (2024) [21] concluded in her research that empowering women in her study region through literacy of digital finance is a crucial tactic that will attain gender equality and sustainable development. When government organizations and community leaders provide women with knowledge, it helps them take charge of their financial futures. This creates a strong community where women's voices are heard and their rights are respected.

The previous studies which were adopted as literature review collectively conclude that DFS enhance the economic empowerment of women by improving the household financial control, improving financial literacy, social status, and all above the decision-making power. Digital divide, lack of financial literacy, gender norms etc. are such type of barriers that persist, by highlighting the need for targeted intervention which include gender focused policies, innovative user-friendly apps etc. can make DFS revolutionary in women's economic empowerment. In study area, exploring the region-specific strategy for enhancing digital literacy and inclusion tailored to hilly terrain remains unresearched and this study is an attempt to fill the gap.

MATERIAL AND METHODS

- **Study Area:** The study area is situated in Indian Mid Himalayan region namely State of Uttarakhand which is predominantly a hilly state, where more than 80 percent of its geographical area characterised by mountainous terrain and a small fraction consisting of plains.
- **Sample Design:** As the respondents are targeted (only those women who know to access the digital payment platform i.e., mobile banking, ATM services, UPI etc.) so convenience sampling is adopted to select the respondents.
- **Sample Size and Collection of Data:** For the present study a well-structured questionnaire was framed and was distributed to the target respondents through google-form format with the help of e-mail and messaging platform. 110 questionnaires distributed to the targeted respondents and 101 respondents (91.81 percent) responded to the questionnaire. A higher representation of urban participation in the dataset was found.
- **Variables:** Economic Empowerment of women is dependent variable in the present study.

- **Statistical Tools Used:** Mean, Std. Deviation, Pearson Correlation and ANNOVA were main statistical tools used in present analysis.
- **Limitations:** The study is limited to only women who use digital platform for any money transaction (i.e., Mobile Banking, UPI, ATM etc.) in Uttarakhand state.

RESULTS

Socio-Economic Profile

SES means a person's position in a within a hierarchical social structure [22]. It's not just about someone encompasses income; it also includes how people feel about their social class and status, as well as their financial success and security [23]. The socio-economic profile of the respondents shows that the respondents are relatively young (Mean Age = 31.24) and have a high level of education among them. The education qualification (in number of schooling years) shows that the minimum qualified respondents belong to 12 years completed in school education. Average income of the respondents is Rs. 15,960.00 per month as they are Employed in Government/Private sector or they are engaged in self-employment activities. The status of marital status among respondents shows that a large proportion is consist of married (52.48 percent), followed by single individuals (41.58 percent).

Access and Usage of DFS

- Number of DFS Services use** – Mobile payments and digital wallets, have made smartphones gateways to financial freedom for women [24]. In the study region highest frequency for using Digital Financial Services is for only one service (37.62 percent) followed and least is for all services (1.98 percent). UPI is mostly used DFS among them (76.23 percent) followed by ATM service (59.40) and Mobile banking services (52.47 percent). The correlational analysis between the DFS services used shows that there is significant large positive relationship between Income and No. of DFS Service use, ($r(99) = .592, p < .001$). This means there is a strong positive relationship between income and the number of Digital Financial Services (DFS) used. As income increases, the number of DFS services used by respondents also tends to increase.
- Activities used by respondents under DFS** – Among six identified activities 75.25 percent respondents responded online shopping activity as highest followed by Money Transfer (74.26 percent), Bill Payment (63.37 percent) among the respondents in study area.
- Learning of DFS Services** – Most of the respondents responded that they learn using DFS by self-taught (69.30 percent) and the second mode for their learning DFS is through family or friends (40.59 percent). Results of the Pearson correlation indicated that there is a non-significant very small

positive relationship between Education and DFS Learning, ($r = .0405$, $p = .687$). So, education (in

years) appears to have no meaningful impact on how individuals learn to use DFS.

Table 1: Correlational Analysis of access and usage of DFS

Pearson Correlation (r)	r ²	p-value	Covariance	n	Statistic
Income & DFS Services used					
0.5922	0.3507	6.901e-11	19742.4752	101	7.3125
Education & DFS Learning					
0.04054	0.001643	0.6873	0.02881	101	0.4037

Source: Primary Data (N=101)

Economic Empowerment Status using DFS

Digital Financial Services has the potential to put in the hands of women the means to better carry out their roles [25]. To find out the economic empowerment through Digital Financial Services seven question were framed in the questionnaire regarding feeling financially independency, able to save more money, making financial decision on her own, help in income generating activity, help in making investments or planning for future financial needs, reduction on dependency on others for managing money and feeling empowered to manage household finances through digital financial

services. 96.04 percent of respondents feel more financially independent followed by 87.13 were able to make financial decision on their own, 83.17 percent feel empowered to manage household decisions while only 52.48 percent respondents feel that DFS helped them in any income generating economic activity.

Table 2 reveals that 68.32 percent women have gained high economic empowerment after using DFS in study area, only a few (9.90 percent) are low economic empowered even after using any Digital Financial Service (DFS).

Table 2: Composite Index for Women's Economic Empowerment through DFS

Status of Economic Empowerment	Respondents % age
High (0.67-1.00)	68.32
Medium (0.34-0.66)	21.78
Low (0.00-0.33)	9.90

Source: Primary data (N=101)

To know whether there is significant difference in the means of Economic Empowerment Index across the three income groups (i.e., Low-income group,

Medium-income group & High-income group) among the respondents in the study region ANNOVA is used.

Source	Degrees of Freedom	Sum of Squares	Mean Square	F-Stat	P-value
Between Groups	2	0.6233	0.3116	6.1711	0.00299
Within Groups	98	4.9491	0.0505		
Total	100	5.5723	0.05572		

The ANNOVA result shows that p-value ($p=0.00299$) < Common Significance level ($\alpha=0.05$) which means that there are significant differences between the means of the groups.

CONCLUSION

The above analysis highlights that among respondents the use of only one service reflects a limited diversification in the use of DFS, which indicates towards lack of awareness, accessibility, or trust in certain services. The predominance of UPI service demonstrates to widely accessible platform and convenience of this mode of DFS which is simple, cost-effective and integration into everyday financial transactions. How the economic capacity play role in engagement with DFS shows that as the income increases, more disposable income is used to explore DFS by the respondents. This aligns with studies that

emphasize income as a critical determinant of financial inclusion.

The top three activities shows that the consumer behaviour is growing for leveraging digital tools for their convenience and efficiency. Increasing penetration of e-commerce platforms is showed by the online shopping activity, the reflection of DFS utility in study area among respondents is showed by money transfer which is the second most common activity. The analysis shows that use of DFS depends on experiential learning or support from social networks. Majority of women reported high economic empowerment and experienced enhanced financial independence, increase in confidence for making financial decisions, and experienced the better

management of household finances but still some barriers hinder the effective utilization of DFS for all respondents. The ANNOVA results indicates that the degree of economic empowerment is associated with income levels and women from higher income groups may have better access to resources.

It is suggested that the awareness for the benefits of use of multiple services under DFS specially among low-income groups, financial institutions promote inclusivity and build trust in DFS services. For diverse demographic groups user friendly interfaces should be developed and a need for invest in digital infrastructure so that it ensures seamless transaction specially in remote hilly regions where internet connectivity is an issue which may limit the usage of DFS. The accessible training programmes and workshops should be conducted through financial institutions so that they target the varying education levels to educate for DFS services. It can also be done through guided tutorial or gamified learning modules to enhance their self-learning. Finally, focused training, customised financial products and bridging the awareness gap can help in widening the role of DFS.

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