



# BUSINESS OPPORTUNITIES IN DEVELOPING DIGITAL FINANCIAL SERVICES FOR SMALL HOLDER FARMERS



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Study developed by:



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# Content index

|                                                                                             |           |
|---------------------------------------------------------------------------------------------|-----------|
| <b>Abbreviations.....</b>                                                                   | <b>4</b>  |
| <b>01: Project background and introduction.....</b>                                         | <b>5</b>  |
| <b>02: Executive Summary.....</b>                                                           | <b>6</b>  |
| <b>03: Introduction.....</b>                                                                | <b>9</b>  |
| 03.01: Background and the Rationales of the Study.....                                      | 9         |
| 03.02: Purpose and Objectives of the Study.....                                             | 11        |
| 03.03: Scope of Work.....                                                                   | 13        |
| 03.04: Understanding of the Assignment.....                                                 | 14        |
| 03.05: Macroeconomic Performances and Agricultural Productivity in Ethiopia.....            | 15        |
| 03.06: Digital Financial Services in Ethiopia: Context and Existing Situation.....          | 17        |
| 03.07: Policy and Legal Frameworks.....                                                     | 18        |
| 03.08: Limitations.....                                                                     | 20        |
| <b>04: Review of Literature.....</b>                                                        | <b>21</b> |
| 04.01: Context and Theoretical Underpinnings in Digital Financial Services.....             | 21        |
| 04.02: Conceptualizing Digital Financial Services (DFS) for Smallholder Farmers (SHFs)..... | 25        |
| 04.03: A Conceptual Framework for the Assignment.....                                       | 26        |
| 04.04: Opportunities and Challenges of DFS.....                                             | 27        |
| 04.05: Countries Experiences at a Glance.....                                               | 29        |
| <b>05: Technical Approach and Mehodology.....</b>                                           | <b>35</b> |
| 05.01: Approaches followed.....                                                             | 35        |
| 05.02: Materials and methods.....                                                           | 37        |
| 05.03: Qualitative and Quantitative Data Analysis.....                                      | 48        |
| 05.04: Data Quality Assurance.....                                                          | 48        |
| 05.05: A summary of materials and methods.....                                              | 48        |
| <b>06: Result and Discussion.....</b>                                                       | <b>52</b> |
| 06.01: Descriptive statistics /Background.....                                              | 52        |
| 06.02: DFS Adoption and Usage Patterns.....                                                 | 57        |
| 06.03: Respondent's Perception on usage and experience of DFS.....                          | 65        |
| 06.04: Key factors influencing adoption and usage of DFS.....                               | 67        |
| 06.05: Mapping the Value Chain and Key Actors.....                                          | 71        |
| 06.06: State of DFS and business opportunities.....                                         | 74        |
| 06.07: State of DFS.....                                                                    | 74        |
| 06.08: Impact on Financial Inclusion.....                                                   | 91        |
| 06.09: Impact on Agricultural Productivity.....                                             | 96        |
| 06.10: Implications and Opportunities of Farm Size.....                                     | 97        |

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|                                                                                           |            |
|-------------------------------------------------------------------------------------------|------------|
| 06.11: Future Farming Activities and DFS.....                                             | 100        |
| 06.12: DFS and Farmers livelihood.....                                                    | 101        |
| 06.13: Comparative Analysis.....                                                          | 104        |
| 06.14: Ethiopia Vs Kenya.....                                                             | 105        |
| 06.15: Ethiopia Vs Ghana.....                                                             | 106        |
| 06.16: Ethiopia Vs India.....                                                             | 108        |
| 06.17: Ethiopia Vs Bangladesh.....                                                        | 109        |
| 06.18: Comparative Analysis: Summary.....                                                 | 110        |
| 06.19: Challenges and Barriers.....                                                       | 112        |
| 06.20: Access to DFS for Smallholder Farmers in Ethiopia: Is It a Hard Nut to Crack?..... | 117        |
| 06.21: Practical Recommendations.....                                                     | 118        |
| <b>07: Conclusion and Recommendations.....</b>                                            | <b>123</b> |
| 07.01: Conclusion.....                                                                    | 123        |
| 07.02: Policy implications.....                                                           | 124        |
| <b>08: References.....</b>                                                                | <b>127</b> |
| <b>09: Annexes.....</b>                                                                   | <b>130</b> |
| <b>10: Contact details.....</b>                                                           | <b>138</b> |

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## Abbreviations

|        |                                                           |
|--------|-----------------------------------------------------------|
| AACCSA | Addis Ababa Chamber of Commerce and Sectoral Associations |
| AAU    | Addis Ababa University                                    |
| ATA    | Agriculture Transformation 139Agency                      |
| ATM    | Automated Teller Machine                                  |
| BIC    | Business Innovation Center                                |
| DFS    | Digital Financial Services                                |
| CBE    | Commercial Bank of Ethiopia                               |
| DBT    | Direct Benefit Transfer                                   |
| ESG    | Environmental, Social, and Governance                     |
| FGD    | Focus Group Discussion                                    |
| GDP    | Gross Domestic Product                                    |
| ICT    | Information and Communication Technology                  |
| IOD-E  | Institute of Directors – Ethiopia                         |
| KCC    | Kisan Credit Card                                         |
| MFIs   | Microfinance institutions                                 |
| MSME   | Micro, small, and medium-sized (MSME)                     |
| NBE    | National Bank of Ethiopia                                 |
| NGO    | Non-Governmental Organization                             |
| PLC    | Public Limited Company                                    |
| POS    | Point on Sale                                             |
| SDG    | Sustainable Development Goal                              |
| SHF    | Small Holders Farmers                                     |
| SMEs   | Small and Medium-sized Enterprises                        |
| SWE    | South West Ethiopia                                       |
| TAM    | Technology Acceptance Model                               |
| ToR    | Terms of Reference                                        |
| USSD   | Unstructured Supplementary Service Data                   |

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## 01: Project background and introduction

BIC Ethiopia targets strengthening the incubation ecosystem for entrepreneurs and micro, small and medium-sized enterprises (MSMEs) active in agri-tech and agri-business in Ethiopia. Key challenges addressed are sustainability of business models for incubators, quality of business support services, availability of services outside Addis Ababa, access to finance for MSMEs and strengthening the relevant regulative framework supporting start-ups. There is a specific focus to expand services beyond Addis Ababa to also cover secondary cities and rural Ethiopia to support geographically inclusive growth.

The project aims to address these bottlenecks in the Ethiopian startup ecosystem by working with fifteen (15) selected existing and newly established incubators and by supporting them in developing sustainable and technically sound business models. The incubators are thus enabled to better support start-ups and MSMEs in agricultural technology and agribusiness to improve market access, generate higher incomes and create jobs.

The action is implemented by a consortium of five organisations, led by sequa gGmbH, a German non-profit specialist in private sector development in low-income markets, active internationally since 1991 and in Ethiopia since 2002. The Addis Chamber of Commerce and Sectoral Associations capitalises on its reach-out to 50,000 SME members and its experience to shape national policies in favour of the private sector. adelphi gGmbH and GrowthAfrica Foundation contribute their vast experience in curriculum development towards start-ups, entrepreneurs, the capacity building of incubation hubs and acceleration programmes, and access to finance strategies. icehawassa, a national grassroots innovation centre, and the Ethiopia-focused foundation Menschen für Menschen (MfM) establish, expand, and manage incubation centres in the southern and northern regions.

BIC Ethiopia also works with the Ethiopian Association of Startup Ecosystem (EASE) and the regional network BIC Africa. The former is currently being established by private, academic, and non-profit incubators to serve as a network and discussion forum for incubation centres in Ethiopia, while the latter is a regional network supporting business incubators in Africa to excel and spark a wide impact in society.

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## 02: Executive Summary

This study aims to explore, identify, and analyses business opportunities within the digital financial services sector, particularly focusing on empowering young entrepreneurs to create innovative solutions tailored to the needs of smallholder farmers. This overarching objective is divided into four interrelated specific goals.

Globally and locally, there is a growing trend towards adopting innovative financial services tailored to the specific needs of smallholder farmers in the agriculture and agro-processing sectors. Smallholder farmers are crucial for sustaining food security and driving economic development, especially in Ethiopia, where agriculture is a primary livelihood source for a significant portion of the population. However, many smallholder farmers face challenges in accessing financial services, which limits their ability to invest in productive activities, adopt modern agricultural practices, and mitigate risks.

Given these challenges, there is a strong rationale for exploring the feasibility and potential of digital financial services for smallholder farmers. Digital financial services can overcome barriers such as geographical distance, lack of physical infrastructure, and limited financial literacy by providing convenient and accessible solutions through digital platforms. Leveraging technologies such as mobile money, digital wallets, and block chain, digital financial services can facilitate financial inclusion, improve access to credit, enable efficient payment systems, and enhance overall agricultural productivity and resilience.

This study critically examines the usage, access, and impact of Digital Financial Services (DFS) among smallholder farmers, with a focus on identifying the key factors that influence the adoption of DFS in rural areas. A mixed-methods research approach was employed, comprising a comprehensive literature review, key informant interviews, surveys, and document analysis. The findings provide substantial insights into the levels of mobile phone ownership, digital literacy, trust in digital platforms, and infrastructural challenges that shape the adoption and utilization of DFS.

The data reveal that a significant majority of respondents (85.9%, n=134) own mobile phones, although there is notable variation in the types of devices used. Specifically, 37% (n=58) of respondent's own smartphones, while 30% (n=47) possess feature phones with limited internet functionality, and 32% (n=51) use basic phones that support only voice calls and SMS services. Notably, 53.8% (n=84) of mobile phone owners lack internet access, underscoring a digital divide, with only 44.2% (n=69) relying on mobile data and a mere 1.9% (n=3) utilizing Wi-Fi.

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These findings emphasize the persistent connectivity challenges, which hinder the widespread adoption of DFS, especially in rural settings.

The research identifies several critical barriers to DFS adoption, including low levels of digital and financial literacy, limited trust in digital platforms, and inadequate infrastructure, particularly in terms of reliable internet and mobile network access. These factors significantly impede the effective usage of DFS, particularly among marginalized and underserved communities. Therefore, addressing these barriers requires targeted interventions aimed at improving both digital and financial literacy, expanding mobile network coverage, and fostering greater trust in digital platforms. Such measures would enhance the adoption, usage, and impact of DFS in rural and underserved regions.

In terms of impact, DFS has been shown to contribute significantly to the livelihoods of farmers, particularly by improving financial inclusion. Farmers have gained enhanced access to essential financial services, such as credit, savings, and microinsurance, as well as more convenient and secure means of conducting transactions. Furthermore, DFS has facilitated better access to markets and increased overall efficiency in agricultural activities. However, the study highlights gaps in the provision of financial literacy and access to more sophisticated financial products, such as microinsurance, which, if addressed, could further enhance the role of DFS in fostering rural economic growth and development.

A notable finding is the strong interest expressed by respondents in receiving further training on DFS, with 72.4% (n=113) indicating a desire for additional education on how to use these services effectively. This highlights the critical need for capacity-building initiatives that target digital and financial literacy, which are essential for maximizing the benefits of DFS. Offering comprehensive training and ongoing support to users would significantly enhance engagement, improve trust in digital platforms, and address the current knowledge gaps.

In terms of comparative analysis, Kenya and India stand out as leaders in DFS adoption, with Kenya's extensive use of mobile money platforms such as M-Pesa and India's broad range of DFS solutions demonstrating significant advancements in financial inclusion and economic empowerment. Kenya's high adoption rates and comprehensive service offerings serve as a benchmark for DFS integration, while India's multifaceted approach, including government initiatives and diverse financial products, underscores the importance of robust digital infrastructure and regulatory support. In contrast, Ethiopia and Ghana are at earlier stages of DFS development. Ethiopia is making progress with emerging services like Telebirr and CBE Birr but faces challenges such as low digital literacy and limited infrastructure. Ghana shows moderate DFS adoption and impact but also contends with issues related to digital literacy and rural network coverage.

Bangladesh exemplifies success in integrating mobile money with microfinance, effectively reaching rural and underserved populations. However, it also faces challenges related to regulatory hurdles and interoperability. Across all countries, common barriers include resistance to change, inadequate infrastructure, and regulatory gaps. These challenges hinder the full potential of DFS and require targeted solutions to enhance service delivery and financial

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inclusion. Addressing these issues involves improving digital literacy, expanding infrastructure, and developing supportive regulatory frameworks. By leveraging successful models and tackling existing barriers, emerging markets like Ethiopia can build effective DFS ecosystems that meet the needs of diverse populations and contribute to sustainable economic growth.

In conclusion, the findings of this study underscore the transformative potential of DFS for improving financial inclusion and supporting rural economic development. However, for DFS to reach its full potential, there is a pressing need to address the infrastructural, educational, and trust-related challenges identified in the study. By implementing targeted interventions aimed at improving connectivity, expanding digital and financial literacy, and fostering greater trust in DFS platforms, stakeholders can enhance the adoption and impact of these services. Such efforts will be crucial in ensuring that DFS plays a pivotal role in promoting sustainable agricultural development and improving the livelihoods of smallholder farmers in rural areas.

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## 03: Introduction

Digital Financial Services (DFS) have emerged as a transformative force in the financial landscape, particularly in developing countries. For smallholder farmers, who form the backbone of the agricultural sector in Ethiopia, access to financial services is crucial for improving productivity, managing risks, and enhancing livelihoods (Abdulai et al., 2023; Deresse & Zerihun, 2018). Despite their importance, smallholder farmers often face significant barriers to accessing traditional financial services due to geographic, economic, and infrastructural constraints. DFS offers a promising solution to these challenges by providing a more accessible, efficient, and inclusive financial ecosystem (Anne Marie van Swinderen, 2017a; IFAD, 2016a). This section outlines the background, objectives, and scope of the study, and emphasizes the practices of Digital Financial Services (DFS) in Ethiopia.

### 03.01: Background and the Rationales of the Study

The Addis Ababa Chamber of Commerce and Sectoral Associations (AACCSA) was re-established by Proclamation Number 341/2003 as a voluntary business membership organization. With a mission to promote business and investment by providing demand-driven services to its members and advocating for a favorable business environment, AACCSA envisions being instrumental in the flourishing of vibrant and prosperous businesses in Ethiopia.

As part of its mandate, AACCSA actively engages in promoting trade and investment, disseminating business information, consulting with and engaging members and government on various economic development and business issues, supporting the business community through business-related training, advancing cooperation with other chambers of commerce, and conducting research in business and economic topics to effectively represent the interests and views of the private sector. Additionally, the Chamber has a commendable track record in offering arbitration services to businesses and operates the Institute of Directors - Ethiopia (IOD-E) with the intent to promote corporate governance and professionalize directors and boards in Ethiopia. Furthermore, in collaboration with other partners, AACCSA implements Environmental, Social, and Governance (ESG) programs. Being a member of the World Chambers Federation, AACCSA also maintains a prominent place in the international network of chambers.

In line with its objectives and to fulfill additional functions, AACCSA recently underwent a major restructuring and established additional units. One such unit is the Business Innovation Center (BIC), aimed at assisting entrepreneurs in developing their businesses and addressing associated challenges by providing a range of business and technical services, including training, advisory, networking, and linkages. To support the establishment and operationalization of the center, AACCSA agreed with SEQUA. As per the cooperation agreement, AACCSA's BIC is tasked with executing value chain opportunities studies.

Globally and locally, there is a noticeable trend towards the adoption of innovative financial services tailored to the specific needs of smallholder farmers in the agriculture and

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agro-processing sector. Smallholder farmers play a critical role in sustaining food security and economic development, particularly in Ethiopia, where agriculture is a primary source of livelihood for a significant portion of the population. However, access to financial services remains a challenge for many smallholder farmers, limiting their ability to invest in productive activities, adopt modern agricultural practices, and mitigate risks.

In light of these challenges, there is a compelling rationale for exploring the feasibility and potential of digital financial services for smallholder farmers. Digital financial services have the potential to overcome barriers such as geographical distance, lack of physical infrastructure, and limited financial literacy by providing convenient and accessible solutions through digital platforms. By leveraging technologies such as mobile money, digital wallets, and blockchain, digital financial services can facilitate financial inclusion, improve access to credit, enable efficient payment systems, and enhance agricultural productivity and resilience.

Digital Financial Services (DFS) have emerged as a transformative force in promoting financial inclusion, particularly in developing economies like Ethiopia. DFS encompasses a range of financial products and services that are delivered and accessed through digital platforms, such as mobile banking, electronic payments, and digital wallets. In countries where traditional banking infrastructure is limited or inaccessible to large portions of the population, DFS offers a viable alternative, enabling individuals and businesses to engage with the formal financial system using mobile phones or other digital devices.

In Ethiopia, where over 80% of the population resides in rural areas and agricultural activities dominate the economy, access to financial services has historically been limited. Smallholder farmers, who form the backbone of the agricultural sector, often face significant challenges when it comes to accessing credit, savings, and insurance products, which are essential for improving productivity and managing risk. Traditional banking systems are concentrated in urban areas, leaving millions of rural Ethiopians without the means to benefit from formal financial services.

The introduction of DFS in Ethiopia is viewed as a key solution to bridging this gap. With the rapid growth of mobile phone penetration, fintech innovations, and government efforts to promote financial inclusion, DFS platforms are increasingly seen as a way to provide cost-effective, secure, and convenient financial services to underserved populations. Mobile money services, in particular, have gained traction, with platforms such as Telebirr facilitating millions of transactions and allowing users to save, send money, pay bills, and even access credit using their mobile phones.

Despite this progress, the uptake of DFS in Ethiopia faces numerous challenges. Limited digital infrastructure, especially in rural areas, low levels of digital literacy, and a cultural preference for cash transactions have hindered the widespread adoption of DFS. Additionally, regulatory frameworks are still evolving, which impacts the growth and development of DFS providers and platforms.

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The role of DFS in the agricultural sector is particularly important, as smallholder farmers can benefit from digital financial products tailored to their needs. These products could provide better access to credit for purchasing inputs, insurance to protect against crop losses, and direct connections to markets. However, understanding the specific needs and behaviors of smallholder farmers is crucial for designing DFS solutions that will see high levels of adoption and usage.

Therefore, this study aims to investigate the viability, opportunities, and challenges associated with developing digital financial services tailored to the unique needs of smallholder farmers in Ethiopia. By conducting a comprehensive analysis, the study seeks to generate valuable insights, recommendations, and actionable strategies that can inform policymakers, financial institutions, development agencies, and entrepreneurs interested in entering the digital financial services space. Ultimately, the findings of this study are expected to contribute to the development of innovative and inclusive financial solutions that empower smallholder farmers, promote sustainable agricultural development, and foster economic growth in Ethiopia.

## 03.02: Purpose and Objectives of the Study

The purpose of the assignment is to conduct a comprehensive study on the development of digital financial services for smallholder farmers in Ethiopia. The study aims to explore, identify, and analyze business opportunities within the digital financial services sector, with a specific focus on empowering young entrepreneurs to create innovative solutions tailored to the needs of smallholder farmers. Additionally, the study seeks to provide an overview of the agriculture sector, highlighting the role of digital financial services in enhancing financial inclusion and supporting the economic growth of smallholder farmers.

### General Objectives:

- Explore and Identify Business Opportunities: Conduct a thorough exploration to identify potential business opportunities in the development of digital financial services for smallholder farmers. The study aims to provide valuable information to young innovators in this sector, enabling them to capitalize on emerging opportunities.
- Provide an Overview of the Agriculture Sector: Offer a comprehensive overview of the agriculture sector in Ethiopia, emphasizing the importance of digital financial services in enhancing financial inclusion and supporting the livelihoods of smallholder farmers.
- Highlight the Importance of a Comprehensive Study: Emphasize the significance of conducting a comprehensive study to explore opportunities within the digital financial services sector. The study aims to empower young entrepreneurs by providing insights and recommendations for creating innovative solutions for smallholder farmers.

### Specific Objectives:

- Conduct Value Chain Analysis: Undertake an extensive study of the value chain associated with digital financial services for smallholder farmers. This analysis

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considers technological aspects, financial products, and user experience to identify critical components and potential areas for improvement.

- **Identify and Analyse Business Opportunities:** Identify and analyze specific business opportunities within the digital financial services industry, with a strategic focus on creating pathways for young entrepreneurs. The analysis considers the financial needs and challenges of smallholder farmers to develop targeted solutions.
- **Evaluate the Current State of Digital Financial Services:** Evaluate the current state of digital financial services for smallholder farmers in Ethiopia. This assessment focuses on sustainability, market trends, and the potential for entrepreneurial ventures to thrive in the sector.
- **Develop Practical Recommendations:** Develop practical recommendations and guidelines to assist young entrepreneurs in establishing startups within the digital financial services sector. These recommendations emphasize inclusivity, user-friendliness, and sustainability to ensure the success and scalability of entrepreneurial ventures.
- **Showcase Inspirational Success Stories:** Identify and showcase inspirational success stories from other African countries. These success stories serve as valuable examples and sources of inspiration for young entrepreneurs in Ethiopia, highlighting best practices and lessons learned in the development of digital financial services for smallholder farmers.

## Key Research Questions

The following research questions are designed to explore various aspects of digital financial services development, adoption, and impact on smallholder farmers in Ethiopia, providing valuable insights for policymakers, entrepreneurs, and other stakeholders.

- a. What are the specific financial needs and challenges faced by smallholder farmers in Ethiopia, and how can digital financial services address these needs?
- b. What are the current trends and innovations in digital financial services globally, and how can these be adapted to the Ethiopian context?
- c. What are the key components of the value chain associated with the development and implementation of digital financial services for smallholder farmers?
- d. What are the main barriers to accessing digital financial services for smallholder farmers, and how can these barriers be overcome?
- e. What are the attitudes, preferences, and behaviors of smallholder farmers towards digital financial services, and how to do these impact adoption and usage?
- f. What are the successful case studies of start-ups in the digital financial services sector globally, and what lessons can be learned from these examples?
- g. How do regulatory frameworks and policies affect the development and deployment of digital financial services for smallholder farmers in Ethiopia?
- h. What are the potential business opportunities for young entrepreneurs in the digital financial services sector, and how can these opportunities be capitalized on?

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- i. What are the critical success factors for start-ups in the digital financial services sector, and how can these be leveraged to ensure sustainability and growth?
- j. How can digital financial services contribute to enhancing financial inclusion, agricultural productivity, and economic empowerment for smallholder farmers in Ethiopia?

### 03.03: Scope of Work

The study focuses on smallholder farmers in Addis Ababa and the surrounding Sheger cities within the Oromia region. It examines the adoption and impact of DFS, including mobile money, digital credit, and other financial technologies that facilitate access to financial services. The scope includes an analysis of the existing DFS infrastructure, the role of various stakeholders, and the socio-economic factors influencing DFS adoption. The study encompasses both quantitative and qualitative data collection methods, including surveys, and key informant interviews, to provide a comprehensive understanding of the DFS landscape.

#### Box 1: Geographic, thematic, and time scope

##### Geographic Scope

The study was focused on smallholder farmers across Addis Ababa and Oromia region of Ethiopia. These areas are selected due to their significance in urban agricultural activities and the presence of diverse farming communities. The geographic scope ensures a comprehensive representation of the different climatic, economic, and cultural conditions affecting digital finance adoption among smallholder farmers.

##### Thematic Scope

**The study examined several key themes related to digital finance among smallholder farmers:**

- **Access to Digital Financial Services:** Exploring the availability and accessibility of digital financial platforms, including mobile banking, e-wallets, and other fintech solutions.
- **Usage Patterns:** Investigating how smallholder farmers utilize digital financial services for transactions, savings, loans, and insurance.
- **Impact on Agricultural Productivity:** Assessing the influence of digital finance on farm productivity, income levels, and economic resilience.

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- **Barriers to Adoption:** Identifying challenges faced by smallholder farmers in adopting digital financial services, such as literacy, technological infrastructure, and trust issues.
- **Stakeholder Engagement:** Evaluating the role of various stakeholders, including government agencies, financial institutions, and non-governmental organizations, in promoting and supporting digital financial services.

### Time Scope

The study covered a period of five years, from 2019 to 2024. This timeframe allows for the analysis of trends and developments in digital finance adoption and its impacts over a significant duration. The five-year period is sufficient to observe the effects of policy changes, technological advancements, and market dynamics on smallholder farmers. The selected time scope also enables the examination of both short-term and long-term impacts of digital finance initiatives on the target population.

## 03.04: Understanding of the Assignment

The assignment centers on evaluating the current state and impact of Digital Financial Services (DFS) among smallholder farmers in Ethiopia, with a particular focus on Addis Ababa and the surrounding Sheger cities in the Oromia region. Recognizing the critical role smallholder farmers play in Ethiopia's agricultural sector, this study aims to understand how DFS can be leveraged to improve their financial inclusion, productivity, and overall economic well-being. The Ethiopian DFS landscape is evolving, with a growing number of financial institutions and mobile network operators offering DFS products. Mobile money services have seen significant uptake, particularly in urban and peri-urban areas, providing a foundation for further DFS expansion. However, challenges such as limited network coverage in rural areas, low financial literacy, and regulatory hurdles remain. Understanding these practices and challenges is crucial for designing effective interventions that enhance DFS adoption among smallholder farmers. By comprehensively examining these aspects, the assignment aims to provide a detailed understanding of how DFS can be effectively integrated into the financial lives of smallholder farmers in Ethiopia, ultimately contributing to their economic empowerment and agricultural productivity.

### 03.04.01: An overview of the assignment

The scope of work outlined below delineates the key objectives and tasks to be undertaken in conducting a comprehensive study on developing digital financial services for smallholder farmers in Ethiopia. Divided into four distinct areas Value Chain Analysis, Market Trends and User Preferences, Entrepreneurial Opportunities, and Guidelines for Startup

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Empowerment—the scope encompasses a thorough examination of the digital financial services landscape. From mapping the value chain and identifying stakeholders to analyzing market trends and providing actionable recommendations, this scope of work aims to facilitate informed decision-making and empower young entrepreneurs to create innovative solutions tailored to the needs of smallholder farmers.

**a. Value Chain Analysis**

- Map the complete value chain associated with the development and implementation of digital financial services for smallholder farmers.
- Identify key stakeholders and potential entry points for young entrepreneurs in the digital financial services industry.

**b. Market Trends and User Preferences**

- Investigate current market trends in digital financial services, specifically for smallholder farmers.
- Analyze user preferences and their impact on entrepreneurial opportunities in the digital financial services sector.

**c. Entrepreneurial Opportunities**

- Identify specific niches and gaps within the digital financial services sector suitable for start-ups.
- Assess the feasibility and success factors for young entrepreneurs, considering the unique aspects of serving smallholder farmers.

**d. Guidelines for Start-up Empowerment**

- Develop comprehensive guidelines and recommendations tailored for young entrepreneurs aiming to establish start-ups in the digital financial services sector.
- Include insights on funding options, regulatory considerations, and sustainable practices.

## 03.05: Macroeconomic Performances and Agricultural Productivity in Ethiopia

### Macro-economic performances

Improving agricultural productivity in Ethiopia is crucial to alleviate poverty and meet growing food demand amid environmental stress and climate change. Agricultural innovation and access

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to digital agricultural solutions have the potential to boost productivity while reducing negative environmental footprints in agriculture and food system value chains (CCA, 2022).

Ethiopia's real GDP has been growing by an average annual growth rate of 8.9% between 2010/11 and 2020/21 (NBE, 2021). Phenomenal growth (10.1%) recorded average per annum in the 2010/11 – 2014/15 period and decelerated to a yearly average of 7.8% during the 2015/16-to-2020/21-time span. Especially it has been slowing down averaging at 7.1% over the past three years, with a decelerated 6.3% growth in 2020/21. Yet, it is the fourth-largest economy in Sub-Saharan Africa with a GDP at the current market price of USD 107.6 billion in 2019/20 and 111.27 in 2020/21 (NBE, 2021; PDC, 2020). Ethiopia has been among the fastest-growing economies albeit the slowing trend in recent times mainly because of conflicts in the northern and other regions of the country, the COVID-19 pandemic, and policy adjustments that involved fiscal consolidation to stabilize the public debt (NBE, 2021; PDC, 2020). Given the famine and political unrest in various parts of the country, this decline in growth may continue shortly. Yet, the country's 10-year development perspective plan (2020-2030) aspires to attain an average annual GDP growth of 10% (PDC, 2020). As per the plan, there is an aim to uplift the GDP sectorial share of industry from 27.8% in 2020 to 35.9% in 2030 and reduce agriculture's share from 32.8% in 2020 to 22% in 2030.

The GDP per capita income has been growing, attaining USD 1,092 in 2020/21 from USD 815 in 2015/16. The proportion of people living below the poverty line significantly reduced to 19% in 2020 from 29.6% in 2011 (PDC, 2020). As per (NBE, 2021) the service sector took the largest share of GDP in 2020/21 with 39.6% of the total, followed by agriculture (32.5%) and industry (29.3%). The NBE time series data shows that agriculture was the dominant sector with a 51.6 percent share in 2003/04 followed by the service (37%) and industry (10.9%) sectors. Agriculture lost its dominance in 2010/11 as the service sector's contribution to the national GDP climbed to 45.23 percent (while the agricultural sector's share fell to 44.37 percent). The contribution of the industrial sector during these years remained stable as its contribution varied only between 10.1 and 10.9 percent.

During the subsequent years (starting from 2011/12 up to 2020/21) the service sector remained the leading sector followed by the agriculture and industrial sectors. In 2010/11 and onwards showed signs of structural transformation as the contribution of the sectors started to shift. Although agriculture has undoubtedly lost its leading position, the data shows that the direction of the transformation has blurred in recent years as the contribution of the three sectors is showing signs of convergence in the year 2020/21. But clearly, the service sector is leading the pack during the mentioned year. Another dominant fact that one can easily draw from the national GDP data between the years 2010/11 to 2020/21 is the continual growth of the contribution of the industrial sector to the national GDP. This sector's contribution, which used to stand at 10.4 percent in 2010/11 reached 29.3 percent in 2020/21. This is mainly because of the attention the government gave to the structural transformation of the economy.

According to a recent report by the IMF (2020) report the country's macro-economic indicators point to a more mixed picture: public investment was subdued, given government actions to

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control Ethiopia's debt accumulation and to limit budgetary capital outlays in the face of revenue shortfalls; merchandise exports and imports both declined in volume terms; electricity output rose by less than 1 percent; the output of cement products declined by 2.5 percent, although production of iron and steel rose by 11 percent.

### **Agriculture productivity**

Agriculture in Ethiopia is dominated by smallholder farming systems, which together produce more than 90% of agricultural output and cultivate more than 90% of the entire cropland. In recent decades, agricultural production has made some progress; however, it needs further transformation to increase crop production in smallholder farming systems while adapting to and mitigating climate change (Zerssa et al., 2021a). Agriculture is the main pillar of Ethiopia's economy, employing 75% of the labor force, accounting for 40% of GDP, and 80% of the national export value. Approximately 95% of Ethiopian agriculture is rain-fed small-scale farming characterized by low-input, low-output subsistence practices (CCA, 2022).

## **03.06: Digital Financial Services in Ethiopia: Context and Existing Situation**

The effectiveness of DFS for agriculture interventions varies considerably due to differences in context, value chain, geography, and the demographics of target populations. Smallholder families across the world have diverse characteristics and the outcomes that they can derive from DFS will vary considerably (Howard Miller, 2019a). Financial services can enable improved outcomes for the rural poor in several ways, including Increased productivity; Higher incomes and diversified livelihoods; and Higher incomes and diversified livelihoods (Howard Miller, 2019a). Ethiopia is home to 120 million people and is the second most populous nation in Africa. It is also the most populous landlocked country in the world. The population of the country is expected to reach 172 million by 2050 (CCA, 2022). The government plays a central role on a macro scale by formulating enabling strategies, establishing legal and regulatory frameworks, and developing infrastructure. It is anticipated that the government will be actively engaged in executing an inclusive finance strategy, deregulating interest rates, opening up the financial sector, setting up a legal system that upholds contracts and safeguards property and land rights, and ensuring proper legal procedures are followed (Amha, 2011)

Achieving increased economic growth and food security requires successful smallholder farmers and micro, small, and medium-sized (MSME) agribusinesses (IFC, 2022). Smallholder farmers struggle to meet these needs, as banks and other financial institutions have a limited presence in rural communities, and financial products are seldom designed to address the specific characteristics of small farms (IFAD, 2016b). Access to and use of digital services in Ethiopia have increased considerably in the past few years as a result of improvements in telecom and electricity infrastructure. However, access to and use of digital services remain low compared to the rest of the East African region (CCA, 2022).

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According to the Initiative for Smallholder Finance, credit provided by informal and formal financial institutions, including value chain actors, currently meets only an estimated USD 50 billion of the more than USD 200 billion need for smallholder finance in the regions of sub-Saharan Africa, Latin America, and South and Southeast Asia (Melida, 2018). Access to finances is a critical factor for smallholder farmers. Financial support systems in Ethiopia can be separated into informal and formal institutions. Informal financial support institutions are (I) self-support groups for social development (Idhir/Meredaja Mahiber) and (II) traditional voluntary cooperatives (Iqub). Formal institutions are microfinance schemes, state-owned banks, and private commercial banks. There are, however, problems concerning financial and institutional support. The informal financial institutions often lend money at high interest rates, so smallholder farmers face challenges paying back the loan on time. The formal finance providers support commercial farmers but often ignore smallholder farmers (Zerssa et al., 2021a).

Digital literacy in Ethiopia is low. The country ranks 112 out of 138 economies in terms of digital skills of the general population. However, with 69% of the population under the age of 29, there is huge potential to transform digital literacy (CCA, 2022).

### 03.07: Policy and Legal Frameworks

Ethiopia's policy and legal frameworks concerning Digital Financial Services (DFS) are designed to promote financial inclusion, enhance the efficiency of financial transactions, and ensure the stability and security of the financial system. These frameworks are evolving to accommodate the rapid growth of DFS and to address the unique challenges and opportunities they present (Proclamation to Provide for Electronic Transactions, 2020).

The NBE is the primary regulatory authority overseeing the financial sector, including DFS. It sets regulations and guidelines to ensure the safe and sound operation of DFS providers. The NBE has established licensing requirements for mobile money operators and other DFS providers to ensure they meet specific operational, financial, and technological standards (NBE, 2020b).

The following table summarizes macroeconomic policies in Ethiopia with a retrospective view.

Table 1: A summary of Ethiopian policies - a retrospective analysis

| No | Key Indicators | Imperial regime<br>(1930-1974) | Derg regime<br>(1974-1991) | EPRDF-led government<br>(since 1991) |
|----|----------------|--------------------------------|----------------------------|--------------------------------------|
|----|----------------|--------------------------------|----------------------------|--------------------------------------|

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|    |                         |                                                                        |                                                                        |                                                                                                                                           |
|----|-------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | Policy /claim/vision    | Market-oriented economic system                                        | Centralized economic system/ Command economy                           | Market-based                                                                                                                              |
| 2. | Government intervention | Less                                                                   | Strong                                                                 | Less                                                                                                                                      |
| 3. | Private role            | Strong                                                                 | Less                                                                   | Strong                                                                                                                                    |
| 4. | Polices framework       | Import substitution (IS) strategy to shape ID <sup>1</sup>             | State industrialization where continued as a strategy                  | ADLI considers urban development to be a derivative of the rural sector...2002 (Industrial Development Strategy -2012 industrial road map |
| 5. | GDP performance         | The average <i>per capita</i> growth was roughly 1.5 percent.          | per capita, growth being -0.4 percent/Population growth of 2.9 percent |                                                                                                                                           |
| 6. | Exchange rate           | In 1940s-2.48 birr per US dollar and 2.50 birr per US dollar in 1960s. | 2.07 birr per US dollar in 1970s                                       | 5 per US dollar in the 1990s and 12-16 per us dollar between 2000-2010 and 20-50 from 2010 till now                                       |

*The Derg (meaning 'the committee' [of soldiers] in Amharic) came to power after toppling the imperial regime in the 1974 popular revolution*

<sup>2</sup>*As a result many factories were established by private investment of foreign origin. In 1974, the country had 273 establishments, of which 65% were setup with the assistance of foreign investors and 40% were totally owned by foreign nationals.*

<sup>3</sup> *Exchange rate is one of the key barometers of economic performance, indicating output growth, demand conditions, levels and trends in monetary and fiscal policy stance. The legal currency of Ethiopia was issued on 23 July, 1945 by defining the monetary unit as the Ethiopian dollar. The currency Proclamation of 1945, defined the monetary unit of*

1

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Page | 19

*the country as the Ethiopian dollar with a value of 0.355745 g of fine gold. The linkage with fine gold was in accord with the monetary system established by the Bretton Woods Agreement of 1944 and automatically established the exchange rate between the national currency and other currencies with the same arrangement*

Ethiopia's policy and legal frameworks for DFS are progressively adapting to support the growth of digital financial services while safeguarding the interests of consumers and maintaining the integrity of the financial system. These frameworks play a critical role in promoting financial inclusion, enhancing economic efficiency, and ensuring the secure and sustainable development of DFS in the country. National Financial Inclusion Strategy (NFI) (2014-2020) in October 2017 to increase the number of adult transaction accounts from 22 percent in 2014 to 60 percent in 2020. This strategy is intended to build up on the government's 5-year transformation plan of GTP-II. The strategy considered the Ministry of Finance as chairperson, the National Bank of Ethiopia as secretariat, and the remaining Ministry of Agriculture, Ministry of Planning and Development, Policy Research Institute as members (NBE, 2017). The strategy identified that low level of usage of regulated financial services due to mainly lack of awareness, trust and confidence on the financial institutions. The strategy summarized the different challenges of financial inclusions as: (a) underdeveloped financial infrastructure; (b) inadequate supply of a range of suitable financial products, services and access points; (c) inadequate financial consumer protection; and (d) low levels of financial capacity and awareness (NBE, 2017).

Ethiopia issued a new directive, the "Licensing and Authorization of Payment Instrument Issuers Directive," that regulates e-money issuance, allows for non-banks to issue e-money, allows transactions to be performed through mobile phones, and expands the abilities of agents. On May 2021, EthioTelecom launched its mobile-money service, namely, 'telebirr'. Reports suggested that one million subscribers had signed up for the mobile-money service only one week after the launch, and the National Bank of Ethiopia estimates roughly 3 million subscribers (as of June, 2021).

## 03.08: Limitations

This study on digital financial services (DFS) among smallholder farmers is subject to certain limitations, which are important to acknowledge:

### Preliminary Review Based on Available Documents and Resources:

- ✓ The evaluation of DFS methods presented in this report is preliminary and primarily based on the review of existing documents and resources.
- ✓ This reliance on secondary data means that the analysis may not capture the most current and nuanced practices and developments in the field of DFS.
- ✓ The absence of extensive primary data collection at this stage limits the depth of insights into the practical and on-ground realities faced by smallholder farmers.

### Geographical and Temporal Scope Limitations:

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- ✓ The assessment is geographically focused on Addis Ababa and the surrounding Sheger cities, which may not represent the diverse experiences and practices of DFS across different regions of Ethiopia.
- ✓ Variations in DFS practices due to regional, seasonal, and economic factors might not be fully captured, potentially leading to an incomplete understanding of the broader context.

#### **Potential Data Gaps:**

- ✓ The study might encounter data gaps due to the limited availability of comprehensive and up-to-date information on DFS practices among smallholder farmers.
- ✓ Some critical aspects of DFS usage and its impact on smallholder farming may not be thoroughly explored due to these gaps.

By recognizing these limitations, the study aims to provide a foundation for further, more detailed research and analysis that addresses these gaps and offers a comprehensive understanding of the role and impact of DFS among smallholder farmers in Ethiopia.

## **04: Review of Literature**

The review of the literature provides a comprehensive overview of the existing research on digital financial services (DFS) and their impact on financial inclusion, particularly in rural and agricultural contexts. It examines key theories and empirical studies that explore the role of DFS in enhancing access to financial products, improving market efficiencies, and supporting smallholder farmers.

This section focused on the various factors influencing DFS adoption, such as mobile phone ownership, digital literacy, and infrastructure challenges. It also explores the potential benefits of DFS, including increased savings, access to credit, and risk management through insurance services. Additionally, the literature review identifies gaps in current research, particularly regarding the specific challenges faced by smallholder farmers in accessing and using DFS, laying the groundwork for the study's research objectives and methodology.

### **04.01: Context and Theoretical Underpinnings in Digital Financial Services**

Smallholder farmers have limited access to financial services, which constrains their ability to manage risks, invest and expand production, and improve their livelihoods and well-being. Digital financial services (DFS) and digital platforms have the potential to offer both women and men farmers increased access to financial services and products by overcoming geographic and physical barriers and high transaction costs, as well as by increasing transparency and trust in financial systems (Melida, 2018). Aggregated estimates put the demand for smallholder farmer (SHF) financing for approximately 270 million SHF in Latin America, Sub-Saharan Africa, and South and Southeast Asia (IFC, 2022). A growing number of payments, savings, credit, and insurance products can be delivered digitally to address the financial needs of smallholder

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households. Smallholders can especially benefit from mobile phone platforms, which offer immediate, safe access to government subsidies, cash transfers, and remittances (IFAD, 2016b).

Digital financial services (DFS) have emerged as a potential response to financial exclusion by easing access to credit, savings, payment mechanisms, remittances, and insurance. These innovative platforms can help overcome barriers related to geographic and physical barriers and high transaction costs, as well as increase transparency and trust in financial systems (Melida, 2018). Farmers, especially smallholder farmers operating on a plot size of one hectare (Ha) or less, and agribusinesses face chronic challenges of a limited supply of financial services including savings, credit, and insurance as well as agricultural information and other related support services. The agriculture sector is, however, a significant and in many cases untapped market for financial service providers (IFC, 2022). There is compelling evidence from Kenya indicating that mobile money has had a beneficial effect on the lives of rural individuals with limited resources. Research suggests that M-PESA, for instance, has notably boosted per capita incomes and helped elevate approximately two percent of Kenyan households above the poverty line (Howard Miller, 2019a).

**Box 1:** Digital Financial Products and Services. The following are the principal digital financial offerings

**Credit scoring:** new and alternative credit scoring mechanisms (beyond credit bureaus) that allow farmers to develop credit profiles, including data from mobile prepaid sources such as airtime transactions, psychometric testing, and payment/e-commerce data (East Africa had the greatest prevalence of these products).

**Loan disbursement and collection:** including digital channels that can deliver instant credit, and loan repayments that reduce time and transaction costs.

**Savings:** this includes non-bank financial institutions offering interest-bearing savings accounts with mobile wallets, as well as conventional banks extending their reach to rural and other areas.

**Insurance:** including mobile money service providers partnering with insurance companies to offer a range of products, as agricultural insurance lags behind other types of insurance (life was 51% of offerings, health 22%, and agriculture only 7% in the 150+ cases reviewed).

**Payments:** including mobile money, cash transfers, bill payments, and card-based products. Digital payments for agricultural products have led to around 40 million adults in developing economies opening an account.

**Market pricing:** including information on agricultural market prices provided digitally, based on geographic information.

Source: (CCA, 2022; Howard Miller, 2019a; IFAD, 2016b; IFC, 2022; Melida, 2018; Zerssa et al., 2021a)

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The development of Digital Financial Services (DFS) for Smallholder Farmers (SHF) is grounded in several theoretical perspectives that explain the relationship between technology, financial inclusion, and rural development as elaborated beneath:

### **1. Financial Inclusion Theory**

Financial inclusion theory refers to the concept of providing individuals and communities with access to affordable and appropriate financial products and services, such as savings, credit, insurance, and payment services. The goal of financial inclusion is to promote economic development, reduce poverty, and empower individuals to manage their finances effectively (Ozili, 2020). Financial inclusion theory emphasizes the importance of providing access to financial services to underserved populations. By integrating SHFs into the formal financial system through DFS, they gain access to savings, credit, insurance, and payment services, which can help stabilize and improve their economic activities.

### **2. Diffusion of Innovations Theory**

Everett Rogers' Diffusion of Innovations Theory explains how, why, and at what rate new ideas and technology spread. In the context of DFS, this theory helps understand how digital financial solutions can be adopted by SHFs, considering factors like relative advantage, compatibility, complexity, trialability, and observability (Sahin, 2006). This theory is especially relevant in DFS adoption in developing economies like Ethiopia, where financial inclusion efforts aim to transition underserved populations from cash-based economies to digital platforms.

The Diffusion of Innovations theory offers valuable insights into the adoption of Digital Financial Services in Ethiopia. While DFS has the potential to revolutionize financial inclusion and economic empowerment, its success depends on understanding the social, cultural, and infrastructural context in which it operates. Considering this theory principles, policymakers and DFS providers can craft more effective strategies to accelerate the adoption of these services, particularly among smallholder farmers and rural populations, ensuring that the benefits of digital finance are realized across the country.

### **3. Technology Acceptance Model (TAM)**

The TAM posits that perceived usefulness and perceived ease of use are critical factors in determining the acceptance of technology. This model is useful for designing DFS solutions that SHFs are likely to adopt, ensuring that these services are seen as valuable and easy to use (Lule et al., 2012). The Technology Acceptance Model (TAM) provides a valuable lens through which to understand the factors influencing the adoption of Digital Financial Services (DFS) in Ethiopia. By focusing on perceived usefulness and perceived ease of use, DFS providers and policymakers can develop targeted strategies to enhance the adoption of these services. Addressing challenges such as digital literacy, trust, and infrastructure will be key to unlocking the potential of DFS for advancing financial inclusion, especially among smallholder farmers and rural populations.

### **4. Institutional Theory**

Institutional theory examines how institutional environments influence the behavior of organizations and individuals (North, 1990). This perspective is relevant for understanding how

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regulatory frameworks, cultural norms, and existing financial infrastructures impact the adoption and implementation of DFS for SHFs. In the context of DFS, Institutional Theory provides insights into the role of various institutional forces (e.g., governments, financial regulators, cultural norms) in either facilitating or hindering the development and diffusion of these services, particularly in developing countries like Ethiopia. The theory underscores the importance of regulatory frameworks, market structures, cultural acceptance, and institutional legitimacy in shaping how DFS is perceived and used by individuals and organizations.

Institutions are shaped by formal rules, regulations, and policies, which in turn influence the behavior of actors within the system. In the context of DFS, regulatory frameworks are crucial in determining the growth and adoption of digital financial platforms. In many developing countries, the regulatory environment governing DFS can either act as an enabler or a barrier. For instance, in Ethiopia, the National Bank of Ethiopia (NBE) plays a critical role in setting rules for mobile banking, mobile money, and other DFS platforms. Regulations on issues such as licensing, transaction limits, and know-your-customer requirements directly affect how easily financial institutions and mobile network operators can provide DFS services (NBE, 2017, 2020a, 2020b). Legal provisions regarding consumer protection, data privacy, and cybersecurity are crucial for building trust in DFS platforms. Without strong regulatory oversight, users may be hesitant to adopt DFS due to concerns over fraud or misuse of personal data.

#### **Theoretical Debate to be considered are:**

The debate around DFS for SHFs encompasses several key areas:

#### **1. Access vs. Usage**

While increasing access to financial services through DFS is important, there is debate about the actual usage and impact of these services on SHFs. Ensuring that SHFs not only have access but also actively use these services in ways that improve their livelihoods is crucial.

#### **2. Technology Adoption Challenges**

Challenges such as digital literacy, trust in digital platforms, and infrastructure limitations (e.g., poor internet connectivity) are significant barriers. There is debate on the best approaches to overcome these challenges and ensure that DFS solutions are effectively adopted by SHFs.

#### **3. Sustainability and Scalability**

There is a discussion on how to make DFS solutions sustainable and scalable. This includes considerations of business models, partnerships, and the role of government and international organizations in supporting the scale-up of DFS.

#### **4. Impact on Traditional Financial Systems**

The introduction of DFS has implications for traditional financial institutions and systems. There is debate on how these institutions can adapt to the digital transformation and what role they should play in the evolving financial landscape.

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## 04.02: Conceptualizing Digital Financial Services (DFS) for Smallholder Farmers (SHFs)

The broad range of financial services accessed and delivered through digital channels, including payments, credit, savings, remittances, and insurance are known as digital financial services. The Digital Financial Services (DFS) concept includes mobile financial services. Hence, digital finance can be defined as financial services delivered over digital infrastructure including mobile and internet low use of cash, and traditional bank branches. Using this particular mode of transaction entails less use of cash and the utility of traditional bank branches (Begum, 2018). Digital Financial Services (DFS) for smallholder farmers refers to the use of digital technologies and platforms to provide financial services tailored to the needs and constraints of small-scale agricultural producers. These services aim to improve financial inclusion, facilitate access to credit, savings, insurance, payments, and other financial products, and enhance the overall efficiency and resilience of agricultural value chains. The concept encompasses various elements that are crucial for effectively serving the financial needs of SHFs. Although not exclusive, the following key aspects manifest the DFS for SHFs.

- **Access to financial services:** DFS for SHFs focuses on expanding access to formal financial services for individuals and households engaged in small-scale farming activities. This includes access to savings accounts, credit facilities, insurance products, and payment mechanisms.
- **Mobile and digital technologies:** the use of mobile phones, internet connectivity, and digital platforms forms the backbone of DFS for SHFs. Mobile money services, mobile banking applications, and other digital channels enable SHFs to conduct financial transactions conveniently and securely, even in remote or underserved areas.
- **Agri-focused financial products:** DFS tailored for SHFs often include specialized financial products designed to meet the unique needs of agricultural producers. This may include crop insurance, weather-indexed insurance, agricultural input loans, equipment leasing, and other services that address the specific risks and challenges faced by farmers.
- **Financial literacy and education:** effective DFS initiatives for SHFs incorporate financial literacy programs and educational initiatives to enhance farmers' understanding of financial concepts, digital tools, and best practices for managing their finances. This empowers SHFs to make informed decisions and maximize the benefits of available financial services.
- **Integration with agricultural value chains:** DFS solutions are integrated into agricultural value chains to streamline financial transactions and facilitate market linkages for SHFs. This integration may involve partnerships with agricultural input suppliers, buyers, cooperatives, and other stakeholders to provide seamless access to financial services throughout the production and marketing process.
- **Risk management solutions:** DFS for SHFs often include risk management solutions such as crop insurance, savings accounts for emergencies, and access to credit during

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periods of income volatility. These tools help SHFs mitigate risks associated with weather fluctuations, market volatility, and other uncertainties inherent in agricultural production.

- **Data analytics and insights:** digital platforms and data analytics play a crucial role in DFS for SHFs by providing insights into farmers' financial behaviors, preferences, and needs. By leveraging data-driven approaches, financial service providers can tailor their offerings more effectively and design targeted interventions to support SHFs' financial resilience and growth.

Overall, DFS for SHFs represents an innovative approach to addressing the financial inclusion gap both in rural and urban areas and empowering small-scale farmers to improve their livelihoods, increase productivity, and build resilience in the face of economic and environmental challenges.

## 04.03: A Conceptual Framework for the Assignment

The agricultural sector in Ethiopia, dominated by smallholder farmers, plays a pivotal role in the country's economy. However, access to financial services remains limited among these farmers, hindering their productivity and growth potential (Amha, 2011; CCA, 2022; IFAD, 2016b). This conceptual framework outlines a study aimed at exploring business opportunities for developing digital financial services tailored to the needs of smallholder farmers in Ethiopia.

Anchored on discussions made on the introduction, objectives, and scope of the assignment, the consulting firm primarily commences with developing a conceptual framework illustrated beneath which expounds the likely correlation among different elements of examining digital financial services for smallholder farmers in Ethiopia. This conceptual framework provides a roadmap for conducting a comprehensive study on business opportunities in developing digital financial services for smallholder farmers in Ethiopia. By addressing the financial needs and constraints of smallholder farmers through innovative digital solutions, this study aims to enhance financial inclusion, improve agricultural productivity, and contribute to sustainable economic development in Ethiopia.

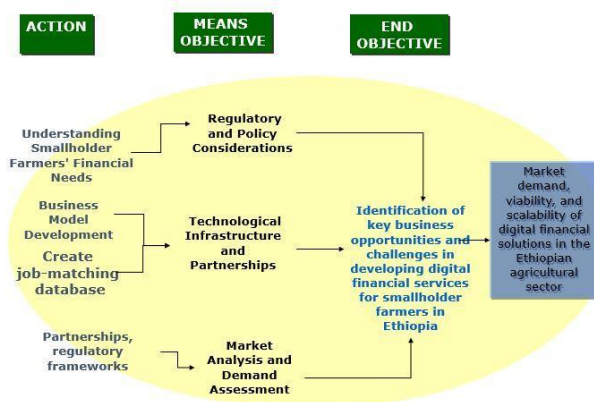


Figure 1: A conceptual framework for the assignment

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## Box 2: Conceptual Framework Components

**Understanding Smallholder Farmers' Financial Needs:** Conducting interviews, and focus group discussions to understand the financial behaviours, challenges, and aspirations of smallholder farmers. Hence, analyzing existing financial inclusion initiatives, formal and informal financial services utilized by smallholder farmers, and their effectiveness.

**Business Model Development:** Exploring various business models for delivering digital financial services to smallholder farmers, such as mobile banking, digital payments, and credit scoring, insurance, and savings products. In addition, assessing the feasibility, scalability, and sustainability of different business models in the Ethiopian context.

**Market Analysis and Demand Assessment:** Analysing the market dynamics, size, growth potential, and competitive landscape of digital financial services for smallholder farmers in Ethiopia. Besides, assessing the demand for specific financial products and services, it includes payment solutions, credit facilities, insurance coverage, and savings options.

**Regulatory and Policy Considerations:** Reviewing existing regulations, policies, and legal frameworks governing digital financial services and agriculture in Ethiopia. Hence, identifying regulatory barriers, licensing requirements, and compliance issues that may affect the deployment of digital financial solutions for smallholder farmers. Moreover, engaging with regulatory authorities, policymakers, and stakeholders to advocate for an enabling environment conducive to innovation and investment in digital finance.

**Technological Infrastructure and Partnerships:** Assessing the technological infrastructure, connectivity, and digital literacy levels among smallholder farmers in Ethiopia. In addition, exploring partnerships with telecom operators, financial institutions, agribusinesses, fintech start-ups, and development organizations to leverage existing networks and expertise.

Source: (CCA, 2022; Digital, n.d.; Howard Miller, 2019a; IFAD, 2016b; Melida, 2018)

## 04.04: Opportunities and Challenges of DFS

Digitization of financial transactions extends the traditional mobility benefits to finance, facilitating anywhere, anytime transactions, and flexibility in sending and receiving payments (Begum, 2018). DFS offers many opportunities to expand financial inclusion and benefit smallholder farmers. However, there are some changes as well:

### Box 3: Opportunities and challenges of DFS based on (IFAD, 2016b)

#### Opportunities:

- **Rural reach.** Digital technologies, especially via mobile phones, can reach agricultural communities where traditional FSPs have no presence.

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- **Resilience and consumption smoothing.** Smallholder farmers can safely save small amounts of money at any time, either in their mobile money accounts or in dedicated savings accounts that are accessible via a mobile phone.
- **Advance planning.** With easier access to savings, either accumulated in a mobile money account or linked to a savings account, smallholder farmers can prepare for annual agricultural expenses, such as quality fertilizer and seed, and household expenses, such as school fees. Goal-based
- **More expedient access to safety nets.** Digital platforms open doors to improved targeting and more expedient delivery of government support programs (such as agricultural subsidies and social cash transfers).
- **Improved farming.** Agricultural insurance is one of the most notable services arising from the new technology platforms. One example is weather index insurance, which pays farmers automatically into a mobile money account.
- **Better access to value chains.** For smallholder farmers with surplus crops but limited access to markets, greater access to financing (based on digitally-based credit scoring mechanisms) could help them invest in developing the product quality and quantity desired by buyers.

#### Challenges:

- **Limited financial product choices for smallholder farmers.** The majority of digital financial products, such as mobile credit and savings, offer terms that are not suitable to agricultural incomes. Internet connectivity is a critical component of digital transformation and has the potential to drive socioeconomic development. Citizens and businesses can participate in the digital economy when they have access to affordable and high-quality internet, which allows them to share information and conduct online transactions
- **Low quantity and quality of agent networks.** Smallholder access to both mobile and non-mobile financial services depends largely on agent networks in rural areas. Even though establishing agents is less onerous than opening a bank branch, rural areas often do not have enough agent coverage.
- **Inadequate infrastructure.** The availability and reliability of DFSs depend on the robustness of the data networks in place in rural areas. Mobile connectivity is greatly expanding, even in remote areas, but there are still many countries and rural areas with limited or no connectivity. Digital connectivity is a critical component of any successful implementation of DFS in agriculture. Financially excluded farmers tend to

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live in rural areas where mobile network and data connectivity tend to be unreliable or non-existent.

- **Insufficient consumer protection measures.** Smallholder farmers have few available recourse mechanisms for reporting transaction problems or fraud

Source:(Amha, 2011; CCA, 2022; Howard Miller, 2019a; IFAD, 2016b; IFC, 2022; Melida, 2018; Zerssa et al., 2021a)

Adopting digitization in financial services and including most of the population in the net of banking will help in the growth and development of the country. With several digital financial instruments in the market, the consumer now has more choice than ever (Begum, 2018). The effort to expand outreach and efficiency in delivering financial services to smallholder farmers in Ethiopia should address the following issues:

#### **Box 4:** Prerequisites for efficient delivery of DFS

- Like many African countries, smallholder farmers in Ethiopia are located in dispersed areas due to low population densities as well as a difficult terrain, which increases transaction costs of finance providers
- Smallholder farmers often demand relatively small loans and savings accounts, which again increase the per-unit transaction costs of financial providers.
- Smallholder farmers are heterogeneous, with varying skill and cultural backgrounds.
- Getting information to make an accurate assessment of the willingness and capacity of smallholder farmers to repay loans often takes time and money.
- The weak institutional capacity of finance providers affects their outreach, efficiency, and sustainability.
- Providing financial services to smallholder farmers is perceived as being less sound or risky because of the covariate risks tied with agricultural production and marketing risks, seasonality, and the absence of formal insurance mechanisms to mitigate risks.
- Smallholder farmers have little acceptable collateral, due to either a lack of assets or unclear property rights or a proper registry system for movable assets they possess.
- Poor communication systems and physical infrastructure increase transaction costs.

Source: (Amha, 2011)

## **04.05: Countries Experiences at a Glance**

### **Kenya**

The Kenyan agricultural sector is its economic cornerstone. Agriculture employs more than 40% of the total population and contributes 30% to the Gross Domestic Product (GDP) (FAO, 2021). A significant proportion of farmers in Kenya have adopted mobile money services, indicating a

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high level of acceptance and integration of MFS in their daily financial transactions. M-Pesa, launched by Safaricom, is a mobile money transfer service that has revolutionized financial inclusion in Kenya. Building on its success, M-Shwari, a savings and loan service, was introduced to offer financial services to unbanked populations, including smallholder farmers. (Parlasca et al., 2022). The private sector plays a key role in leading digital innovation and profitable digital solutions in Kenya. Safaricom, which now holds 63% of all mobile subscriptions, is the implementer of the acclaimed M-Pesa service (FAO, 2021). In Kenya to analyze the use of digital services, such as credit and savings, among farmers found that about 80% of farmers used mobile money, but only 15% used mobile services for agriculture-related payments, and less than 1% of the farmers used mobile phones to access digital loans (Mapanje et al., 2023).

DFS in Kenya for smallholder farmers can receive payments for their produce, save money, and access micro-loans. This has improved their financial stability and ability to invest in agricultural inputs (Parlasca et al., 2022). Despite high adoption rates, issues such as digital literacy and access to mobile phones and networks in remote areas remain challenges.

The financial technologies being accessed by smallholder farmers help in addressing one or more of the SDGs. Some of these include SDG 1, SDG2, SDG 8, and SDG 13. In addition, the review has shown that with FinTech, some countries in SSA (e.g., Kenya) are global leaders in mobile money services, offering a wide range of financial services and products to smallholder farmers. Other African countries can learn from the Kenyan experiences and scale up/replicate the FinTech model successfully financed smallholder agriculture in Kenya (Mapanje et al., 2023). Mobile financial services have substantially increased financial inclusion among smallholder farmers, providing them with access to financial services that were previously unavailable (Parlasca et al., 2022). The insights from the use of mobile financial services among farmers in Kenya provide valuable lessons for enhancing DFS in Ethiopia. By promoting widespread adoption, enhancing financial inclusion, improving infrastructure, building financial literacy, and fostering a supportive regulatory environment, Ethiopia can leverage DFS to transform its agricultural sector, increase productivity, and improve the livelihoods of smallholder farmers.

## India

Digital financial services in India have seen significant growth in recent years, especially with the rise of digital payment platforms such as Paytm, Google Pay, PhonePe, etc. These services have made it easier for people to transfer money, pay bills, make purchases online, and even invest in mutual funds or stocks (Begum, 2018).

### Impact of Digital Financial Services in India

- ✓ **Financial Inclusion:** DFS has significantly increased financial inclusion, bringing millions of unbanked individuals into the formal financial system. PMJDY accounts linked to digital payment systems have facilitated this inclusion.
- ✓ **Economic Empowerment:** By providing easy access to credit, savings, and insurance, DFS has empowered individuals and small businesses, driving economic growth and poverty reduction.

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- ✓ **Government Benefits and Subsidies:** The direct benefit transfer system, enabled by Aadhaar and linked to digital payment platforms, has ensured efficient and transparent delivery of government benefits and subsidies.
- ✓ **Cashless Economy:** The demonetization initiative in 2016 provided a significant push towards a cashless economy, with a substantial increase in digital transactions.

Aadhaar-enabled payment System (AEPS) linked with the unique Aadhaar identity number, facilitates banking transactions at micro-ATMs through biometric authentication and Kisan Credit Card (KCC) scheme provides timely credit to farmers for their agricultural needs. Smallholder farmers benefit from easier access to subsidies, loans, and direct benefit transfers. AEPS has enabled secure and straightforward transactions without needing traditional bank infrastructure (Begum, 2018).

India's experience with digital financial services provides valuable lessons for Ethiopia and other developing countries aiming to enhance financial inclusion and economic empowerment through digital means. By focusing on infrastructure development, regulatory support, financial literacy, and fostering innovation, Ethiopia can create a robust DFS ecosystem that supports its smallholder farmers and the broader population.

## **Bangladesh**

Bangladesh has been a global leader in introducing and expanding the services of nontraditional financial service providers. Microfinance institutions (MFIs)-including ASA, the largest in the world, BRAC, Buro, and Grameen Bank-and mobile money have driven advances in financial services for rural, impoverished populations (Jamie Anderson, 2016)

In Bangladesh, bKash is a mobile financial service provider that offers a range of financial services, including money transfer, savings, and payments, to underserved populations in Bangladesh.

Smallholder farmers use bKash to receive payments, save money securely, and make transactions without traveling to distant banks. This has increased their financial inclusion and economic resilience. Yet, regulatory hurdles, interoperability issues, and network connectivity in rural areas are ongoing challenges.

## **Ghana**

Tigo Cash is a mobile money service, while e-Zwich is a biometric smart card-based payment system. Both services aim to enhance financial inclusion for the unbanked, including smallholder farmers. Farmers can receive payments for crops, pay for agricultural inputs, and save money securely. These services reduce the need for cash transactions and improve financial management.

Digital financial services have been gaining traction among smallholder farmers in Ghana, allowing them to access financial services such as savings, loans, and insurance through their mobile phones. These services help farmers manage their finances more efficiently, access credit to invest in their farms and mitigate risks associated with agricultural production (Atta-Ankomah et al., 2024). Some of the key benefits of digital financial services for smallholder

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farmers in Ghana include improved financial inclusion, increased access to formal financial services, reduced transaction costs, and enhanced efficiency in financial transactions (Peprah et al., 2020). Yet, challenges such as digital literacy, rural network infrastructure, and trust in digital services need to be addressed to enhance adoption.

**Lesson learned**

**Digital Literacy:** Across all these countries, digital literacy remains a significant barrier. Ensuring that smallholder farmers understand and can effectively use DFS is critical for success.

**Network Infrastructure:** Poor network coverage in rural areas limits the reach of DFS. Investments in infrastructure are needed to improve accessibility.

**Trust and Security:** Building trust in digital systems and ensuring the security of transactions is essential to encourage adoption among smallholder farmers.

**Regulatory Environment:** Supportive regulatory frameworks are necessary to foster the growth and sustainability of DFS. This includes ensuring consumer protection and enabling interoperability among different service providers.

**02.6: Empirical Key Findings**

The following studies underscore the importance of addressing systemic barriers to improve agricultural productivity and resilience among smallholder farmers in Ethiopia. The institutional design of lending organizations and the adoption of DFS are critical components in enhancing access to finance, technology adoption, and sustainable farming practices. Coordinated efforts from the government, financial institutions, technology providers, and the farming communities are essential to realize these opportunities and overcome the challenges faced by smallholder farmers.

In simple terms, Ethiopia's efforts to improve digital financial services (DFS) can learn useful lessons from studies on how rural communities' access financial services and adopt agricultural technology, as well as the benefits of DFS. By offering financial products that are inclusive and adaptable, removing barriers to accessing funds, and providing a range of support services, DFS can greatly boost the financial inclusion and productivity of small-scale farmers. Furthermore, promoting the use of DFS Agriculture practices through specific financial products and incentives can help make Ethiopia's agricultural sector more resilient and sustainable. With the right policies, cooperation, and creative strategies, DFS can play a crucial role in improving smallholder farming practices in Ethiopia.

**Table 1: Selected article's key findings**

| Author/s<br>year | and Focus           | Methods employed                            | Key findings                                                    |
|------------------|---------------------|---------------------------------------------|-----------------------------------------------------------------|
|                  | This study explores | - The study employed a multi-stage sampling | - Despite numerous digital opportunities, farmers primarily use |

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| Author/s and year         | Focus                                                                                                                                                              | Methods employed                                                                                                       | Key findings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (Abdulai et al., 2023)    | extent to which agricultural digitization is a reality for smallholder farmers in rural Northern Ghana                                                             | technique to survey 1,565 farmers in Northern Ghana                                                                    | <p>basic devices like mobile phones, radios, and TVs due to limited internet access and digital literacy</p> <ul style="list-style-type: none"> <li>- The main sources of digital services are subsidized NGOs and private projects utilizing SMS, IVR, radio, and field agents</li> <li>- Participation in digital services is minimal, hindered by low literacy, lack of digital skills, and restricted access to digital resources</li> <li>- Full-scale digitalization remains a distant goal, but there are opportunities to develop digital solutions tailored to smallholder farmers' realities</li> <li>- The study emphasizes the need for policies and interventions that consider the structural limitations of smallholder agriculture to enhance digitalization efforts in Africa</li> </ul> |
| (Deresse & Zerihun, 2018) | -This study examines the financing challenges faced by smallholder farmers who are members of agricultural cooperatives in the Southwest Oromia Region of Ethiopia | The study utilizes a mixed-method approach, incorporating both qualitative and quantitative data collection techniques | <ul style="list-style-type: none"> <li>- Smallholder farmers in the Southwest Oromia region face significant challenges in accessing finance</li> <li>- Agricultural cooperatives play a crucial role in facilitating access to finance for smallholder farmers.</li> <li>-The financial constraints faced by smallholder farmers adversely affect their ability to invest in essential agricultural inputs such as seeds</li> </ul>                                                                                                                                                                                                                                                                                                                                                                      |

| Author/s and year                    | Focus                                                                                                                                                                                                           | Methods employed                                                                                                                                       | Key findings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (Zerssa et al., 2021b)               | -This study explores the challenges faced by smallholder farmers in Ethiopia and the potential opportunities presented by adopting Climate-Smart Agriculture (CSA) practices.                                   | -Key Informant Interviews (KII)<br>- Focus Group Discussions (FGD)<br>- Surveys                                                                        | - Insecure land tenure and insufficient policy support hinder sustainable land management<br>- These findings underscore the need for a multi-faceted approach involving improved knowledge transfer, economic support, and policy reforms to promote the adoption of CSA practices among smallholder farmers in Ethiopia                                                                                                                                                                                                                                                           |
| (Gashaw Abate & Getnet Kindie, 2016) | -This study investigates the relationship between rural finance and agricultural technology adoption in Ethiopia, focusing on whether the institutional design of lending organizations influences this dynamic | -The study employs a mixed-method approach, integrating both qualitative and quantitative data collection techniques to provide comprehensive insights | -MFIs often employ group lending models and provide smaller loans with relatively flexible terms<br>-Commercial banks typically offer larger loans with stricter collateral requirements and higher interest rates<br>-Cooperatives provide a community-based approach to lending, often offering more favorable terms and support services<br>-The availability and accessibility of financial services are critical determinants of technology adoption among smallholder farmers. Institutions with more inclusive lending practices tend to facilitate higher rates of adoption |

| Author/s and year      | Focus                                                                                                                                  | Methods employed                                                                                                                       | Key findings                                                                                                                                                                                                                                                                                                                    |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (Mapanje et al., 2023) | - This study aims to elucidate the crucial role that FinTech can play in financing sustainable agriculture in sub-Saharan Africa (SSA) | - The study shortlisted 17 SSA countries. The literature on FinTech-enhanced agricultural initiatives in these countries were reviewed | - The integration of FinTech into the agricultural sector in SSA has significant potential to promote sustainable practices and enhance financial inclusion.<br><br>-By leveraging digital technologies, smallholder farmers can overcome production and marketing challenges, leading to increased productivity and resilience |

## 05: Technical Approach and Methodology

The technical approach and methodology were designed to ensure a thorough, efficient, and impactful execution of the project, leveraging our team's expertise and aligning with global best practices. This approach enabled us to deliver high-quality results that meet the client's objectives and contribute to sustainable development. The methodology is structured to facilitate a detailed and thorough execution of the project, from initial assessments to the final delivery of results.

### 05.01: Approaches followed

The Terms of Reference (ToR) formulated for the study clearly illustrate the requirements in terms of overall objectives and specific objectives. To address and incorporate the requirements of the study, we have accordingly designed a three-way approach:

- ✓ First, a general appreciation of the specific objectives with comprehensive action to tackle the TOR requirement;
- ✓ Second, a detailed approach stipulating the activities that were undertaken; and

During the inception phase, we identified data requirements and reviewed previous studies and reports relevant to the Study. This process helped pinpoint data gaps about the scope of services of the study, enabling us to design and organize primary surveys and field investigations appropriately. These primary surveys and field visits were planned to address the data gaps and obtain necessary spatial dimensions, aligned with the intended scope and coverage of the study. The effort to identify data requirements encompasses all study activities, ensuring that all project components are thoroughly addressed.

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**Focus on Strategic Issues:** emphasis was placed on addressing strategic issues outlined in the TOR, with a dedicated focus on data collection and analysis about these areas. The study primarily involves reviewing existing theoretical and empirical literature on DFS, alongside conducting empirical research to assess DFS's impact on smallholder farmers in Ethiopia.

**Participation:** Relevant bodies were to participate in providing information including ACCSSA members, business associations, institutions, and stakeholders, and undertake quantitative and qualitative data analysis techniques. Various discussions were conducted during data collection with these identified stakeholders.

**Pilot-testing:** After a series of discussions on how to conduct the study, the methodologies to be followed were pre-tested on selected institutions for:-

- ✓ Creating common understanding among experts of the various teams; and
- ✓ Identifying problems on methodologies and approaches, if they may arise, at an earlier stage so as to make timely corrections.

It is believed that the pilot testing ensured the quality of the output of the study.

The methodology section outlines the systematic approach adopted to conduct a comprehensive study on the development of digital financial services for smallholder farmers in Ethiopia. This section elucidates the types, sources, and methods of data collection employed to gather relevant information, as well as the qualitative and quantitative data analysis techniques utilized to derive meaningful insights. Additionally, it delineates the measures undertaken to ensure data quality assurance throughout the research process. By adhering to rigorous research methodologies, this study aims to generate robust findings that inform decision-making and contribute to the advancement of digital financial inclusion for smallholder farmers in Ethiopia.

#### **Box 5:** Approaches employed for the study

- **Literature review:** reviewed the available literature related to digital financial services. It includes government policy and strategies, researchers, legal frameworks, existing studies, macroeconomic performances, initiatives taken for digital financial sectors, and international experience in digital financial services from both developed and developing countries.
- **Key Informant Interviews (KIIs):** conducted some Key Informant Interviews with related government officials and collected their views on DFS, their ongoing policies and practices, their future planning for the management of DFS, etc.
- **Survey:** conducted a comprehensive survey as a critical component of the study. This survey was meticulously designed to collect primary data, filling the identified gaps and providing robust insights into the strategic issues outlined in the TOR.

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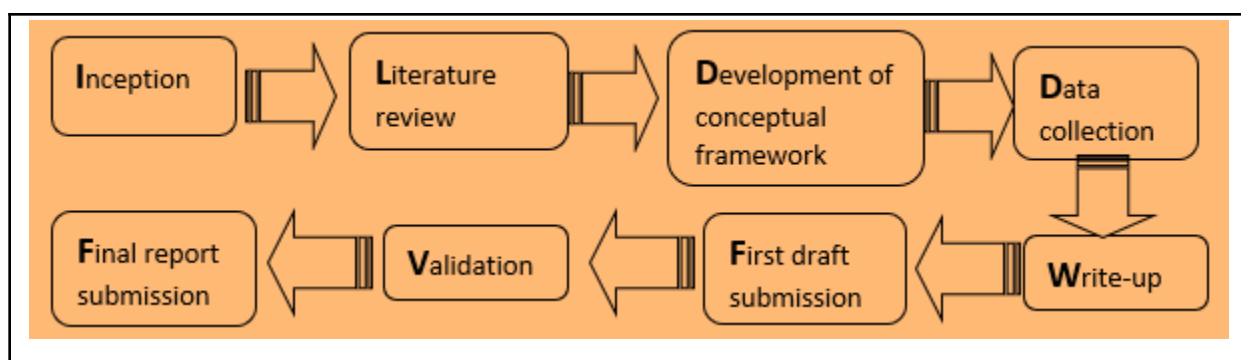
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Through this detailed survey approach, the we aim to generate valuable primary data that enhances the overall understanding of DFS impacts and informs the development of tailored interventions for smallholder farmers in Ethiopia.

- **In-house consultation:** while conducting the research, we accessed relevant stakeholders on various aspects, i.e. selecting the relevant institutions, designing the questionnaires for KIs, analysing the collected data and preparing the report.
- **Developing interview protocol:** while preparing the questionnaires for research, we developed an interview protocol. It was not only contain the questionnaire but also a procedural guide to direct the interview process. A script was developed for the researcher which used before the interview and at the conclusion of the interview or discussion. Interview protocol prompts the interviewer to collect informed consent and prompts to remind the interviewer of the information that she/he is interested in collecting.

The ensuing chart recapitulates the methodological path pursued from start to end.



**Figure 2:** Methodological roadmap of the study

## 05.02: Materials and methods

By employing these materials and methods, the study aims to generate robust, reliable, and actionable insights into the impact of DFS on smallholder farmers in Ethiopia. In the subsequent, elaborate details on methods and type of data collection, and the potential stakeholders/actors (source of data) aligned with the four key objectives /scopes of the DFS for SHFs.

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## 05.02.01: Key Informant Interview

Key informant interviews (KIIs) are an essential qualitative research method used to gather in-depth insights from individuals who have specialized knowledge or expertise related to the study. In the context of this assignment, KIIs were provided valuable information on the impact of Digital Financial Services (DFS) on smallholder farmers (SHF) in Ethiopia. These interviews helped to understand the broader context, identify challenges and opportunities, and validate findings from other data sources. Key informants were selected based on their relevance to the study and their expertise in areas such as digital finance, agricultural practices, and rural development. This method has been selected to address DFS from the supply-side perspective.

### Box 7: Key Informant

**Government Officials:** Representatives from the Ministry of Finance, Ministry of Agriculture, and other relevant agencies who can provide policy perspectives and insights into government initiatives related to DFS and agriculture.

**Financial Institutions:** Executives and managers from national banks, microfinance institutions, and mobile money providers who can discuss the implementation and impact of DFS on smallholder farmers.

**Agricultural Experts:** Agronomists, researchers, and extension officers with first-hand knowledge of smallholder farming practices and challenges.

**NGOs and Development Organizations:** Representatives from organizations involved in promoting DFS and supporting smallholder farmers.

**Community Leaders and Farmer Representatives:** Influential local figures and farmers who can provide grassroots perspectives on the adoption and impact of DFS in their communities.

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Table 2: Composition/number of key informants

| Affiliations | Overarching points for discussion <sup>2</sup> on:                                                              | Institutions/ Source of data         | Composition and Number of Participants for the Interview |
|--------------|-----------------------------------------------------------------------------------------------------------------|--------------------------------------|----------------------------------------------------------|
|              |                                                                                                                 |                                      | Composition/ Number                                      |
| Government   | ✓ The current policies and strategies in place to support the adoption of Digital Financial Services (DFS)      | • ATA                                | ✓ 2 Senior experts                                       |
|              | ✓ Observed impact of DFS on agricultural productivity                                                           | • Ministry of Agriculture            | ✓ 1 Senior expert and 1 official                         |
|              | ✓ Specific interventions or support mechanisms in place                                                         | • NBE                                | ✓ 2 Senior experts                                       |
|              | ✓ Plans or upcoming projects to enhance DFS                                                                     | • Ministry of Finance                | ✓ 1 Senior expert and 1 official                         |
|              | ✓ The current regulatory framework<br>✓ Trends and developments in the DFS                                      | • Ethiopian enterprises/ cooperation | ✓ 2 Senior experts                                       |
| Banks        | ✓ Bank's role in the development and implementation of Digital Financial Services (DFS) for smallholder farmers | • CBE                                | ✓ 1 Senior expert                                        |
|              | ✓ DFS products designed                                                                                         | • Dashen bank                        | ✓ 1 Senior expert                                        |
|              | ✓ Strategies to deploy DFS products                                                                             | • Oromia international               | ✓ 1 Senior expert                                        |
|              | ✓ Main challenges bank faces                                                                                    |                                      |                                                          |

<sup>2</sup> Details of the questions attached in the annex part

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|                          |                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                |                                                                                                                           |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
|                          | <ul style="list-style-type: none"> <li>✓ Digital literacy, poor network infrastructure, and trust in digital services</li> <li>✓ Innovative solutions</li> <li>✓ Security measures</li> <li>✓ Bank's future plans</li> </ul>                                                                                                                                                                        |                                                                                                                                |                                                                                                                           |
| Infrastructure providers | <ul style="list-style-type: none"> <li>✓ Company's role in providing infrastructure</li> <li>✓ Considerations when deploying infrastructure</li> <li>✓ Deployment Strategy</li> <li>✓ Main challenges</li> <li>✓ Innovative Solutions</li> <li>✓ Impact Assessment</li> <li>✓ Usage and Adoption</li> <li>✓ Security and Risk Management</li> <li>✓ Partnerships</li> <li>✓ Future Plans</li> </ul> | <ul style="list-style-type: none"> <li>• Safaricom</li> <li>• Ethio telecom</li> </ul>                                         | <ul style="list-style-type: none"> <li>✓ 1 Senior expert</li> <li>✓ 1 Senior expert</li> </ul>                            |
| Technology providers     | <ul style="list-style-type: none"> <li>✓ Role and Services</li> <li>✓ Target Audience</li> <li>✓ Technology Development and Deployment</li> <li>✓ Challenges and Solutions</li> <li>✓ Impact Assessment</li> <li>✓ Security and Risk Management</li> <li>✓ Collaboration and Support</li> <li>✓ Future Directions</li> </ul>                                                                        | <ul style="list-style-type: none"> <li>• Selected Fintec company (HelloCash)</li> <li>• M-pesa</li> <li>• Tele birr</li> </ul> | <ul style="list-style-type: none"> <li>✓ 1 Senior expert</li> <li>✓ 1 Senior expert</li> <li>✓ 1 Senior expert</li> </ul> |

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|                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                    |                         |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------|
| NGO and associations                         | <ul style="list-style-type: none"> <li>✓ Organization's role and mission in supporting smallholder farmers</li> <li>✓ Design programs and initiatives that integrate DFS for smallholder farmers</li> <li>✓ Impact of your DFS-related programs on smallholder farmers</li> <li>✓ Training and capacity-building activities</li> <li>✓ Ongoing needs and challenges</li> <li>✓ Organization's future plans for expanding and enhancing DFS initiative</li> </ul> | <ul style="list-style-type: none"> <li>• AACCSA</li> </ul>                         | ✓ 2 Senior experts      |
|                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <ul style="list-style-type: none"> <li>• Green digitization</li> </ul>             | ✓ 1 Senior expert       |
| Professional associations                    | <ul style="list-style-type: none"> <li>✓ Support mechanisms (e.g., workshops, seminars, online resources) to assist with DFS-related issues</li> <li>✓ Association's plans for expanding and enhancing DFS initiatives</li> <li>✓ Training and capacity-building activities</li> <li>✓ Association facilitates networking and knowledge-sharing</li> </ul>                                                                                                       | <ul style="list-style-type: none"> <li>• Ethiopian Economic Association</li> </ul> | ✓ 1 economics professor |
|                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <ul style="list-style-type: none"> <li>• Ethiopian Bankers Association</li> </ul>  | ✓ 1 senior expert       |
| Prominent academicians on the subject matter | <ul style="list-style-type: none"> <li>✓ The landscape of DFS evolving over the next decade</li> <li>✓ Existing gaps and challenges in DFS</li> <li>✓ Governments play in promoting DFS for smallholder farmers</li> <li>✓ Policy recommendations</li> <li>✓ The regulatory environment in developing countries</li> <li>✓ Key research findings on DFS</li> </ul>                                                                                               | <ul style="list-style-type: none"> <li>• From AAU</li> </ul>                       | ✓ 1 professor           |
|                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <ul style="list-style-type: none"> <li>• From private consultancy</li> </ul>       | ✓ 2 Senior experts      |

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|                         |                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                         |                                                           |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-----------------------------------------------------------|
|                         | ✓ DFS for smallholder farmers in developing countries                                                                                                                                                                                                                                                                                                                                |                                                                                         |                                                           |
| Farmers Representatives | <ul style="list-style-type: none"> <li>✓ Support or services do smallholder farmers need</li> <li>✓ Strategies do you use to ensure that farmers' voices</li> <li>✓ Infrastructure or logistical barriers exist</li> <li>✓ The main challenges smallholder farmers</li> <li>✓ Percentage of farmers in your community are currently using DFS</li> <li>✓ Awareness on DFS</li> </ul> | From Addis Ababa (Farmers and Urban Agriculture Development Commission) and Sheger City | ✓ 4 from Addis Ababa and Sheger City Farmers associations |
| <b>Total</b>            |                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                         | <b>28</b>                                                 |

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Key Informant Interviews provided:

- **Contextual Insights:** Deep understanding of the socio-economic and institutional context in which DFS operates for smallholder farmers.
- **Challenges and Opportunities:** Identification of key challenges faced by SHF in accessing and utilizing DFS, as well as potential opportunities for enhancing their impact.
- **Policy and Practice Recommendations:** Practical insights and recommendations from experienced stakeholders to inform policy and practice improvements in the deployment of DFS.

## 05.02.02: Survey

We conducted a comprehensive survey as a critical study component. This survey was meticulously designed to collect primary data, filling the identified gaps and providing robust insights into the strategic issues outlined in the TOR. To address DFS from the demand side perspective this method has been selected. Similar method has been employed by (Deresse & Zerihun, 2018; Peprah et al., 2020).

**Box 8:** Questionnaire Development:

**Structure:** Developed a structured questionnaire with sections covering demographics, financial behaviours, DFS usage, challenges, and perceived benefits.

**Types of Questions:** Included a mix of closed-ended questions for quantitative analysis and open-ended questions for qualitative insights.

**Pre-testing:** Conducted a pilot survey to test the questionnaire's clarity, relevance, and reliability, making adjustments as necessary.

The following summarizes the key methods for gathering the required information.

### *Types of Data*

- Qualitative Data: Insights, opinions, and perspectives gathered through interviews, FGDs, and observations.
- Quantitative Data: Numerical data obtained from various statistical records.

## Sample Selection and Description

To accurately represent smallholder farmers in Addis Ababa and the surrounding Sheger cities in the Oromia region, purposive sampling was used. The target population included smallholder farmers managing small plots of land for subsistence and small-scale commercial farming. This non-random sampling technique selects participants based on specific characteristics relevant to the research objectives, ensuring that the sample includes individuals who can provide rich,

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relevant, and diverse information. Consequently, the selected sample is well-suited to address the research objectives and provide detailed insights for the study.

Given the challenges in obtaining a comprehensive sampling frame and the specific objectives of the survey, a purposive sample of 156 smallholder farmers was selected. This sample offers valuable insights into the usage and current practices of Digital Financial Services (DFS). Enumerators received training to conduct face-to-face interviews using structured questionnaires. Data collection spanned various locations within Addis Ababa and the surrounding Sheger cities, ensuring extensive geographic representation. The questionnaires were administered using the Kobo Collect electronic method, which provides a robust and representative dataset. This approach enables the study to draw reliable and generalizable conclusions about the impact of DFS on smallholder farmers in the region.

Besides, aligned with Israel (1992) remarks that depict smaller sample sizes ranging from 30-100 can be sufficient to identify trends and provide preliminary insights. Marshall (1996) also indicated exploratory surveys often employ smaller samples to gather in-depth insights. The study's interest is to focus on acquiring information on the state of access to DFS for smallholder farmers in the country. Given resource, time, and security-related constraints, it turns out to be impractical to conduct a large-scale nationwide survey making Addis Ababa and its environs a safer, justifiable, and more feasible choice for data collection using a purposive sampling technique. The peri-urban and rural areas in and around Addis Ababa (Sheger City) provide a relevant context as they include farming communities that may have varying levels of access to DFS, enabling the study team to gather valuable insights into the state of access to DFS, identifying key barriers and opportunities in manageable scope. Yet, it is acknowledged that farmers in and around Addis Ababa may not represent the broader population of smallholder farmers in Ethiopia and particularly those in remote rural areas. Data triangulation from secondary information and other first-hand sources such as KIIs and observations was exploited to fill this very gap.

**Sample size distribution:** The samples for each city and sub-city were proportionally allocated based on the area size within each administrative unit. This area-based distribution has been chosen over a population size to deliberately give more weight/emphasis to the rural areas surrounding Addis Ababa where agriculture is predominantly practiced. Consequently, 41 households from Addis Ababa city and 115 smallholder farming households from Sheger city were sampled and interviewed using a structured questionnaire. The following tables provide a summary of the sample size distribution in both geographies.

*Table 3: Area-based sample size distribution by cities*

| City        | Total Area (Ha) | Area Proportion (%) | Total Sample Size (no.) | Area-based sample size per city (no.) | proportional distribution per city |
|-------------|-----------------|---------------------|-------------------------|---------------------------------------|------------------------------------|
| Addis Ababa | 51,978          | 27%                 | 156                     | 41                                    |                                    |
| Sheger      | 141,258         | 73%                 |                         | 115                                   |                                    |
| Total       | 193,236         | 100%                |                         | 156                                   |                                    |

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This area-based sample selection ensures a systematic, representative approach to surveying smallholder farmers in Addis Ababa and Sheger cities. By stratifying the sample and using proportional allocation, the study captured diverse experiences and practices, providing robust data for analyzing the impact of DFS.

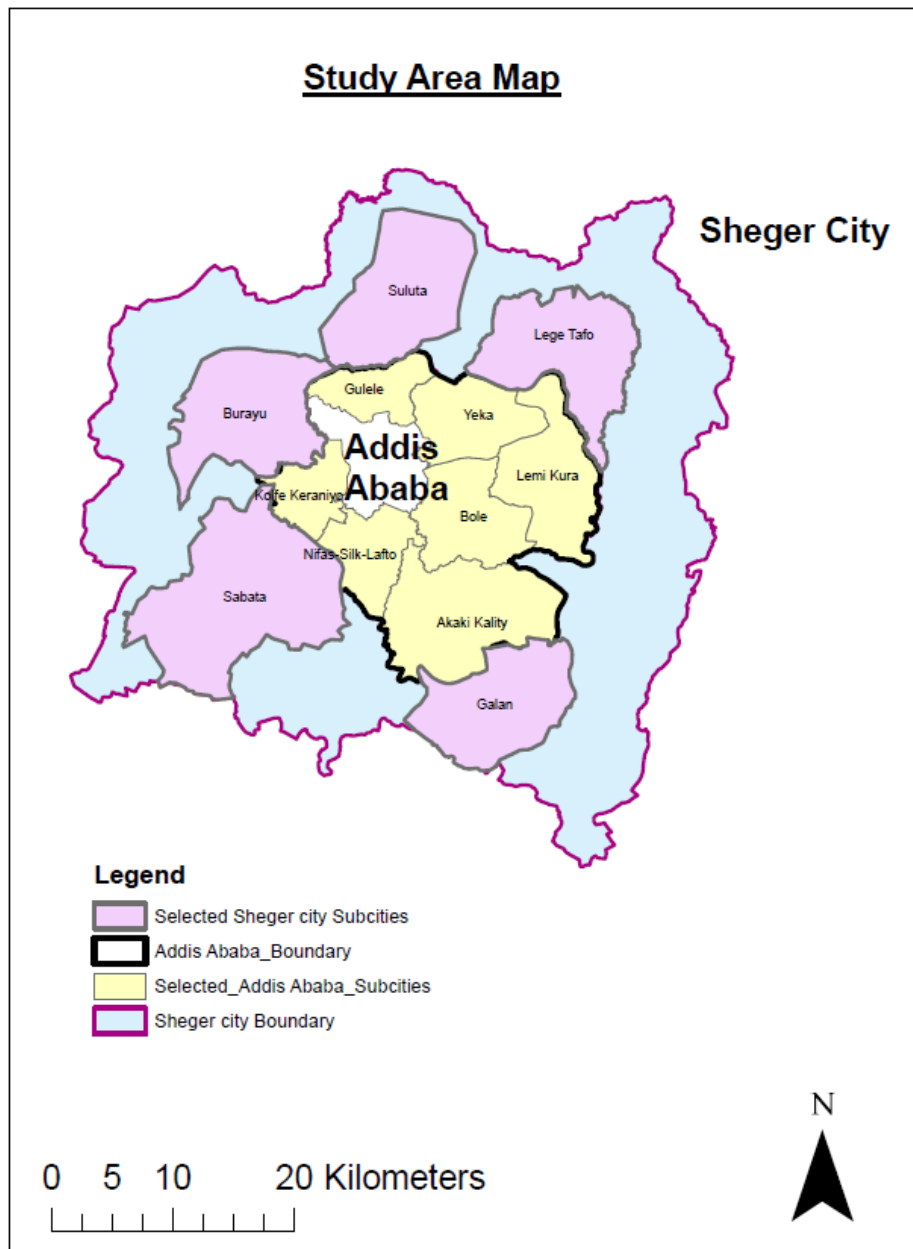
*Table 4: Area-based sample size distribution by sub-cities*

| Sub city           | Area (Ha)     | Percent     | Total sample size (no) | Sample distribution |
|--------------------|---------------|-------------|------------------------|---------------------|
| <b>Addis Ababa</b> |               |             | <b>41</b>              |                     |
| Bole               | 6,371         | 14%         |                        | 6                   |
| Lemi Kura          | 7,953         | 17%         |                        | 7                   |
| Yeka               | 5,676         | 12%         |                        | 5                   |
| Nifas-Silk-Lafto   | 5,163         | 11%         |                        | 6                   |
| Kolfe Keraniyo     | 4,954         | 11%         |                        | 6                   |
| Akaki Kality       | 12,398        | 27%         |                        | 11                  |
| <b>Sub total</b>   | <b>46,124</b> | <b>100%</b> |                        |                     |
| <b>Sheger</b>      |               |             | <b>115</b>             |                     |
| Legetafo           | 10,000        | 23%         |                        | 17                  |
| Burayu             | 6,809         | 15%         |                        | 19                  |
| Gelan              | 6,809         | 15%         |                        | 36                  |
| Sululta            | 14,000        | 32%         |                        | 17                  |
| Sebeta             | 6,809         | 15%         |                        | 26                  |
| <b>Sub total</b>   | <b>44,427</b> | <b>100%</b> | 156                    | <b>100</b>          |

Once the total sample size for each city was determined, the next step was to systematically and purposefully select sub-cities based on the dominance of agricultural practices and the presence of well-established administrative structures for easier access to farmers.

In the case of Addis Ababa, the study focuses exclusively on the expansion sub-cities adjacent to Sheger City, where urban agriculture is widely practiced. Consequently, central sub-cities such as Lideta, Kirkos, Addis Ketema, and Arada were excluded from the study.

For Sheger city, Legetafo, Burayu, Gelan, Sululta, and Sebeta sub-cities were purposively selected out of the twelve sub-cities. These areas previously functioned as independent city structures under the Oromia Special Zone surrounding Addis Ababa before Sheger City was established. The assumption was, smallholder farmers in these sub-cities can be more easily approached through the existing administrative routes compared to other sub-cities in Sheger (see the map below).



**Figure 3. Study area map and sampled sub-cities**

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**Box 9:** Issues to be addressed using a survey (see annex for details of questions)

- ✓ Demographic profile
- ✓ Key modalities of DFS
- ✓ Key factors that influence the adoption and usage of DFSs among rural farmers
- ✓ Access to mobile phones, access to mobile network coverage, reliable electricity, etc
- ✓ Status of DFS infrastructure and utilization
- ✓ Key challenges affecting DFS
- ✓ Financial inclusion levels, farm productivity, income,
- ✓ Key impacts of DFS on farmers' livelihood and overall well-being
- ✓ Other economic benefits such as:
  - o Ability to invest in essential inputs such as high-quality seeds, fertilizers, and modern farming equipment
  - o Ability to obtain better prices for products through DFS's secure and efficient digital payments

### 05.02.03: Desk review

The desk review method involves a comprehensive examination of existing literature, reports, and secondary data relevant to the study. This method aims to gather and analyze pre-existing information to inform the research context, identify knowledge gaps, and provide a foundation for primary data collection.

**Box 10:** Sources of Information:

**Academic Literature:** Peer-reviewed journal articles, theses, and dissertations on topics related to DFS, financial inclusion, and smallholder farming.

**Government Reports:** Publications from relevant ministries, such as the Ministry of Finance and the Ministry of Agriculture.

**Institutional Reports:** Studies and reports from international organizations, development agencies, and NGOs involved in DFS and agricultural development.

**Statistical Data:** Data from national statistics offices, financial institutions, and agricultural databases.

**Previous Studies:** Research conducted by other scholars and institutions on similar topics

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## 05.03: Qualitative and Quantitative Data Analysis

### i. Qualitative Data Analysis

**Thematic Analysis:** Identifying recurring themes, patterns, and insights from interview transcripts and qualitative responses.

**Content Analysis:** Analyzing textual data to extract meaningful information and identify emerging trends or issues.

**Coding and Categorization:** Organizing qualitative data into meaningful categories to facilitate interpretation and synthesis.

### ii. Quantitative Data Analysis

**Descriptive Statistics:** Calculating frequencies, percentages, and measures of central tendency to summarize quantitative survey data.

**Data Visualization:** Presenting quantitative findings using charts, graphs, and tables to enhance understanding and interpretation.

## 05.04: Data Quality Assurance

Not all questions were suitable for every institution, although the following sub-sections provide guidance on whom to interview. The checklists serve as a framework for conducting interviews, but it is not mandatory to adhere strictly to the questions. Analysts must determine which questions are most relevant to each specific context. Often, it is more important to pursue relevant lines of answers received during the interview than to rigidly follow a predetermined set of questions. As more interviews are conducted, questions can be chosen more selectively to fill in any knowledge gaps.

**Validity:** Ensuring that data collection instruments accurately measure the intended constructs and capture relevant information.

**Reliability:** Consistency and repeatability of data collection methods to produce reliable results over time and across different contexts.

**Triangulation:** Cross-verifying data collected from multiple sources or methods to enhance the credibility and robustness of findings.

**Peer Review:** Soliciting feedback and validation from peers and subject matter experts to ensure the accuracy and trustworthiness of data analysis and interpretation.

## 05.05: A summary of materials and methods

In conducting this study, we employed a multi-method approach to gather comprehensive and robust data on the impact of Digital Financial Services (DFS) on smallholder farmers in Addis

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Ababa and the surrounding Sheger cities in the Oromia region. The methods used include Key Informant Interviews (KII), a structured survey, and a thorough desk review. Each method is described briefly below:

**Key Informant Interviews (KII)**

Key Informant Interviews were conducted with a selection of individuals who possess specialized knowledge and insights about DFS and smallholder farming. These interviews included government officials, representatives from financial institutions, agricultural extension officers, and community leaders. The KIIs provided deep, qualitative insights into policy frameworks, implementation challenges, and the broader socio-economic context affecting DFS adoption among smallholder farmers.

**Survey**

A structured survey was conducted among smallholder farmers in Addis Ababa and the surrounding Sheger cities. The survey aimed to collect quantitative data on DFS usage, financial behaviours, and demographic information. A purposive sampling method was employed to select a representative sample of smallholder farmers, ensuring diversity in terms of geographic location, type of farming, and DFS adoption status. The survey data provided a statistical basis for analyzing trends, identifying barriers, and assessing the impact of DFS on the livelihoods of smallholder farmers.

**Desk Review**

A comprehensive desk review was carried out to gather and synthesize existing literature, reports, and secondary data relevant to the study. Sources included academic research, government publications, institutional reports, and statistical data. The desk review helped contextualize the study within the broader landscape of DFS and agricultural development, identifying key trends, gaps in existing knowledge, and areas requiring further investigation. This review informed the design of the primary research tools and provided a foundation for interpreting the primary data.

**Triangulation of Methods**

The triangulation of these methods ensured a holistic approach to the research. The desk review provided the necessary background and identified gaps that guided the formulation of survey questions and interview topics. The KIIs offered qualitative depth, complementing the quantitative data from the survey. This multi-method approach allowed for triangulation of data, enhancing the reliability and validity of the study's findings.

By combining these methods, the study provided a comprehensive and nuanced understanding of the impact of DFS on smallholder farmers in the target region, offering valuable insights for policymakers, practitioners, and stakeholders involved in promoting financial inclusion and agricultural development.

**Table 5: Key questions and methods: a summary**

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| Key Question Posed                                                                                                                                                                                                                                                                                                                             | Main Data Source                                                                                                                        | Data analysis                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| <b>Conduct Value Chain Analysis:</b> Undertake an extensive study of the value chain associated with digital financial services for smallholder farmers. This analysis considered technological aspects, financial products, and user experience to identify critical components and potential areas for improvement.                          | <ul style="list-style-type: none"> <li>✓ Interviews and Focus Groups</li> <li>✓ Literature Review</li> </ul>                            | <ul style="list-style-type: none"> <li>✓ Mapping the Value Chain</li> <li>✓ Conduct a SWOT</li> </ul> |
| <b>Key question:</b><br><br>What are the key components of the value chain associated with developing and implementing digital financial services for smallholder farmers?                                                                                                                                                                     |                                                                                                                                         |                                                                                                       |
| <b>Identify and Analyze Business Opportunities:</b> Identify and analyze specific business opportunities within the digital financial services industry, strategically focusing on creating pathways for young entrepreneurs. The analysis considered the financial needs and challenges of smallholder farmers to develop targeted solutions. | <ul style="list-style-type: none"> <li>✓ Survey</li> <li>✓ Interviews</li> <li>✓ Literature Review</li> <li>✓ Market Reports</li> </ul> | <ul style="list-style-type: none"> <li>✓ Descriptive Statistics</li> </ul>                            |
| <b>Key question:</b><br>What are the critical success factors for startups in the digital financial services sector, and how can these be leveraged to ensure sustainability and growth?                                                                                                                                                       |                                                                                                                                         |                                                                                                       |
| <b>Evaluate the Current State of Digital Financial Services:</b> Evaluate the current state of digital financial services for smallholder farmers in Ethiopia. This assessment was focused on sustainability, market trends, and the potential for entrepreneurial ventures to thrive in the sector.                                           | <ul style="list-style-type: none"> <li>✓ Survey</li> <li>✓ Market Reports</li> </ul>                                                    | <ul style="list-style-type: none"> <li>✓ Qualitative Data Analysis:</li> </ul>                        |
| <b>Key questions:</b><br><br>What are the main barriers to accessing digital financial services for smallholder farmers, and how can these barriers be overcome?<br><br>What are the attitudes, preferences, and behaviors of smallholder farmers towards digital                                                                              |                                                                                                                                         |                                                                                                       |

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| Key Question Posed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Main Data Source                                  | Data analysis                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|------------------------------------------------|
| financial services, and how do these impact adoption and usage?                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                   |                                                |
| <b>Develop Practical Recommendations:</b> Develop practical recommendations and guidelines to assist young entrepreneurs in establishing startups within the digital financial services sector. These recommendations emphasized inclusivity, user-friendliness, and sustainability to ensure the success and scalability of entrepreneurial ventures.                                                                                                                                                                                    | ✓ Desk Review<br>✓ Survey<br>✓ KII                | ✓ Statistical Analysis<br>✓ Component Analysis |
| <b>Key questions:</b><br><br>How do regulatory frameworks and policies affect the development and deployment of digital financial services for smallholder farmers in Ethiopia?<br><br>What are the potential business opportunities for young entrepreneurs in the digital financial services sector, and how can these opportunities be capitalized on?<br><br>How can digital financial services contribute to enhancing financial inclusion, agricultural productivity, and economic empowerment for smallholder farmers in Ethiopia? |                                                   |                                                |
| <b>Showcase Inspirational Success Stories:</b> Identify and showcase inspirational success stories from other African countries. These success stories will serve as valuable examples and sources of inspiration for young entrepreneurs in Ethiopia, highlighting best practices and lessons learned in the development of digital financial services for smallholder farmers.                                                                                                                                                          | ✓ Desk review<br>✓ Key Informant Interviews (KII) | ✓ Comparative Analysis                         |
| <b>Key questions:</b><br><br>What are the current trends and innovations in digital financial services globally, and how can these be adapted to the Ethiopian context?                                                                                                                                                                                                                                                                                                                                                                   |                                                   |                                                |

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| Key Question Posed | Main Data Source | Data analysis |
|--------------------|------------------|---------------|
|--------------------|------------------|---------------|

What are the successful case studies of startups in the digital financial services sector globally, and what lessons can be learned from these examples?

In a nutshell, to address the aforementioned research questions, a mixed-methods approach was employed, combining qualitative and quantitative data collection and analysis. Key methods include a survey of 156 purposively selected smallholder farmers in Addis Ababa and surrounding Sheger cities to gather quantitative data on DFS usage and impact. Additionally, key informant interviews (KII) with representatives from government institutions, banks, technology providers, and NGOs provide qualitative insights into the broader DFS landscape and challenges. A comprehensive desk review of existing literature and policy documents contextualizes the findings within global trends and Ethiopian-specific circumstances. This multi-faceted approach ensures a robust and comprehensive understanding of the potential for DFS to enhance financial inclusion, agricultural productivity, and economic empowerment among Ethiopian smallholder farmers.

## 06: Result and Discussion

This section presents and analyzes the key findings from the study, focusing on the adoption, usage, and perception of digital financial services (DFS) among smallholder farmers. The data collected through surveys, interviews, and document analysis provides insights into the current state of DFS in the study area, including access to mobile phones and the internet, digital literacy, and the challenges faced by users.

The discussion explores the implications of these findings, examining how factors such as mobile phone access, internet connectivity, financial literacy, and trust influence the adoption and effective use of DFS. Additionally, the analysis highlights the impact of DFS on improving financial inclusion, market access, and productivity for farmers, while also identifying areas where further support and infrastructure development are needed.

### 06.01: Descriptive statistics /Background

Smallholder farmers typically operate on small plots of land, often less than two hectares, relying primarily on family labor (Peprah et al., 2020). These farmers engage in subsistence and small-scale commercial farming, producing crops and livestock primarily for household consumption and local markets (Zerssa et al., 2021b). The following table provides summary statistics of the surveyed smallholder farmers, such as age, gender, education level, farm size, and crop type.

Table 6: Respondents distribution

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| Location           | Frequency  | Percent      |
|--------------------|------------|--------------|
| <b>Addis Ababa</b> |            |              |
| Akaki              | 11         | 7.1          |
| Bole               | 6          | 3.8          |
| Kolfe keraniyo     | 6          | 3.8          |
| Lemi kura          | 7          | 4.5          |
| Nifas silk lafto   | 6          | 3.8          |
| Yeka               | 5          | 3.2          |
| Addis Ababa        | 41         | 26.3         |
| <b>Shaggar</b>     |            |              |
| Sebeta             | 26         | 16.7         |
| Sululta            | 17         | 10.9         |
| Lege Tafo          | 17         | 10.9         |
| Galan              | 36         | 23.1         |
| Burayu             | 19         | 12.2         |
| <b>Shaggar</b>     | <b>115</b> | <b>73.7</b>  |
| <b>Total</b>       | <b>156</b> | <b>100.0</b> |

Results (see Table 7) from the 156 respondents showed that 26.3.9% (n =41), and 73.7 (n=115), were from Addis Ababa, and Shaggar respectively. The distribution of respondents across different locations shows significant variation. In Addis Ababa, 26.3% of the total sample (n=41) are residents, specific districts such as Akaki account for 7.1% (n=11), while Bole, Kolfe Keraniyo, and Nifas Silk Lafto each represent 3.8% (n=6) of respondents. Lemi Kura accounts for 4.5% (n=7), and Yeka for 3.2% (n=5). On the other hand, in Shaggar, which represents a larger portion of the total sample, 73.7% of respondents (n=115) are based because the majority of the residents are based on farming, as has been indicated in the method section of this report. This region includes sub-cities like Sebeta, which accounts for 16.7% (n=26) of the total respondents, and Sululta and Lege Tafo, both of which represent 10.9% (n=17) of the sample. Galan comprises 23.1% (n=36), while Burayu makes up 12.2% (n=19). Overall, Shaggar's

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respondents make up the majority, contributing 73.7% to the total sample (see the method section for more).

In total, the sample size across both Addis Ababa and Shaggar amounts to 156 respondents. This data reflects a larger representation of the Shaggar region compared to Addis Ababa. In the subsequent table, the demographic features of the respondents are listed and discussed.

*Table 7: Demographic characteristics of respondents*

| Variables      | Total (n=156) | Percent | Remarks                                                                 |
|----------------|---------------|---------|-------------------------------------------------------------------------|
| Male           | 138           | 88.5    |                                                                         |
| Female         | 18            | 11.5    |                                                                         |
| Age            |               |         |                                                                         |
| Below 18       | 2             | 1.28    |                                                                         |
| 19-30          | 6             | 3.85    |                                                                         |
| 31-40          | 46            | 29.49   | A large portion of respondents are in their productive middle-age years |
| 41-55          | 70            | 44.87   |                                                                         |
| Above 55       | 32            | 20.51   |                                                                         |
| Marital status |               |         |                                                                         |
| Married        | 98            | 62.8    |                                                                         |
| Single         | 36            | 23.0    |                                                                         |
| Divorce        | 14            | 8.9     |                                                                         |
| Separated      | 2             | 1.2     |                                                                         |
| Widowed        | 6             | 3.8     |                                                                         |
| Family size    |               |         |                                                                         |
| 1-3            | 13            | 8.4     |                                                                         |
| 4              | 37            | 23.7    |                                                                         |
| 5              | 43            | 27.6    |                                                                         |

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| Variables                   | Total (n=156) | Percent | Remarks                                                                                 |
|-----------------------------|---------------|---------|-----------------------------------------------------------------------------------------|
| 6                           | 25            | 16.0    |                                                                                         |
| 7-8                         | 28            | 19.2    |                                                                                         |
| Above 10                    | 8             | 5.1     | Very few respondents have extremely large families of more than 10 members.             |
| Education                   |               |         |                                                                                         |
| Degree and above            | 2             | 1.3     |                                                                                         |
| No formal education         | 38            | 24.4    |                                                                                         |
| Primary school              | 68            | 43.6    |                                                                                         |
| Secondary school            | 37            | 23.7    |                                                                                         |
| Vocational training diploma | 11            | 7.1     |                                                                                         |
| Farming years               |               |         |                                                                                         |
| Less than 5 years           | 4             | 2.6     | Very few respondents are relatively new to farming.                                     |
| 6-10 years                  | 50            | 32.1    |                                                                                         |
| More than 11 years          | 102           | 65.4    | The majority have extensive farming experience, indicating a mature farming population. |
| Income                      |               |         |                                                                                         |
| Below 4000                  | 61            | 39.1    |                                                                                         |
| 4001-8000                   | 17            | 11.5    |                                                                                         |
| 8001-20000                  | 25            | 16.0    |                                                                                         |
| Above 20000                 | 51            | 32.7    |                                                                                         |

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Of the total respondents, 88.5% are male, while 11.5% are female, highlighting that men are more likely than women to be part of the household's head, irrespective of the city's overall gender distribution. Women have less access to digital technologies and face additional barriers (Choruma et al., 2024). The majority of respondents fall within the 41-55 age group, closely followed by those aged 31-40, indicating that most respondents are from the working and middle-aged demographics of the study area. A research by Ljumović et al., (2021), found that the average user of digital financial services is younger, better educated, more frequently employed, and uses a variety of banking services, such as credit and debit cards, saving, and borrowing, more regularly than non-users of DFS and the overall public. To make financial inclusion more wide-ranging, governments should focus on the elderly population, which is less educated and out of the workforce. Almost 62.8% of the respondents are married. In terms of education, 38% of respondents lack formal education. Approximately 66% have completed primary education, with 37% having attained secondary education, and 11% holding a vocational training diploma. Additionally, 13% of the respondents live in households with 1-3 members, while 28% belong to families with 7-8 members. Moreover, as has been described above, the total sample size for the study conducted in Addis Ababa and Shegger city is 156 respondents. Regarding monthly income, 39.1% of the respondents (n=61) earn less than 4,000 Birr, while 11.5% (n=17) have a monthly income between 4,001 and 8,000 Birr. Additionally, 16% (n=25) of the respondents report earning between 8,001 and 20,000 Birr, and 32.7% (n=51) have an income exceeding 20,000 Birr. Regarding farming experience, 2.6% of the respondents (n=4) have been farming for less than 5 years, while 32.1% (n=50) have between 6 and 10 years of experience. The majority, 65.4% (n=102), have been farming for more than 11 years.

Digital Financial Services (DFS) use can be associated with several demographic factors based on the provided data. Firstly, income plays a significant role in the adoption of DFS (IFC, 2018). Respondents with higher incomes, particularly those earning above 20,000 Birr (32.7%), are more likely to engage with DFS due to their increased financial capacity and access to digital tools. Conversely, those earning less than 4,000 Birr (39.1%) may face barriers to accessing DFS, such as limited technological resources or digital literacy.

Farming experience also influences DFS usage. Farmers with over 11 years of experience (65.4%) may be more integrated into traditional banking systems. Still, with the growing availability of mobile and digital platforms, they could benefit from transitioning to DFS for managing transactions, loans, and payments. On the other hand, those with less than 5 years of farming experience (2.6%) might already be more inclined to adopt DFS, given their likely familiarity with technology in other aspects of life.

Additionally, gender and education levels are crucial in DFS adoption. With 88.5% of respondents being male, this demographic could show a higher likelihood of using DFS for household and farming-related financial activities. The education gap, where 38% of respondents have no formal education, suggests that efforts to promote DFS must include educational programs on digital literacy. Those with primary or secondary education (66% and 37%, respectively) and vocational training (11%) are better positioned to leverage DFS, as they are likely to be more digitally literate (Ljumović et al., 2021).

Finally, household size may affect DFS adoption. Respondents from larger families (28% with 7-8 members) might find DFS helpful in managing family-related expenses efficiently, while smaller households (13% with 1-3 members) could use DFS to track and control individual financial flows. All in all, key socio-demographic characteristics have influenced digital financial services (Ljumović et al., 2021).

## 06.02: DFS Adoption and Usage Patterns

Ensuring financial inclusion, deepening, and digitization are all complementary initiatives that NBE believes should also be at the center of its medium-term activities (NBE, 2017, 2020a). Efforts to broaden financial inclusion will not just focus on geographic reach and access points, but also on the widespread availability of products and services responsive to the needs of all categories of borrowers- irrespective of economic sector, business size, location, gender, or other factors. Moreover, beyond just payment systems, a key measure of success in this area will be the widespread growth of offerings related to savings, credit, insurance, and other products. Digitization is a tool that can accelerate and widen all such offerings and is thus to be promoted as a key enabler.

Adoption will depend on communities wanting adoption (Anne Marie van Swinderen, 2017b). A CBE expert asserts that the promotion of digital financial service remains insufficient, with current initiatives predominantly focused on urban centers, such as supporting petrol transactions. "This narrow focus has led to the marginalization of smallholder farmers, who are not receiving the attention or resources needed to benefit from DFS," the expert explained. "The disparity in promotional efforts is creating a significant gap in access, leaving rural populations underserved and highlighting the need for more inclusive and targeted outreach."

A CBE expert acknowledges that financial literacy is a significant constraint but argues that it cannot be solely blamed for the slow adoption of digital financial services. "While financial literacy issues exist, it is challenging to attribute the low uptake solely to this factor," the expert explained. "Many local farmers are already engaging with digital platforms like TikTok, WhatsApp, and Facebook, which suggests that the problem may be more complex than mere lack of knowledge."

Additionally, the expert highlighted the critical role of national ID in addressing issues related to collateral and account opening. "The implementation of a national ID system could resolve many obstacles associated with securing loans and opening accounts," the expert noted. "However, with only 2 million out of Ethiopia's over 120 million people currently registered, there is a substantial gap in coverage. Until the national ID system is expanded to reach a broader population, increasing the penetration rate of digital financing will remain a significant challenge."

The expert further emphasized the need for operational improvements to match regional advancements. "Many banks need to streamline their operations to be as efficient as those in neighboring countries like Kenya and Somaliland," they added. "These countries have made

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significant progress in digital financial services, and Ethiopia must enhance its practices to catch up and fully leverage the potential of DFS."

Table 8: CBE Digital Financial Services

| DFS                           | 2019/20   | 2020/21   | 2021/22    | 2022/23    | 2023/24    |
|-------------------------------|-----------|-----------|------------|------------|------------|
| Mobile banking <sup>3</sup>   | 739,127   | 1,495,012 | 3,027,775  | 5,369,452  | 10,059,387 |
| Growth rate                   |           | 102%      | 103%       | 77%        | 87%        |
| Internet banking <sup>4</sup> | 475       | 1,348     | 4,864      | 16,777     | 48,761     |
| Growth rate                   |           | 184%      | 261%       | 245%       | 191%       |
| Card Banking                  | 1,515,126 | 4,505,287 | 7,372,790  | 11,175,030 | 14,893,996 |
| Growth rate                   |           | 197%      | 64%        | 52%        | 33%        |
| CBE birr <sup>5</sup>         | 2,261,927 | 6,511,929 | 11,010,174 | 17,167,028 | 27,766,006 |
| Growth rate                   |           | 188%      | 69%        | 56%        | 62%        |
| Agent                         | 7,692     | 15,114    | 28,467     | 49,075     | 71,646     |
| Growth rate                   |           | 96%       | 88%        | 72%        | 46%        |
| Merchant                      | 10,540    | 27,151    | 61,389     | 94,922     | 134,923    |
| Growth rate                   |           | 158%      | 126%       | 55%        | 42%        |

Source: CBE, 2024

The data on the growth of Digital Financial Services (DFS) from 2019/20 to 2023/24 shows a substantial increase across various service types, indicating a significant shift toward digital financial inclusion. The number of mobile banking users grew from 739,127 in 2019/20 to 10,059,387 in 2023/24, reflecting an overall growth rate of 87% in the most recent year. This consistent upward trend indicates that mobile banking is becoming a key financial tool, offering convenience and accessibility to a broad range of users, particularly those without easy access to traditional banking services. The relatively high growth rates in earlier years (102%, 103%) suggest that mobile banking services were rapidly gaining popularity, especially as the infrastructure and digital literacy improved. Although the growth rate slightly decreased in 2022/23 (77%) and 2023/24 (87%), it still shows robust expansion as adoption becomes more widespread.

<sup>3</sup> Fund transfer, Bill Payment, Purchase, Airtime top up, wallet transfer, Other bank Transfer

<sup>4</sup> Bulk Payment, Fund transfer, Bill Payment, Purchase, Airtime top up

<sup>5</sup> Fund transfer, Bill Payment, Purchase, Airtime top up

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Internet banking experienced significant growth, from just 475 users in 2019/20 to 48,761 users in 2023/24, with particularly high growth rates (245% and 261%) in 2021/22 and 2022/23. This increase highlights the rising demand for more sophisticated, internet-based banking services among consumers and businesses, driven by improved internet connectivity and the need for remote financial management. Despite lower absolute numbers compared to mobile banking, internet banking is rapidly scaling, suggesting that more users are gaining access to high-speed internet, and trust in online transactions is increasing.

The use of card banking services grew from 1,515,126 in 2019/20 to 14,893,996 in 2023/24. Growth was particularly strong early on (197% in 2020/21) but has gradually slowed down, with a 33% increase in 2023/24. This indicates that while card banking is still expanding, it may be approaching saturation in certain markets. As card banking becomes more ubiquitous, the growth rate's decline might reflect that users are increasingly opting for other forms of DFS like mobile wallets, which provide more convenience for everyday transactions.

The CBE Birr service shows strong and steady growth, increasing from 2,261,927 users in 2019/20 to 27,766,006 in 2023/24. With a growth rate of 62% in 2023/24, it is clear that mobile money services are gaining immense traction, offering an inclusive financial service to individuals who may not have access to traditional banking infrastructure. The sustained high growth (188% in 2020/21) underscores the growing role of mobile money in financial transactions, particularly in rural or underserved regions.

Agent banking services, though smaller in scale, grew from 7,692 in 2019/20 to 71,646 in 2023/24. The high growth rates, particularly in 2021/22 (88%) and 2022/23 (72%), highlight the increasing reliance on agents to facilitate banking services in remote or rural areas where formal banking infrastructure is limited. Agent banking remains a critical channel for extending financial services to areas with limited internet or mobile coverage, offering a personal, accessible alternative to traditional banking.

Merchant services have also expanded, from 10,540 in 2019/20 to 134,923 in 2023/24, with substantial growth in the early years (158% in 2020/21) and steady growth in subsequent years. This indicates that businesses are increasingly integrating DFS into their operations, allowing for more efficient transactions and expanding market access. The slower growth in 2023/24 (42%) suggests that many merchants have already adopted digital payment systems, though there is still room for growth, particularly in smaller or informal businesses.

In sum, the consistent growth across all DFS platforms indicates a widespread adoption of digital financial services, driven by greater mobile and internet penetration, improved digital literacy, and growing trust in digital platforms. However, the slowing growth rates in certain services, such as card banking and merchant services, suggest a maturing market. Moving forward, continued efforts to enhance digital infrastructure, financial literacy, and trust in DFS will be crucial for sustaining and expanding this adoption, particularly in underserved and rural areas. Additionally, focusing on interoperability between different DFS platforms can further enhance user experience and drive future growth.

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Table 9: DFS transaction and value of CBE (in birr)

| DFS              | 2019/20           |                 | 2020/21           |                 | 2021/22           |                   | 2022/23           |                   | 2023/24           |                   |
|------------------|-------------------|-----------------|-------------------|-----------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|                  | No of transaction | Value           | No of transaction | Value           | No of transaction | Value             | No of transaction | Value             | No of transaction | Value             |
|                  |                   |                 |                   |                 |                   | 1,272,055,490,063 |                   |                   |                   |                   |
| Mobile banking   | 23,042,328        | 120,690,864,678 | 94,164,863        | 416,169,911,536 | 289,446,861       |                   | 747,807,251       | 3,818,353,170,625 | 1,515,568,040     | 9,429,658,048,788 |
|                  |                   |                 |                   |                 |                   | 160,604,702,179   |                   |                   |                   |                   |
| Internet banking | 522,728           | 39,044,300,655  | 694,779           | 55,954,167,839  | 1,013,743         |                   | 1,732,433         | 438,097,703,261   | 2,754,165         | 1,006,526,724,102 |
|                  |                   |                 |                   |                 |                   | 571,730,985,875   |                   |                   |                   |                   |
| ATM              | 136,699,064       | 125,581,064,689 | 330,450,742       | 329,733,437,860 | 540,837,192       |                   | 821,987,679       | 935,768,448,657   | 1,151,459,436     | 1,396,695,180,965 |
|                  |                   |                 |                   |                 |                   | 26,031,060,311    |                   |                   |                   |                   |
| CBE birr         | 46,943,301        | 6,245,836,301   | 122,651,391       | 17,936,168,170  | 156,600,964       |                   | 218,533,134       | 46,858,272,489    | 287,015,744       | 119,746,560,881   |
|                  |                   |                 |                   |                 |                   | 21,211,934,595    |                   |                   |                   |                   |
| POS              | 1,722,514         | 5,295,950,533   | 4,769,860         | 12,867,333,002  | 8,050,124         |                   | 15,269,690        | 39,260,531,250    | 24,307,233        | 65,108,398,322    |

Source: CBE, 2024

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Digital Financial Services (DFS) transactions and values from 2019/20 to 2023/24 highlight a notable trend in the increasing adoption of digital platforms across various services. The number of transactions in mobile banking surged from 23,042,328 in 2019/20 to 1,515,568,040 in 2023/24, accompanied by a significant rise in the value of transactions from 120.7 billion to 9.43 trillion. This exponential increase illustrates the rapid growth of mobile banking as a mainstream financial service. The convenience of mobile platforms has contributed to their adoption, enabling users to conduct a wide range of transactions, from simple transfers to complex payments, at their fingertips. The growth in both transaction numbers and value indicates a deepening trust in mobile banking services as users move from small, infrequent transactions to larger, higher-value activities, underscoring mobile banking's role in financial inclusion.

Internet banking transactions increased from 522,728 in 2019/20 to 2,754,165 in 2023/24, with transaction values growing significantly from 39 billion to 1.006 trillion over the same period. While Internet banking remains, a smaller segment compared to mobile banking, its growth rate is impressive, with users gradually embracing online platforms for financial management. The steep increase in value reflects that Internet banking is more commonly used for higher-value transactions, which is consistent with businesses and individuals using the platform for larger financial operations, rather than everyday consumer payments. The number of ATM transactions grew from 136,699,064 in 2019/20 to 1,151,459,436 in 2023/24, with a corresponding increase in transaction value from 125.6 billion to 1.39 trillion. ATMs continue to play a key role in facilitating cash-based transactions, even as digital alternatives expand. However, the slower growth in transaction value compared to mobile banking indicates that ATMs are more likely to be used for small to medium-sized withdrawals, as consumers shift larger payments to digital platforms. Although still highly utilized, the relatively lower value of ATM transactions signals a possible shift toward digital-first transactions as the overall ecosystem matures.

CBE Birr, a mobile money service, saw a significant rise in transactions from 46,943,301 in 2019/20 to 287,015,744 in 2023/24, while transaction value rose from 6.24 billion to 119.7 billion during the same period. This reflects strong growth in mobile money services, particularly in terms of transaction volumes, as CBE Birr continues to expand its reach among users with lower access to formal banking services. The increasing transaction values reflect growing trust in CBE Birr as a reliable medium for conducting financial transactions, especially in underserved or rural areas where formal banking services might be limited. Point on sale<sup>6</sup> (POS) transactions also expanded significantly, from 1,722,514 in 2019/20 to 24,307,233 in 2023/24, with the value of these transactions growing from 5.3 billion to 65.1 billion. This suggests that more merchants are adopting POS systems, enabling customers to make digital payments more conveniently in physical stores. The growing value of POS transactions indicates increasing consumer confidence in digital payment systems, particularly in retail and service sectors, which are crucial for transitioning from cash-heavy economies to digital payments.

In a nutshell, across all DFS categories, there has been a notable increase in both transaction volume and value over the five years, highlighting the rapid adoption and trust in digital financial services. Mobile banking and CBE Birr are leading the charge in terms of user adoption and

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<sup>6</sup> Buy goods at merchant and cash withdrawal at branch

transaction volumes, especially in rural areas and among unbanked populations. The growth in Internet banking and POS transactions indicates that businesses and consumers alike are embracing more sophisticated digital financial tools for both personal and commercial activities. Meanwhile, ATMs remain relevant, but the growing reliance on mobile platforms suggests a shift toward fully digital banking ecosystems. Going forward, further investments in digital infrastructure, security, and user education will be crucial to sustaining this momentum and expanding financial inclusion

Table 10: Respondents responses

| Items                                         | Frequency | Percent |
|-----------------------------------------------|-----------|---------|
| Do you have a mobile phone?                   |           |         |
| Yes                                           | 134       | 85.9    |
| No                                            | 22        | 14.1    |
| Awareness about DFS                           |           |         |
| Yes                                           | 104       | 66.7    |
| No                                            | 52        | 33.3    |
| Use of DFS                                    |           |         |
| Yes                                           | 93        | 59.6    |
| No                                            | 63        | 40.4    |
| How often use DFS                             |           |         |
| Daily                                         | 39        | 24.8    |
| Monthly                                       | 46        | 29.5    |
| Weekly                                        | 17        | 10.9    |
| Rarely                                        | 54        | 34.6    |
| If you have a mobile phone, what is the type? |           |         |
| Smartphone                                    | 58        | 37      |
| Feature phone/limited access to the Internet  | 47        | 30      |

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| Items                                  | Frequency | Percent |
|----------------------------------------|-----------|---------|
| Basic phone/talk/SMS only              | 51        | 32      |
| Access to the internet on mobile phone |           |         |
| No                                     | 84        | 53.8    |
| Yes, mobile data                       | 69        | 44.2    |
| Yes, Wifi                              | 3         | 1.9     |
| Do you have a formal bank account?     |           |         |
| Yes                                    | 149       | 95      |
| No                                     | 7         | 5       |
| Do you get training about DFS          |           |         |
| Yes                                    | 140       | 90      |
| No                                     | 16        | 10      |

The majority of respondents (85.9%, n=134) reported owning a mobile phone, while 14.1% (n=22) do not have one. Among those who own phones, 37% (n=58) use smartphones, 30% (n=47) have feature phones with limited internet access, and 32% (n=51) use basic phones that allow only calls and SMS. In terms of internet access on mobile phones, 53.8% (n=84) do not have internet access, while 44.2% (n=69) use mobile data, and only 1.9% (n=3) connect via WiFi. Regarding awareness of Digital Financial Services (DFS), 66.7% (n=104) are aware of DFS, while 33.3% (n=52) are not. Among the respondents, 59.6% (n=93) actively use DFS, whereas 40.4% (n=63) do not.

The frequency of DFS usage varies, with 24.8% (n=39) using it daily, 29.5% (n=46) using it monthly, 10.9% (n=17) using it weekly, and 34.6% (n=54) rarely using DFS. A significant majority, 95% (n=149), have formal bank accounts, while 5% (n=7) do not. Moreover, 90% of respondents (n=140) reported receiving training on DFS, whereas 10% (n=16) have not received any training.

Table 11: Which Digital Financial Service (DFS) do you use?

| Items                       | Frequency | Percent |
|-----------------------------|-----------|---------|
| Mobile money/Digital wallet | 35        | 22.4    |

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|                         |    |      |
|-------------------------|----|------|
| Agent banking           | 69 | 44.2 |
| Digital saving          | 17 | 10.9 |
| Digital loans           | 3  | 1.9  |
| Digital insurance       | 2  | 1.2  |
| Digital payment systems | 30 | 19.2 |

The usage of different Digital Financial Services (DFS) among respondents varies across several categories. Mobile money or digital wallets are used by 35 respondents. Agent banking is the most commonly used service, with 69 respondents utilizing it. Digital savings are used by 17 respondents, while digital loans and digital insurance are less prevalent, with only 3 and 2 respondents, respectively. Digital payment systems are employed by 30 respondents. This indicates that agent banking is the most favored DFS, while services like digital loans and insurance have limited adoption. The usage and adoption of Digital Financial Services (DFS) across various categories reflect significant trends and potential areas for growth in financial inclusion and digital literacy.

**High Mobile Phone Ownership but Limited Internet Access:** With 85.9% of respondents owning mobile phones, there's a strong foundation for DFS adoption. However, only 44.2% have access to mobile data, and 53.8% lack internet access altogether, suggesting that many rely on basic or feature phones with limited internet functionality. This poses a challenge for more advanced digital services that require consistent internet access, such as mobile banking apps or digital wallets. Expanding access to affordable mobile data or developing DFS platforms compatible with feature phones could significantly increase usage.

**Agent Banking as a Dominant Service:** Agent banking, used by 69 respondents, is the most widely adopted DFS. This indicates that physical agent networks are critical in bridging the gap for users who may not have regular access to formal banking services. The prominence of agent banking suggests that in areas with limited internet infrastructure, people still rely on intermediaries for digital transactions, demonstrating a preference for in-person assistance in navigating DFS.

**Limited Adoption of Advanced DFS Products:** More sophisticated DFS products like digital loans (3 respondents) and digital insurance (2 respondents) have very low adoption rates. This implies either a lack of awareness, trust, or accessibility to these services. The low usage of digital loans and insurance may also reflect apprehension toward credit products or a lack of tailored offerings that cater to the specific needs of lower-income or rural populations. Targeted awareness campaigns and simplified, user-friendly interfaces for these services could help drive adoption.

**Digital Payment Systems and Mobile Money:** Digital payment systems (30 respondents) and mobile money or digital wallets (35 respondents) also have moderate adoption, reflecting that

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cashless transactions are gradually gaining ground. However, the numbers are still relatively low compared to the potential. This suggests that more effort is needed to promote the convenience and security of digital payments, especially for small-scale transactions in rural or informal markets.

**Training and Awareness Gaps:** Despite 90% of respondents having received training on DFS, there is still a significant portion (33.3%) unaware of DFS, and 40.4% are not using it. This points to a gap between awareness and actual usage, potentially due to mistrust or difficulty in accessing the services. Further capacity-building efforts, alongside the promotion of successful use cases, could encourage those aware of DFS but hesitant to adopt it.

**Potential for Financial Inclusion:** With 95% of respondents holding formal bank accounts, there is an opportunity to expand the suite of digital services offered to this group, integrating DFS into their everyday financial activities. The use of digital savings (17 respondents) indicates a small but growing interest in saving through digital platforms, which could be encouraged further by improving user experience and ensuring transparency in digital financial transactions.

#### **Box 11:** Implications for Policy and Service Providers

##### Implications for Policy and Service Providers

**Focus on Accessibility:** Given the reliance on agent banking and limited internet access, DFS providers should focus on making their services available offline or with minimal data requirements.

**Increase Digital Literacy:** Although many respondents are trained, there is a need for continuous efforts in digital literacy programs to bridge the gap between awareness and active use of DFS.

**Develop Trust in Advanced DFS Products:** To expand the adoption of digital loans and insurance, service providers should focus on building trust, simplifying products, and addressing the specific needs of rural and lower-income populations.

**Encourage the Use of Digital Payments:** Promoting digital payment systems for day-to-day transactions could reduce reliance on cash, especially in urban and semi-urban areas.

Overall, the data suggests that while DFS has made inroads, there are significant opportunities to expand usage, particularly through improved infrastructure, targeted education, and the development of trust and accessibility in advanced digital financial services.

## **06.03: Respondent's Perception on usage and experience of DFS**

Understanding the perception and experience of users is crucial for assessing the effectiveness and adoption of Digital Financial Services, particularly in developing economies like Ethiopia. As DFS platforms aim to bridge gaps in financial inclusion by providing accessible, secure, and

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efficient financial solutions, the users' perspective offers valuable insights into the barriers and opportunities for further growth.

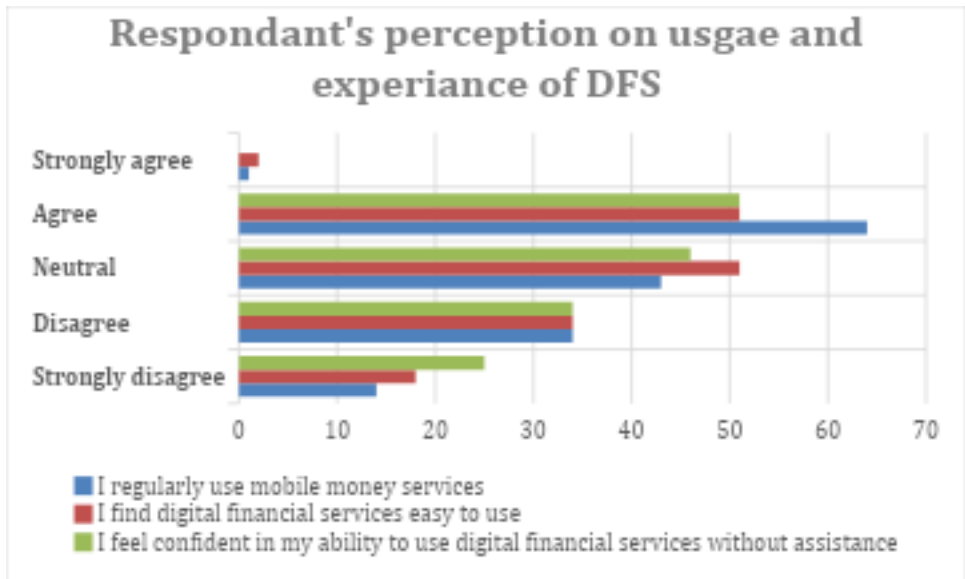


Figure 4: Respondents' Perception of the usage and experiences of DFS

The table presents the respondents' usage and experience of digital financial services, specifically focusing on mobile money services, ease of use, and confidence in utilizing these services without assistance. These aspects are evaluated on a Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), with the mean values calculated to reflect the overall perception. Hence, with a mean score of 3.03, the regular use of mobile money services is moderately positive. A significant number of respondents (64) agree at level 4, indicating that they frequently engage with mobile money services. However, a sizable portion of the population (34) remains neutral (level 3), while 34 respondents rank their usage at level 2, suggesting limited interaction with mobile money services. The moderate mean score reflects a growing adoption of mobile money services, but it also highlights that regular usage is not yet universal. This could be due to barriers such as a lack of trust, usability issues, or limited awareness of the full range of services available through mobile money platforms. Increasing trust and promoting the benefits of regular use could further enhance adoption rates, contributing to financial inclusion and convenience in everyday transactions (Anne Marie van Swinderen, 2017b; Howard Miller, 2019b; Sowa & Acquaye, 1999).

The ease of use of DFS has a mean score of 2.90, indicating a slightly lower level of agreement compared to regular usage. While 51 respondents (level 4) find DFS easy to use, 51 respondents remain neutral (level 3), and a notable 34 respondents (level 2) disagree that DFS is easy to use. The relatively lower mean score suggests that some users encounter challenges when using DFS, which may hinder their full engagement with digital platforms. These challenges could range from poor user interfaces to a lack of training on how to navigate DFS

platforms. Simplifying the user experience and providing comprehensive training to less technologically proficient users could enhance the overall ease of use and encourage more consistent usage.

Confidence in using DFS independently has the lowest mean score of 2.79. While 51 respondents (level 4) feel confident in their ability to use DFS without assistance, a large proportion of respondents (34) remain neutral, and 25 respondents (level 1) strongly disagree, indicating they lack confidence. The low confidence levels suggest that many users are not fully comfortable navigating DFS platforms on their own. This lack of confidence may be due to insufficient training, unfamiliarity with digital interfaces, or concerns about making errors during transactions. Enhancing users' confidence is crucial for increasing DFS adoption and ensuring that individuals can fully benefit from these services without relying on external help. Providing hands-on support, user-friendly guides, and customer service options can address this issue.

Overall, the data suggests that while there is moderate engagement with digital financial services, there are key areas that need improvement to foster greater usage and positive experiences. To increase regular usage, DFS providers and policymakers should focus on increasing the perceived ease of use and boosting confidence among users through accessible training programs could significantly enhance DFS adoption. This includes workshops, mobile tutorials, and customer support to guide new users.

Simplifying the DFS platforms by making interfaces more intuitive and user-friendly would make it easier for all demographic groups to use these services, particularly those with limited digital literacy. Addressing concerns related to trust and confidence by ensuring robust security measures, providing transparent processes, and offering fail-safe mechanisms could help users feel more secure in their independent usage of DFS.

By addressing these factors, the adoption and experience of DFS could improve, leading to greater financial inclusion and increased usage of digital financial tools in both urban and rural areas.

## 06.04: Key factors influencing adoption and usage of DFS

This section explores the critical factors that affect the adoption and usage of Digital Financial Services (DFS) among users, from the respondents' perspective. These factors include access to mobile phones, internet connectivity, digital and financial literacy, trust in digital platforms, and infrastructure challenges. By analyzing these elements, possible to understand the barriers and drivers that influence how users engage with DFS and identify areas where interventions may enhance adoption and effectiveness.

Table 12: Respondent's perception of factors influencing usage of DFS

| Items | Likert scale |   |   |   |   |      |
|-------|--------------|---|---|---|---|------|
|       | 1            | 2 | 3 | 4 | 5 | Mean |

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|                                                                                     |    |    |    |     |   |      |
|-------------------------------------------------------------------------------------|----|----|----|-----|---|------|
| Access to mobile phone                                                              | 4  | 40 | 42 | 65  | 5 | 3.17 |
| Internet and mobile connectivity (limited access to reliable networks)              | 1  | 26 | 57 | 66  | 6 | 3.32 |
| Digital literacy (low levels of digital skills)                                     | 1  | 8  | 40 | 100 | 7 | 3.67 |
| Financial literacy (limited understanding of financial products)                    | 0  | 8  | 44 | 96  | 8 | 3.67 |
| Trust and awareness (lack of knowledge and mistrust in digital services)            | 2  | 12 | 38 | 95  | 9 | 3.62 |
| Infrastructure (poor physical infrastructure like roads and unreliable electricity) | 3  | 28 | 60 | 60  | 5 | 3.23 |
| Service accessibility (few local agents or service points)                          | 1  | 15 | 52 | 85  | 3 | 3.47 |
| Affordability (high costs of devices and data plans)                                | 1  | 20 | 67 | 65  | 3 | 3.31 |
| Security and privacy concerns (fears of fraud and cyber threats)                    | 0  | 25 | 43 | 81  | 7 | 3.45 |
| Cultural factors (traditional practices and resistance to change)                   | 11 | 46 | 39 | 58  | 2 | 2.96 |

The table provides insights into the respondents' perceptions of the factors that influence their usage of digital financial services (DFS). Using a Likert scale, various factors such as access to mobile phones, internet connectivity, digital and financial literacy, trust, and infrastructure are evaluated. The mean score for each factor provides a snapshot of its perceived impact on DFS usage.

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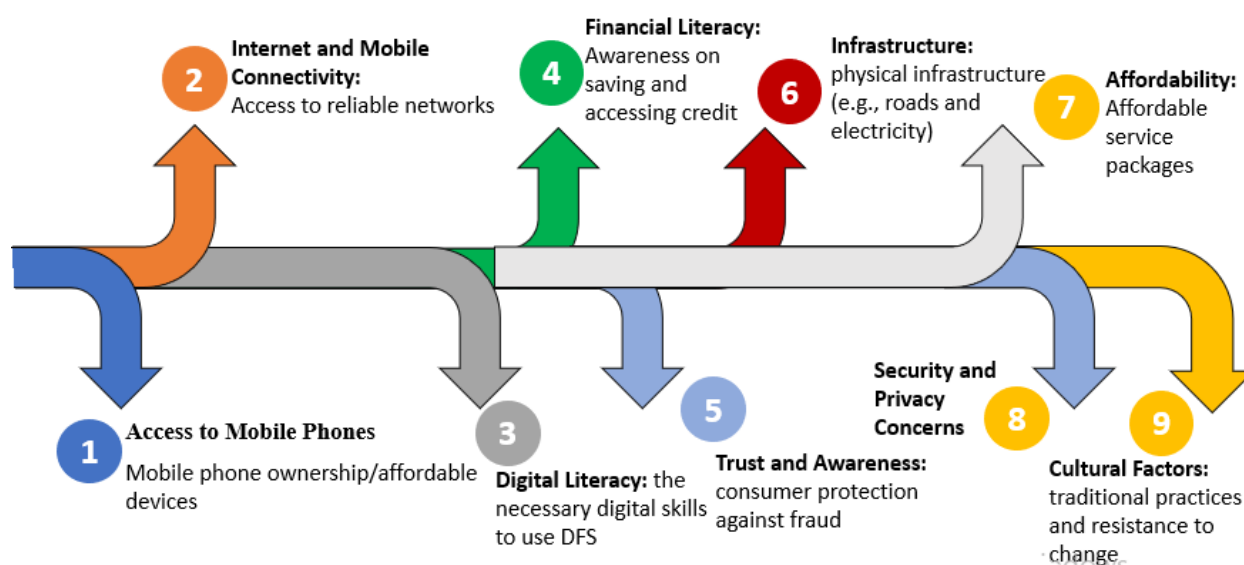


Figure 5: Identified factors influencing usage of DFS

### Access to Mobile Phones

With a mean of 3.17, access to mobile phones is seen as a moderately influential factor in the usage of DFS. While most respondents agree that having a mobile phone is essential for using DFS, the mean score suggests that some still struggle with mobile access. Only 5 respondents strongly agree (level 5), indicating that phone ownership is not yet universal in the study area. Although mobile phone ownership is widespread, further efforts are needed to bridge the gap for those without access. Providing affordable devices or promoting feature phone compatibility with DFS could help increase the user base. Given the low incomes of most small-scale farmers, it is difficult, if not impossible, to buy digital technology of their own accord (Smidt & Jokonya, 2022).

### Internet and Mobile Connectivity

Respondents rate internet and mobile connectivity as a slightly more significant factor, with a mean score of 3.32. The majority of respondents agree (level 4) that limited access to reliable networks hinders DFS usage. Reliable connectivity is crucial for using DFS efficiently. Poor network access can lead to frustration and transaction failures, deterring potential users. Investing in improving mobile and internet infrastructure in underserved areas could encourage wider DFS adoption (Smidt & Jokonya, 2022).

### Digital Literacy

Digital literacy emerges as one of the most influential factors with a mean of 3.67. A large number of respondents (100) agree (level 4) that low digital skills are a significant barrier to using DFS. This highlights the importance of improving digital literacy, especially in rural areas.

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DFS providers and policymakers must prioritize educational campaigns and training programs to equip users with the necessary digital skills (Abdulai et al., 2023; Choruma et al., 2024).

### **Financial Literacy**

Like digital literacy, financial literacy is perceived as a major factor, with the same mean score of 3.67. Respondents feel that a limited understanding of financial products restricts their ability to fully engage with DFS platforms. Expanding financial literacy initiatives is critical for ensuring that users can confidently navigate DFS and understand its potential benefits, such as saving and accessing credit (Gashaw Abate & Getnet Kindie, 2016). Partnerships between financial institutions and local communities could help raise awareness (Deresse & Zerihun, 2018). It is of course good to consider the institutional processes behind providing financial services to a rural customer can take a long time to implement (Howard Miller, 2019b).

### **Trust and Awareness**

The lack of trust and awareness in digital services is another key factor, with a mean score of 3.62. Many respondents feel that uncertainty or mistrust in DFS prevents them from engaging fully with these platforms. Building trust through transparent, secure platforms and offering consumer protection against fraud could help alleviate these concerns. Regular public awareness campaigns to explain the safety and benefits of DFS could also be effective. Building trust will be a sine qua non for successful DFS (Anne Marie van Swinderen, 2017b). Enforce robust security measures, and establish a regulatory framework for DFS integration into agriculture (Prodhan et al., 2024).

### **Infrastructure**

Respondents rate poor physical infrastructure (e.g., roads and electricity) as a moderately important factor, with a mean score of 3.23. Poor infrastructure can limit access to financial services, especially in rural areas. Improving physical infrastructure is crucial for expanding DFS access, particularly for remote populations. Reliable electricity and roads would enable users to visit service points and complete transactions more easily (Choruma et al., 2024).

### **Service Accessibility**

Service accessibility, including the availability of local agents or service points, receives a relatively high mean score of 3.47. A large number of respondents agree (85 at level 4) that limited service access affects their DFS usage. Expanding the network of DFS agents and service points in remote areas would likely increase usage. DFS operators should explore partnerships with local businesses to serve as agents or service facilitators (Smidt & Jokonya, 2022). Farmers, especially smallholder farmers operating on a plot size of one hectare (Ha) or less, and agribusinesses face chronic challenges of a limited supply of financial services including savings, credit, and insurance as well as to agricultural information and other related support services (IFC, 2018).

### **Affordability**

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Affordability, particularly the high costs of devices and data plans, has a mean score of 3.31. While some respondents agree that affordability is an issue, the score suggests that it is not the primary barrier to DFS usage. Lowering the costs of devices and data plans, possibly through government subsidies or partnerships with mobile operators, could help more people adopt DFS. Affordable service packages could also play a significant role in overcoming this barrier. Where farmers can access formal financial products, they are often available at unaffordable rates or are not designed to meet agricultural needs (IFC, 2018).

### **Security and Privacy Concerns**

Security and privacy concerns are another significant factor, with a mean of 3.45. Respondents worry about fraud and cyber threats, which may deter them from engaging with DFS platforms. Addressing security concerns through robust encryption, secure transactions, and user education could alleviate fears and build confidence in DFS. Clear guidelines on how to protect personal data should be disseminated widely. Gain trust by directly involving communities in design and promotion, particularly for designing the products and services but also for the onboarding system (Anne Marie van Swinderen, 2017b)

### **Cultural Factors**

Cultural factors, such as traditional practices and resistance to change, have the lowest mean score of 2.96. While some respondents view cultural factors as influential, they are not as critical as other barriers like digital literacy or trust. Although cultural factors are less significant, addressing them through community engagement and awareness campaigns could help ease the transition to digital services for more conservative populations (Deresse & Zerihun, 2018).

Overall, the data highlights that digital and financial literacy, trust, and infrastructure are the most critical factors influencing the usage of DFS in the study area. By addressing these key challenges through targeted interventions, such as improving literacy, expanding connectivity, and building trust, DFS providers can enhance adoption and usage, particularly in underserved regions. Ensuring that all users, regardless of location or socioeconomic status, have the tools and knowledge to benefit from DFS will be crucial for fostering financial inclusion and sustainability (Choruma et al., 2024).

A study by Choruma et al., (2024) conclude that the need improving digital literacy, enhancing infrastructure, addressing gender inequalities, and fostering innovation and entrepreneurship in digital agriculture.

## **06.05: Mapping the Value Chain and Key Actors**

Digital technologies enable small-scale farmers to reduce some constraints to participate in Agriculture Value Chains (AVCs) (Smidt & Jokonya, 2022). The chronic problems farmers face in terms of production capacity and quality, access to markets, improved trading positions, and higher incomes are interconnected with problems facing other agri-value chain actors at multiple levels. These farmer-centric problems are also a function of the overall composition and

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organization of the agri-value chains to which they are connected. (IFC, 2018). DFS has the potential to transform value chains across various sectors, especially in agriculture, where smallholder farmers and other stakeholders can benefit from improved access to financial tools. Understanding how DFS interacts with the value chain and identifying key actors is crucial for maximizing its impact. Present a detailed diagram or map of the agricultural value chain for smallholder farmers in Ethiopia, highlighting key stages such as input supply, production, processing, marketing, and distribution. List and describe the roles of different actors in the value chain, such as input suppliers, farmers, processors, transporters, and retailers. An academican from AAU stated that Digital Financial Services have the potential to significantly enhance value chain efficiency by offering more accessible financing options for input suppliers and farmers. With DFS, farmers can secure timely credit for purchasing essential inputs such as seeds, fertilizers, and equipment, without the delays and high costs associated with traditional financial services. Additionally, DFS facilitates improved transaction transparency, allowing all stakeholders in the value chain from input suppliers to buyers to track payments and transactions in real time, reducing the risk of fraud and ensuring smoother operations.

Moreover, ATA experts stated that DFS can help reduce transaction costs, particularly in remote and underserved areas. By digitizing payments, transportation, and cash-handling costs are minimized, enabling farmers to retain more of their earnings. The efficiency gains from reduced costs and increased transparency foster a more inclusive and robust agricultural value chain. DFS can also empower smallholder farmers by enabling better financial planning, improving their bargaining power, and providing access to formal savings and insurance products, further strengthening their role in the value chain. These improvements contribute to overall economic growth and development, especially in rural areas. Likewise, the Ethiopian farmer's cooperation director pointed out that, by integrating DFS into the agricultural value chain, Ethiopia can enhance productivity and competitiveness across the sector, ensuring that both farmers and suppliers benefit from more streamlined, transparent, and cost-effective financial transactions.

The CBE mobile banking director acknowledges the effectiveness of the gold and coffee value chain but notes that when it comes to digital financing, people prefer using cash. However, with the introduction of agents and the requirement for farmers to pay digitally for fertilizers, there has been a significant increase in the use of digital financial services.

A value chain represents the full range of activities that businesses and stakeholders go through to bring a product from its conception to its end use, including design, production, marketing, and delivery. In the agricultural context, the value chain covers input provision (seeds, fertilizers), production, processing, storage, distribution, and marketing. DFS can enhance this value chain by providing secure, efficient, and accessible financial transactions at every stage, helping actors overcome barriers like limited access to traditional banking and long transaction times.

#### **Box 12:** Key contributions of DFS in the value chain

**Efficient Payments:** Digital payments streamline transactions between suppliers, producers, processors, and distributors, reducing delays and lowering transaction costs.

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**Access to Credit:** Farmers, especially smallholders, often face difficulties accessing formal credit. DFS can offer microloans, digital credit, or crowdfunding options to improve liquidity.

**Insurance:** DFS platforms provide easy access to agricultural insurance products that can protect farmers from risks such as crop failure due to adverse weather.

**Market Access:** By facilitating digital marketplaces and payment platforms, DFS enables farmers and producers to connect more easily with buyers, thus increasing market reach and transparency (Prodhan et al., 2024).

**Data Analytics:** DFS platforms can collect valuable data on financial habits and needs, helping tailor products and services to specific value chain segments.

An academician from Addis Ababa University highlighted that digital financial services (DFS) have not yet made a significant contribution to the value chain, particularly in the agricultural sector for smallholder farmers in Ethiopia. The agricultural value chain remains underdeveloped, presenting a critical area that needs strengthening. In this context, the academician emphasized that DFS has the potential to play an important role in enhancing the agricultural value chain, particularly by improving financial access and efficiency for smallholder farmers. Strengthening this connection could drive better integration of smallholders into the broader economy, fostering growth and sustainability in the agricultural sector.

A representative from the Chamber emphasized that despite existing challenges, the outlook for Digital Financial Services (DFS) in value chain development remains highly promising. By addressing infrastructural gaps and enhancing digital literacy, DFS has the potential to:

Deepen economic integration for smallholder farmers, offering them greater access to broader markets and improving their competitiveness.

- Enable real-time financial transactions across various stages of the value chain, enhancing efficiency, reducing transaction times, and minimizing costs.
- Foster the development of a more inclusive financial landscape, ensuring that all stakeholders, from farmers to distributors, can leverage the financial tools necessary for growth and sustainability.

The representative further highlighted that as DFS continues to evolve, its role in transforming value chains, particularly in underserved sectors, will become even more crucial.

In summary, DFS has the potential to transform value chains by enhancing financial inclusion, streamlining payments, and providing innovative financial products (Prodhan et al., 2024). Mapping the value chain and identifying the role of key actors help to clarify where DFS can make the most significant impact, particularly in underserved sectors like smallholder agriculture.

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## 06.06: State of DFS and business opportunities

In developing economies, DFS plays a critical role in addressing financial inclusion by providing secure, efficient, and accessible financial solutions to underserved populations, including smallholder farmers, informal sector workers, and rural communities. Through platforms such as mobile banking, e-wallets, and digital payments, DFS is reshaping traditional financial ecosystems, enabling individuals and businesses to participate in the formal economy.

## 06.07: State of DFS

According to the 2021/22 NBE report, the financial sector has expanded considerably, with 30 commercial banks 18 insurance companies, 43 microfinance institutions and 6 capital goods lease companies were operating in the country.<sup>36</sup> However, 32.7% and 55.4% of the total bank and insurance branches were operating in Addis Ababa and majority of the formal financial institutions are operating in urban areas. Semi-formal financial institutions are saving and credit cooperatives, which are not regulated and supervised by the National Bank of Ethiopia (NBE) (NBE, 2020b, 2020a)

The digital financial services (DFS) sector in Ethiopia is undergoing a significant transformation, with a rapid rise in the adoption of mobile money and digital payment platforms. Spearheaded by key players such as Telebirr, CBE Birr, and HelloCash, these services are not only enhancing accessibility to financial services but are also playing a pivotal role in promoting financial inclusion, particularly in rural and underserved communities. The expansion of DFS is facilitating smoother, faster, and more secure transactions for individuals and businesses alike, fundamentally altering the traditional financial landscape. This section focuses on the current state of DFS in Ethiopia, examining its growth, challenges, and the critical role it plays in the country's digital and economic development, emphasis has been given to CBE and Tele-birr achievements and growth in DFS provision.

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Table 13: CBE Mobile banking users by regions

| Region              | 2019/20 |        | 2020/21 |         | 2021/22 |         | 2022/23   |         | 2023/24   |         |
|---------------------|---------|--------|---------|---------|---------|---------|-----------|---------|-----------|---------|
|                     | Male    | Female | Male    | Female  | Male    | Female  | Male      | Female  | Male      | Female  |
| Addis Ababa         | 108,618 | 52,100 | 212,408 | 113,788 | 379,086 | 216,341 | 822,144   | 579,612 | 1,563,493 | 982,049 |
| Afar                | 8,401   | 1,588  | 13,830  | 2,954   | 25,458  | 6,722   | 31,753    | 10,422  | 81,999    | 22,124  |
| Amhara              | 128,411 | 48,751 | 218,275 | 88,104  | 301,079 | 128,729 | 584,241   | 280,174 | 1,284,404 | 562,497 |
| Benshangul<br>Gumuz | 8,697   | 2,206  | 17,806  | 5,281   | 21,951  | 7,854   | 33,531    | 12,850  | 85,902    | 28,920  |
| Cental<br>Ethiopia  | 26,225  | 6,798  | 57,187  | 17,144  | 73,688  | 22,009  | 143,982   | 51,100  | 312,375   | 99,726  |
| Dire<br>Dawa        | 6,926   | 2,261  | 13,299  | 4,753   | 22,006  | 8,116   | 40,129    | 16,503  | 84,649    | 32,323  |
| Gambella            | 4,398   | 686    | 7,166   | 1,409   | 12,632  | 3,532   | 21,177    | 7,088   | 47,347    | 12,971  |
| Harari              | 3,641   | 1,412  | 7,772   | 3,189   | 10,967  | 4,006   | 24,324    | 10,406  | 48,207    | 19,571  |
| Oromiya             | 181,558 | 44,688 | 398,446 | 117,976 | 587,796 | 186,790 | 1,187,112 | 403,120 | 2,436,955 | 772,660 |
| Sidama              | 28,008  | 7,439  | 51,019  | 16,878  | 73,220  | 27,095  | 114,917   | 48,018  | 280,461   | 102,059 |

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| Region            | 2019/20 |         | 2020/21   |         | 2021/22   |         | 2022/23   |           | 2023/24   |                  |
|-------------------|---------|---------|-----------|---------|-----------|---------|-----------|-----------|-----------|------------------|
|                   | Male    | Female  | Male      | Female  | Male      | Female  | Male      | Female    | Male      | Female           |
| Somale            | 13,574  | 2,334   | 22,176    | 4,703   | 35,210    | 8,315   | 59,264    | 17,741    | 135,430   | 33,917           |
| South<br>Ethiopia | 40,013  | 9,348   | 82,306    | 25,078  | 108,852   | 35,815  | 170,511   | 64,148    | 421,467   | 138,274          |
| Swer              | 17,879  | 4,368   | 37,150    | 11,359  | 44,851    | 14,245  | 79,754    | 26,217    | 189,292   | 58,195           |
| Tigray            | 1,859   | 312     | 1,282     | 447     | 26,100    | 5,383   | 178,489   | 81,548    | 209,549   | 88,045           |
| Grand Total       | 578,208 | 184,291 | 1,140,122 | 413,063 | 1,722,896 | 674,952 | 3,491,328 | 1,608,947 | 7,181,530 | <b>2,953,331</b> |

Source: CBE

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The mobile banking user data of Commercial Bank of Ethiopia (CBE) from 2019/20 to 2023/24 shows substantial growth in both male and female user engagement across all regions. The capital city experienced a rapid increase in mobile banking users, growing from 160,718 in 2019/20 to 2,545,542 in 2023/24, with both male and female users showing substantial growth. Males consistently outnumber females, though the female user base has grown more than nine-fold during this period. This reflects both increased mobile banking penetration and a strong urban adoption rate driven by higher smartphone usage, internet access, and banking literacy. Afar showed significant but modest growth, with male users increasing from 8,401 to 81,999, and female users growing from 1,588 to 22,124. While growth has been steady, Afar's lower starting base and slower adoption rate relative to other regions may reflect infrastructural challenges, lower literacy rates, and less access to digital devices.

Amhara demonstrated a massive increase, particularly in male users (from 128,411 to 1,284,404) and female users (from 48,751 to 562,497). This increase highlights growing digital financial literacy and a shift towards more mobile-based financial services in the region. Amhara's agricultural base may benefit significantly from mobile banking, especially in remittances, payments, and financial inclusion efforts. This region saw considerable growth in mobile banking adoption, from 8,697 male and 2,206 female users in 2019/20 to 85,902 males and 28,920 females in 2023/24. Despite being a smaller region, the growth indicates increasing mobile banking access, likely supported by expanding mobile network infrastructure and digital literacy programs. Central Ethiopia's mobile banking user base grew significantly, with males increasing from 26,225 to 312,375, and females from 6,798 to 99,726. The region's large rural population is increasingly adopting mobile banking, which plays a critical role in facilitating transactions for agricultural markets and remittances.

Dire Dawa showed a notable increase, with male users growing from 6,926 to 84,649, and female users from 2,261 to 32,323. As a key commercial hub, the adoption of mobile banking is aligned with the growing demand for efficient financial transactions and the increased availability of digital financial services. Gambella's mobile banking user base expanded, though from a smaller base, with male users growing from 4,398 to 47,347, and female users from 686 to 12,971. The region's remote location and lower population density may explain the slower growth, but the increase indicates progress in digital financial inclusion efforts. Harari saw an increase in users, with male users growing from 3,641 to 48,207, and female users from 1,412 to 19,571. While Harari is one of the smaller regions, its growth reflects the successful integration of mobile banking into local economic activities, aided by improved digital infrastructure.

Oromiya experienced significant growth, particularly among males (from 181,558 to 2,436,955) and females (from 44,688 to 772,660). Oromiya, the largest region in Ethiopia, has a diverse economy that benefits from mobile banking, especially in agriculture, trade, and remittances. The increase in users demonstrates the region's successful integration of mobile financial services into everyday life. Sidama's user base grew substantially, with male users rising from 28,008 to 280,461, and female users from 7,439 to 102,059. The establishment of Sidama as a regional state likely contributed to increased access to digital services and financial inclusion efforts. Somale witnessed strong growth, with male users increasing from 13,574 to 135,430,

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and female users from 2,334 to 33,917. Despite the region's infrastructural and connectivity challenges, the growth reflects increasing mobile banking usage among pastoralist communities, driven by financial inclusion programs.

Southern Ethiopia saw considerable growth, with male users growing from 40,013 to 421,467, and female users from 9,348 to 138,274. The region's increasing engagement with mobile banking indicates growing financial inclusion, with mobile platforms facilitating transactions for agricultural and small-business activities. SWER experienced notable growth in mobile banking, with male users increasing from 17,879 to 189,292, and female users from 4,368 to 58,195. The region's growing user base signals expanding access to financial services through mobile platforms, particularly in rural areas. Tigray's mobile banking adoption was initially low but saw a steep increase in recent years, with male users growing from 1,859 to 209,549, and female users from 312 to 88,045. Despite conflict and challenges in the region, the adoption of mobile banking underscores the importance of digital financial services in crises, as well as the potential for rebuilding financial systems through digital platforms.

Overall, mobile banking usage has increased dramatically across all regions in Ethiopia, with male users generally outpacing female users in terms of adoption. However, the consistent growth among female users demonstrates ongoing efforts to bridge the gender gap in financial inclusion. The adoption of mobile banking is critical for enhancing access to financial services, particularly in rural and underserved areas, as it provides a convenient and accessible platform for managing finances, receiving remittances, and making payments. Continued investment in digital infrastructure, literacy programs, and targeted outreach will be essential to sustaining this growth and further expanding financial inclusion across Ethiopia.

The digital financial services sector in Ethiopia is rapidly growing, driven by key players such as Telebirr, CBE Birr, and HelloCash, among others. These providers are helping to bridge the gap in financial inclusion by offering mobile money and digital payment services to millions of Ethiopians, particularly in rural and underserved areas. The widespread adoption of these platforms is transforming the financial landscape, making it easier for individuals and businesses to conduct financial transactions securely and efficiently. As these services continue to expand, they are expected to play a critical role in Ethiopia's digital transformation and economic growth. In Ethiopia, the digital financial services (DFS) landscape has been evolving rapidly, with several key players providing various services to promote financial inclusion and digital payments. The following are the major digital financial institution providers in Ethiopia, along with their establishment details:

Table 14: Some Fintech and Digital financial institution providers

| Service Providers | Established in | Owners  | Remarks                                                          |
|-------------------|----------------|---------|------------------------------------------------------------------|
| Kefiya            | 2015           | Private | Kifiya launched its digital payment platform Lebul Mobile Wallet |

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|           |      |                                                                                                       |                                                                                                                                    |
|-----------|------|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Amole     | 2018 | Private (Dashen bank)                                                                                 | Amole provides digital payment services through its mobile app and platform.                                                       |
| M-Birr    | 2015 | Private (by a consortium of microfinance institutions (MFIs) including Aggar MFI, Omo MFI, PEACE MFI) | M-Birr was the first mobile money platform in Ethiopia and focuses on financial inclusion for low-income populations.              |
| Tele birr | 2021 | Public (Ethiotelecom)                                                                                 | Designed to offer a wide range of financial services including money transfers, bill payments, remittances, and merchant services. |
| CBE Birr  | 2017 | Public (Commercial Bank of Ethiopia)                                                                  | CBE Birr is a mobile money service                                                                                                 |
| Chapa     | 2020 | Private                                                                                               | Chapa focuses on enabling e-commerce transactions                                                                                  |
| HelloCash | 2015 | Private                                                                                               | allowing users to send money, pay bills, and perform other financial transactions via mobile phones                                |

Ethiopia's digital financial services sector is experiencing rapid growth, driven by key players like Telebirr, CBE Birr, and HelloCash. These platforms are crucial in bridging the financial inclusion gap, offering mobile money and digital payment services to millions, including those in rural and underserved areas. The adoption of these services is reshaping the financial landscape, facilitating secure and efficient transactions. As they continue to expand, these platforms are poised to play a significant role in Ethiopia's digital transformation and economic development. The need for fintech association is indispensable in the promotion of DFS and in achieving financial inclusion's FinTech Association of Kenya, the FinTech Association of Nigeria, the Mozambique FinTech Association, and many others. The country-level associations help foster connection and communication among FinTech companies/start-ups in their respective countries, thus promoting financial inclusion (Mapanje et al., 2023).

As of June 30, there are 107 million mobile accounts and 400,000 agent service providers. But we call them accounts not subscribers as the actual user number is only 31% of the 107 million

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people so still, we have to work on the efficiency (NBE). A CBE expert pointed out that the strong preference for cash, deeply rooted in traditional attitudes and practices, has contributed to a lower-than-expected adoption rate of digital financial services. Many individuals still rely on cash-based transactions, viewing them as more secure and familiar, which slows down the widespread acceptance of DFS in certain segments of the population. The expert emphasized that changing these ingrained behaviors is essential to increasing DFS penetration and realizing its full potential for financial inclusion and efficiency.

Table 15: Who are the DFS operators you have access to in your area?

| Operators                            | Frequency | Percent |
|--------------------------------------|-----------|---------|
| Telebirr                             | 50        | 32      |
| Hellocash                            | 14        | 8.9     |
| CBE/ other banks Mobile Banking      | 47        | 30      |
| CBE birr/other banks' digital wallet | 32        | 20.5    |
| M-Pesa                               | 2         | 1.3     |
| Other                                | 11        | 7.1     |

The data on Digital Financial Services (DFS) operators reveals several key players in the area. Telebirr is the most widely used DFS operator, with 32% of respondents (n=50) utilizing its services. This reflects the growing influence of Telebirr, likely due to its integration with mobile networks and ease of access. Telebirr's widespread usage positions it as a leading DFS operator, likely driven by its integration with mobile telecommunications and accessibility. This dominance presents an opportunity for expansion, particularly in rural areas, where mobile penetration is crucial for DFS growth. CBE (Commercial Bank of Ethiopia) and other banks' mobile banking services are also popular, used by 30% of respondents (n=47). This suggests that traditional banking institutions are actively participating in the DFS landscape, offering mobile-based services that attract a significant user base. The high adoption of CBE's mobile banking services suggests that traditional banking institutions have successfully adapted to the digital era. Their focus should be on enhancing user experience and expanding their customer base by offering competitive digital services.

CBE Birr and other digital wallets are used by 20.5% of respondents (n=32), indicating a growing acceptance of digital wallets for conducting transactions and managing finances. Meanwhile, Hellocash is utilized by 8.9% of respondents (n=14), showing its presence in the market, though it trails behind Telebirr and CBE's services.

M-Pesa, which is a dominant DFS operator in other African countries, has limited adoption in the area, with only 1.3% of respondents (n=2) using it. This suggests that while it may be available, its reach and influence are minimal compared to local services like Telebirr. Limited

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Role of M-Pesa: M-Pesa's limited presence (1.3%) highlights the strong competition from local DFS providers. This suggests that international operators may face challenges in penetrating the local market, where consumers prefer more localized services.

Finally, 7.1% of respondents (n=11) reported using other DFS operators, indicating that there is some diversity in the market, but the major operators dominate. Potential for Growth in Digital Wallets: The use of CBE Birr and other digital wallets at 20.5% indicates potential for growth, especially with increased awareness and adoption of mobile-based transactions.

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Table 16: CBE birr users by regions  
Source CBE, 2024

| Region           | 2020-2021 |         | 2021-2022 |         | 2022-2023 |           | 2023-2024 |           | 2023-2024 Total |           |
|------------------|-----------|---------|-----------|---------|-----------|-----------|-----------|-----------|-----------------|-----------|
|                  | Female    | Male    | Female    | Male    | Female    | Male      | Female    | Male      | Female          | Male      |
| Addis Ababa      | 505,362   | 779,001 | 632,829   | 848,078 | 1,081,374 | 1,554,880 | 1,445,492 | 2,063,386 | 3,508,878       | 9,477,322 |
| Afar             | 1,852     | 8,389   | 4,532     | 19,939  | 19,512    | 64,744    | 27,630    | 93,714    | 121,344         | 251,343   |
| Amhara           | 306,873   | 848,338 | 241,786   | 515,686 | 570,323   | 1,364,339 | 621,951   | 1,477,255 | 2,099,206       | 6,376,792 |
| Benshangul.Gumuz | 12,092    | 40,327  | 6,008     | 17,350  | 15,816    | 45,495    | 16,288    | 47,346    | 63,634          | 210,134   |
| Cental Ethiopia  | 58,947    | 185,608 | 49,985    | 151,829 | 104,067   | 326,303   | 100,027   | 331,684   | 431,711         | 1,348,273 |
| Dire Dawa        | 16,900    | 45,705  | 14,170    | 30,760  | 24,340    | 63,682    | 38,163    | 99,296    | 137,459         | 346,981   |

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|                |         |           |         |           |         |           |         |           |           |            |
|----------------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|-----------|------------|
| Gambella       | 2,305   | 8,443     | 4,653   | 11,870    | 16,989  | 42,053    | 14,558  | 40,301    | 54,859    | 144,561    |
| Harari         | 9,107   | 20,571    | 13,489  | 30,719    | 16,957  | 52,834    | 22,785  | 80,270    | 103,055   | 257,495    |
| Oromiya        | 444,810 | 1,392,270 | 388,407 | 1,126,417 | 728,030 | 2,271,790 | 830,414 | 2,635,912 | 3,466,326 | 10,404,778 |
| Sidama         | 68,127  | 262,669   | 33,047  | 67,952    | 69,904  | 189,655   | 96,290  | 245,727   | 342,017   | 1,165,394  |
| Somale         | 10,776  | 48,616    | 19,896  | 71,840    | 38,868  | 136,485   | 57,081  | 180,940   | 238,021   | 581,479    |
| South Ethiopia | 122,609 | 415,338   | 39,468  | 130,128   | 96,255  | 362,452   | 108,259 | 371,568   | 479,827   | 1,740,431  |
| Swet           | 29,635  | 102,795   | 21,434  | 85,285    | 41,361  | 153,935   | 48,409  | 178,769   | 227,178   | 682,964    |
| Tigray         | 34,301  | 72,810    | 42      | 99        | 2,569   | 8,566     | 56,493  | 132,062   | 188,555   | 355,442    |

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|             |           |           |           |           |           |           |           |           |            |            |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|
| Grand Total | 1,623,696 | 4,230,880 | 1,469,746 | 3,107,952 | 2,826,365 | 6,637,213 | 3,483,840 | 7,978,230 | 11,462,070 | 33,343,389 |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|

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The CBE Birr user data by region from 2020-2024 reveals a significant rise in both male and female users across Ethiopia, highlighting the growing adoption of mobile money services. Addis Ababa leads the growth in CBE Birr users, with female users increasing from 505,362 in 2020/21 to 1,445,492 in 2023/24, while male users rose from 779,001 to 2,063,386. The total number of users in the capital now stands at 3,508,878 females and 9,477,322 males. This rapid growth is driven by the city's high financial inclusion rates, better access to mobile devices, and robust infrastructure for digital transactions. Afar saw substantial growth in CBE Birr users, especially among males, who increased from 8,389 in 2020/21 to 93,714 in 2023/24. Female users grew from 1,852 to 27,630 during the same period. While the total user base remains smaller compared to other regions, the growth reflects increased efforts to promote digital financial services in remote and underserved areas, likely spurred by government and private sector interventions.

Amhara experienced one of the largest increases in CBE Birr users, with male users growing from 848,338 to 1,477,255, and female users rising from 306,873 to 621,951. The total number of users in 2023/24 reached 2,099,206 females and 6,376,792 males. The region's predominantly agricultural economy benefits from mobile money for transactions and remittances, helping to drive this strong uptake. Growth in Benshangul Gumuz, though more moderate, shows an increasing trend with female users increasing from 12,092 in 2020/21 to 16,288 in 2023/24, and male users from 40,327 to 47,346. The total user base is now 63,634 females and 210,134 males. This growth may be linked to efforts to improve financial access in this more remote region. Central Ethiopia has shown steady growth, with female users rising from 58,947 in 2020/21 to 100,027 in 2023/24, and male users growing from 185,608 to 331,684. The total user base is now 431,711 females and 1,348,273 males. This highlights the growing integration of mobile money services in both urban and rural settings in this region. Dire Dawa witnessed considerable growth in CBE Birr users, with female users increasing from 16,900 to 38,163 and male users from 45,705 to 99,296 over the four-year period. The total user base stands at 137,459 females and 346,981 males. As a commercial hub, Dire Dawa's adoption of mobile money is aligned with increased demand for efficient financial transactions. Gambella showed a significant rise in users, particularly among females, who grew from 2,305 in 2020/21 to 14,558 in 2023/24, and males from 8,443 to 40,301. The region now has a total of 54,859 female users and 144,561 male users, indicating improved access to mobile financial services in this remote area. Harari saw a steady increase in users, with female users rising from 9,107 to 22,785 and male users from 20,571 to 80,270 over the four years. The total user base is now 103,055 females and 257,495 males, reflecting the region's expanding digital financial landscape.

Oromiya experienced massive growth, becoming the largest region in terms of CBE Birr users. Male users increased from 1,392,270 in 2020/21 to 2,635,912 in 2023/24, while female users rose from 444,810 to 830,414. The region now has 3,466,326 female users and 10,404,778 male users. Oromiya's large population and diversified economy, coupled with expanding mobile network coverage, are key drivers of this growth. Sidama's user base grew significantly, with female users increasing from 68,127 to 96,290 and male users from 262,669 to 245,727. The total number of users is now 342,017 females and 1,165,394 males. The recent elevation of Sidama to regional status may have contributed to this uptick in digital financial service adoption. Somale saw strong growth, especially among males, who grew from 48,616 in 2020/21 to 180,940 in 2023/24, while female users increased from 10,776 to 57,081. The total number of users stands at 238,021 females and 581,479

males. The growth reflects increasing financial inclusion efforts in this region, where mobile money services are crucial for nomadic.

Southern Ethiopia saw a significant increase in users, with female users rising from 122,609 in 2020/21 to 108,259 in 2023/24, and male users from 415,338 to 371,568. The total number of users now stands at 479,827 females and 1,740,431 males, indicating expanding access to mobile financial services. SWER has experienced steady growth, with female users increasing from 29,635 to 48,409 and male users from 102,795 to 178,769 over the four years. The region now has 227,178 female users and 682,964 male users. This reflects ongoing efforts to extend financial services to underserved populations. Tigray, despite challenges posed by conflict, has seen a gradual increase in CBE Birr users, with female users growing from 34,301 to 56,493 and male users from 72,810 to 132,062. The total number of users is now 188,555 females and 355,442 males, underscoring the resilience of mobile financial services in post-conflict recovery.

Overall, the number of CBE Birr users has grown dramatically across Ethiopia from 2020 to 2024, with male users outpacing female users in most regions. The consistent rise in mobile money adoption reflects the increasing importance of digital financial services, particularly in facilitating transactions, remittances, and payments in both urban and rural areas. The growth also underscores the need for continued investment in infrastructure, financial literacy programs, and gender-targeted initiatives to further bridge the financial inclusion gap across Ethiopia (NBE, 2017, 2020a, 2020b).

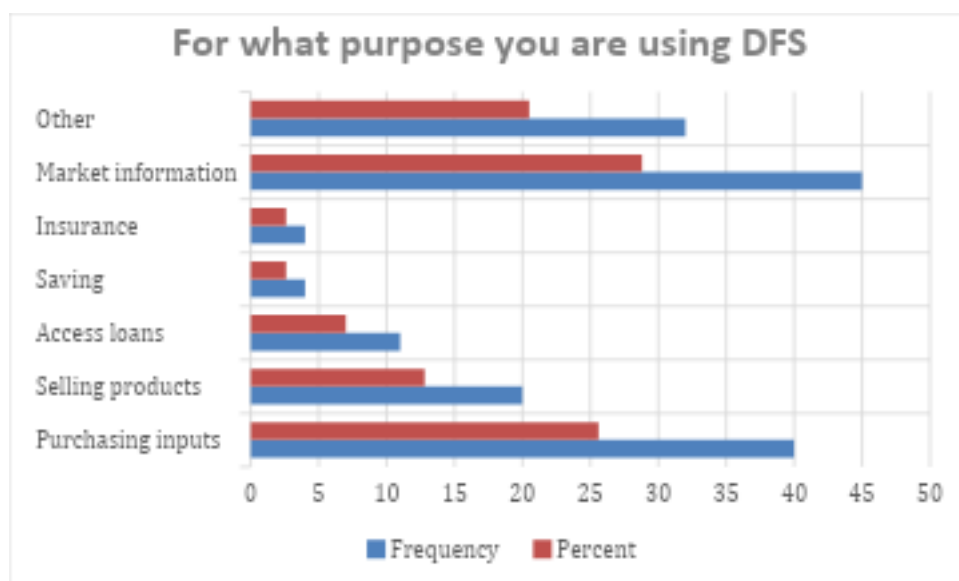


Figure 6: Purposes of using DFS

The data on the purposes for which Digital Financial Services (DFS) are used reveals a variety of applications across different sectors.

**Market Information:** The most common use of DFS is for accessing market information, with 28.8% of respondents (n=45) using DFS platforms to stay informed about market trends, prices, and other

relevant details. This suggests that DFS is playing a critical role in empowering users with timely information, which is crucial for decision-making, especially in agriculture and small businesses. The prominent use of DFS for market information reflects the value of these services in providing real-time data, which can improve productivity, reduce uncertainty, and empower users, especially in agricultural and informal markets (Smidt & Jokonya, 2022). DFS is extensively used for accessing market information (28.8%), highlighting its effectiveness in providing users with critical data to make informed decisions. This suggests that DFS platforms are well-integrated into the daily operations of businesses and farmers, supporting them in navigating market conditions and optimizing their strategies.

**Purchasing Inputs:** A significant portion of respondents (25.6%, n=40) use DFS for purchasing inputs such as seeds, fertilizers, or other materials required for farming or production. This highlights the role of DFS in facilitating quick and convenient transactions, enabling users to streamline their procurement processes. The significant use of DFS for purchasing inputs and selling products highlights its role in improving the ease and efficiency of commercial transactions. Expanding these services could further enhance local economies by reducing transaction costs and providing more convenient financial solutions. With 25.6% of respondents using DFS for purchasing inputs and 12.8% for selling products, DFS plays a significant role in streamlining commercial transactions. This adoption indicates that DFS is facilitating smoother, more efficient transactions, which is crucial for business operations and economic activities in the area.

**Selling Products:** 12.8% of respondents (n=20) use DFS for selling products, indicating that digital platforms are being leveraged to receive payments for goods and services. This shows that DFS is contributing to financial inclusion by enabling small businesses and farmers to engage in the digital marketplace.

**Accessing Loans:** A smaller portion of users, 7% (n=11), use DFS for accessing loans. Although this is relatively low, it suggests that digital lending services are available but might require more awareness, trust, or simpler procedures to encourage broader adoption. The low usage of DFS for accessing loans, savings, and insurance suggests there is a gap in awareness or trust in these advanced financial services. These areas present opportunities for financial institutions to tailor products that meet the needs of underserved populations and increase the adoption of these critical financial tools. The relatively low percentages of respondents using DFS for accessing loans (7%), savings (2.6%), and insurance (2.6%) suggest that these services are not as widely adopted. This could be due to factors such as lack of awareness, trust issues, or complexity in accessing these services.

**Saving and Insurance:** Both saving and insurance purposes account for 2.6% (n=4 each) of DFS use. These low percentages indicate that the uptake of digital savings and insurance products remains limited, possibly due to a lack of awareness or unfamiliarity with such services. These areas represent significant opportunities for growth, particularly through targeted awareness campaigns and product innovation tailored to local needs. Other Purposes: A notable 20.5% of respondents (n=32) report using DFS for other purposes not listed, which suggests there may be diverse and emerging uses of DFS that need to be further explored to understand user behavior. While DFS adoption is already substantial for market information and transactions, there is significant potential for expanding its role in savings, loans, and insurance, especially through education, trust-building, and improved service

delivery. The state of Digital Financial Services (DFS) in the study area reflects both significant advancements and notable gaps that present various business opportunities. The 20.5% of respondents using DFS for unspecified other purposes indicates a variety of applications that are not fully captured in the current categories. This suggests that DFS is evolving and being adapted for new uses, which may include niche or innovative applications not yet fully explored.

Table 17: Respondents' perception on access and awareness of DFS

| Items                                            | Likert scale |    |    |    |   | Mean |
|--------------------------------------------------|--------------|----|----|----|---|------|
|                                                  | 1            | 2  | 3  | 4  | 5 |      |
| I am aware of digital financial services         | 11           | 30 | 22 | 88 | 5 | 3.29 |
| I have access to a mobile phone                  | 10           | 21 | 45 | 77 | 3 | 3.27 |
| I have access to the internet on my mobile phone | 12           | 31 | 31 | 79 | 3 | 3.19 |

The table outlines respondents' perception of three key areas related to digital financial services (DFS): awareness of DFS, access to mobile phones, and access to the internet via mobile phones. The responses are measured on a Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), with a mean value calculated for each item. These factors are important indicators of the readiness of the population to adopt DFS, which plays a crucial role in financial inclusion, especially in the context of business promotion and economic development.

Hence, with a mean score of 3.29, awareness of DFS is generally positive, with the majority of respondents (88) ranking their awareness at level 4 (Agree). This suggests that there is a substantial level of understanding regarding the existence and functionality of digital financial services. However, the data also shows that a non-negligible segment of the population is less informed, with 30 respondents rating their awareness at level 2 (Disagree) and 11 respondents at level 1 (Strongly Disagree). This level of awareness demonstrates that most people are familiar with DFS, which is critical for adoption. However, the gaps in awareness indicate a need for targeted educational campaigns or initiatives to reach those who are less informed. Without proper knowledge, segments of the population may not fully benefit from DFS, limiting the overall impact on financial inclusion and urban economic resilience (Smidt & Jokonya, 2022).

The mean score of 3.27 suggests that most respondents have access to mobile phones, with 77 individuals agreeing at level 4. This high level of access is essential as mobile phones are the primary

tool for accessing DFS, particularly in areas where traditional banking services may be limited. The high mobile penetration aligns with efforts to promote digital financial services in urban and semi-urban areas. However, the respondents who ranked their access to mobile phones at lower levels (10 at level 1 and 21 at level 2) highlight the existing digital divide. To ensure equitable access to DFS, strategies such as subsidized mobile devices or community-based mobile services may be necessary.

Access to the internet via mobile phones scored a slightly lower mean of 3.19. While 79 respondents agreed (level 4) that they have internet access on their mobile devices, a notable proportion of respondents (31) indicated they face challenges accessing the internet, ranking their situation at level 2. Internet connectivity is crucial for the effective use of DFS, as it enables real-time transactions, access to market information, and broader financial services. The relatively lower score for internet access suggests that infrastructural limitations, such as poor network coverage or high data costs, may impede the adoption of DFS. Addressing these connectivity challenges is essential for expanding the reach of DFS and ensuring that financial inclusion and economic development efforts are inclusive and sustainable (Prodhan et al., 2024; Smidt & Jokonya, 2022).

The overall perception of access and awareness of DFS among the respondents is relatively positive, but there are clear gaps, particularly in internet access and awareness levels. To foster broader adoption of DFS, efforts should focus on closing these gaps by expanding outreach and education on the benefits of DFS, particularly targeting the 30% of respondents who have limited knowledge. Ensuring that infrastructure, particularly mobile and internet connectivity, is improved to support seamless access to DFS. This may involve partnerships between financial institutions, telecom companies, and local governments to provide better network coverage and affordable internet (IFC, 2018).

Therefore, special attention should be given to those who do not have access to mobile devices or the internet, as these individuals are at risk of exclusion from digital financial ecosystems. Addressing these challenges will play a critical role in leveraging DFS as a tool for sustainable economic development, ultimately contributing to financial inclusion, economic growth, and social equity.

## 06.07.01 Business opportunities for DFS

The growing digital financial services (DFS) sector in Ethiopia presents numerous business opportunities that can significantly drive economic growth and innovation. With increasing mobile phone penetration and internet connectivity, DFS providers are well-positioned to capitalize on several key areas.

As the survey results revealed that, with only 2.6% of respondents using DFS for savings and insurance, there is a significant opportunity to develop and promote digital savings accounts and insurance products. Financial institutions and DFS providers could introduce simplified and user-friendly products, increase awareness, and provide education on the benefits of these services to drive adoption.

Moreover, the low usage of DFS for loans (7%) points to potential growth in digital lending. By addressing barriers such as lack of trust or complicated application processes, providers can expand

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their reach. Tailoring loan products to meet the specific needs of local businesses and farmers, and ensuring transparency and ease of access, could attract more users.

Given the high utilization of DFS for market information, there is an opportunity to enhance these services further. DFS platforms could integrate more comprehensive market analytics, real-time updates, and personalized insights to provide greater value to users. Partnerships with agricultural organizations or business networks could also expand the reach and effectiveness of these services. Selecting the most suitable digital technological solutions and reaping the maximum benefits requires collaboration as local silo-based approaches often fail (Smidt & Jokonya, 2022).

With a significant portion of respondents lacking internet access (53.8%), improving internet infrastructure and mobile data accessibility could facilitate greater DFS adoption. Investments in technology infrastructure and partnerships with telecommunications providers could enhance service reach and reliability.

The diverse and emerging uses of DFS (20.5% for "other" purposes) suggest room for innovation. Providers can explore new applications and services tailored to local needs, such as specialized financial tools for small businesses or rural communities. Developing targeted solutions and conducting market research to identify unmet needs could drive further adoption and market penetration.

The subsequent business opportunities are identified based on key informants' suggestions and survey results:

#### **Box 13:** Key business opportunities for DFS

**Expanding Financial Inclusion:** There is a substantial untapped market, particularly in rural and underserved areas where traditional banking infrastructure is limited. By offering mobile money and digital payment solutions, DFS providers can reach millions of unbanked individuals, providing services like savings, loans, and insurance that are accessible via mobile devices (Choruma et al., 2024).

**Micro, Small, and Medium Enterprises (MSMEs):** Ethiopia's MSMEs face challenges in accessing formal financial services. DFS offers an opportunity to provide digital payment solutions, credit facilities, and financial management tools tailored to these enterprises. This can enhance their operational efficiency, expand their customer base, and improve access to credit.

**Agriculture and Supply Chain Finance:** Agriculture being a cornerstone of Ethiopia's economy, (Gashaw Tadesse Abate & Getnet, 2016), DFS can play a crucial role in digitizing agricultural transactions, facilitating mobile payments for farmers, and providing access to micro-loans and crop insurance (Anne Marie van Swinderen, 2017b). DFS can enhance productivity across the agricultural value chain by streamlining payments and reducing transaction costs.

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**Remittances and Cross-border Payments:** Ethiopia has a large diaspora community that sends remittances back home. DFS platforms can provide faster, cheaper, and more secure cross-border payment solutions, reducing reliance on informal remittance channels and benefiting both the senders and recipients. This presents a significant business opportunity for DFS providers looking to capture the remittance market.

**Government Payments and Social Transfers:** As governments increasingly shift towards digitizing public services, DFS can support the efficient distribution of social transfers, tax payments, and public sector salaries. This not only reduces administrative costs but also enhances transparency and accountability in government-to-person (G2P) transactions.

**E-commerce and Digital Marketplaces:** The rise of e-commerce in Ethiopia creates opportunities for DFS providers to integrate payment solutions with online platforms. By offering seamless, secure, and convenient payment options, DFS can support the growth of digital marketplaces, attracting more buyers and sellers into the formal economy.

**Partnerships with Telecom and Fintech Companies:** Collaboration between DFS providers and telecom or fintech companies can foster innovative product offerings, such as digital lending, peer-to-peer transfers, and mobile wallets. These partnerships can accelerate customer acquisition and scale DFS solutions more rapidly.

These opportunities include increased productivity and resource management, better access to information and market opportunities, adaptation to climate change, and the possibility of higher income and better living conditions (Choruma et al., 2024). Overall, the state of DFS in the study area shows a robust foundation with high utilization for market information and transactional purposes. However, there are clear opportunities to enhance the adoption of advanced financial services like digital savings, loans, and insurance. By addressing these gaps, improving infrastructure, and fostering innovation, there is significant potential to expand DFS usage and drive financial inclusion, ultimately contributing to economic growth and development in the region. The development of digital payment, money transfer systems, and the growing use of mobile phones has enabled financial institutions to design products that are accessible to a wide variety of users (Ljumović et al., 2021).

## 06.08: Impact on Financial Inclusion

Financial inclusion is the ease of access to, and the availability of, basic financial services to all members of the population. Financial inclusion means that individuals and businesses have access to useful and affordable financial products and services that meet their needs in a responsible and sustainable way (Ozili, 2020). The rise of digital financial services (DFS) in Ethiopia has had a profound impact on financial inclusion, particularly among previously unbanked and underserved populations. By leveraging mobile technology and innovative financial solutions, DFS has broken through traditional barriers, extending access to financial services to millions who were previously excluded from the formal banking system (Anne Marie van Swinderen, 2017b). Financial inclusion has

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an indispensable role in financial and monetary stability, combating antimoney laundering risks, accelerating economic growth, and generating prosperity and social development (Atta-Ankomah et al., 2024). It also promotes and increases saving; filling the gap in the ever-increasing credit demand and consequently promoting investment; creates employment opportunities, and rise in income that in turn contributes to poverty reduction (NBE, 2020a, 2020b). This section examines the extent to which DFS has improved financial access, particularly in rural areas, and evaluates its role in promoting economic empowerment, poverty alleviation, and overall social inclusion.

Key informants from CBE and Telebirr emphasized the transformative role of digital financial services in improving access to financial services for previously unbanked and underserved populations. They highlighted how DFS platforms have effectively broken-down traditional barriers, allowing millions of Ethiopians, particularly in rural areas to participate in the formal financial system for the first time. By offering accessible, secure, and user-friendly mobile banking solutions, DFS has not only expanded financial inclusion but has also empowered individuals to save, transfer money, and access credit without relying on conventional banks.

Likewise, key informants from NBE stated that DFS services are helping to foster economic independence and resilience, enabling small businesses, farmers, and households to engage more actively in the national economy. The rapid adoption of DFS is seen as a game-changer, unlocking new opportunities for financial empowerment and contributing to the broader goal of poverty reduction and economic growth.

One way of reaching the unreachable has been through agents. Hence, the number of Commercial Bank of Ethiopia (CBE) agents has grown steadily across regions from 2019 to 2024, indicating the bank's efforts to expand its network and increase financial access through agent banking services. In the subsequent table number of agents by region is presented and discussed.

Table 18: CBE number of agent's growth rate

| Region           | 2019-2020 | 2020-2021 | 2021-2022 | 2022-2023 | 2023-2024 |
|------------------|-----------|-----------|-----------|-----------|-----------|
| Addis Ababa      | 4,925     | 5,391     | 7,980     | 8,770     | 29,213    |
| Afar             | 148       | 260       | 227       | 229       | 917       |
| Amhara           | 3,882     | 5,355     | 6,757     | 4,396     | 22,324    |
| Benshangul Gumuz | 113       | 186       | 180       | 112       | 631       |
| Central Ethiopia | 831       | 972       | 1,003     | 817       | 3,839     |
| Dire Dawa        | 157       | 312       | 335       | 208       | 1,158     |
| Gambella         | 79        | 77        | 161       | 117       | 472       |

| Region             | 2019-2020     | 2020-2021     | 2021-2022     | 2022-2023     | 2023-2024      |
|--------------------|---------------|---------------|---------------|---------------|----------------|
| Harari             | 114           | 191           | 210           | 244           | 856            |
| Oromiya            | 4,523         | 6,115         | 7,716         | 7,254         | 28,009         |
| Sidama             | 535           | 687           | 744           | 728           | 3,061          |
| Somale             | 294           | 515           | 545           | 745           | 2,298          |
| South Ethiopia     | 1,171         | 1,097         | 1,511         | 1,198         | 5,391          |
| SWE                | 371           | 493           | 655           | 595           | 2,391          |
| Tigray             | 437           | 10            | 41            | 1,396         | 2,547          |
| <b>Grand Total</b> | <b>17,580</b> | <b>21,661</b> | <b>28,065</b> | <b>26,809</b> | <b>103,107</b> |

Source: CBE, 2024

The number of agents in Addis Ababa rose significantly from 4,925 in 2019/20 to 29,213 in 2023/24, reflecting a rapid expansion of CBE's agent network in the capital city. This sharp increase aligns with Addis Ababa's position as Ethiopia's largest economic hub, where demand for financial services is high, and the infrastructure allows more agents to operate effectively. Afar saw a modest increase in agents, growing from 148 in 2019/20 to 917 in 2023/24. While the growth is slower than other regions, it indicates a push to extend financial services into remote and underserved areas, where agent banking can serve as a bridge to formal banking.

Amhara experienced substantial growth, with the number of agents increasing from 3,882 in 2019/20 to 22,324 in 2023/24. This expansion underscores CBE's efforts to enhance financial access in one of Ethiopia's most populous regions, providing more banking services in both urban and rural areas. Benshangul Gumuz witnessed slower growth, with agents increasing from 113 in 2019/20 to 631 in 2023/24. The region, being less populated and remote, faces more challenges in expanding agent banking. However, the increase suggests a gradual improvement in financial outreach. In Central Ethiopia, agent numbers grew from 831 in 2019/20 to 3,839 in 2023/24. This expansion highlights the importance of agent banking in semi-urban and rural settings where traditional banking infrastructure may be limited. Dire Dawa saw a steady increase in agents, from 157 in 2019/20 to 1,158 in 2023/24. As a key commercial city, the rise in agents reflects the growing need for banking services in a business-heavy environment. Gambella's growth in agents was slower, increasing from 79 in 2019/20 to 472 in 2023/24. Similar to other remote regions, Gambella's lower population density and infrastructure limitations contribute to the slower pace of agent network expansion. The number of agents in Harari grew from 114 in 2019/20 to 856 in 2023/24, indicating steady progress in expanding financial services in this relatively small region.

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Oromiya saw one of the largest increases in agents, from 4,523 in 2019/20 to 28,009 in 2023/24. Oromiya, being Ethiopia's most populous region, has seen a massive push to expand agent banking services, which is crucial for reaching rural communities and supporting the region's economic activities. In Sidama, agent numbers increased from 535 in 2019/20 to 3,061 in 2023/24. The growth follows Sidama's recent designation as a new regional state, which likely contributed to an increased focus on expanding banking services in the area. The number of agents in Somale grew from 294 in 2019/20 to 2,298 in 2023/24. This reflects the increasing demand for financial services among the region's largely pastoralist population, where mobile banking agents play a critical role in bridging access gaps.

Southern Ethiopia saw steady growth, with agents increasing from 1,171 in 2019/20 to 5,391 in 2023/24. The expansion aligns with efforts to bring banking services closer to communities in the region, many of which are rural and underserved. SWER's agent network grew from 371 in 2019/20 to 2,391 in 2023/24, reflecting a strong push to improve access to banking services in this relatively new region, which was recently established as an autonomous region. Tigray experienced fluctuations due to the conflict, with the number of agents dropping to 10 in 2020/21 before rising again to 2,547 in 2023/24. The sharp recovery in the number of agents in 2022/23 suggests a restoration of banking services after disruptions caused by the conflict.

Overall, the number of CBE agents has seen significant growth across all regions, increasing from 17,580 in 2019/20 to 103,107 in 2023/24. This expansion demonstrates CBE's commitment to extending financial services through agent banking, particularly in rural and underserved regions. The massive increase in agents in regions like Oromiya, Amhara, and Addis Ababa is a direct response to the demand for banking services in these highly populated areas. Furthermore, regions affected by conflict, such as Tigray, are showing signs of recovery as banking networks are re-established. This broad expansion of agents is essential for improving financial inclusion and promoting economic development across Ethiopia.

The other DFS operator in ethio is Telebirr: Telebirr is proving to be a key driver of both Ethio Telecom's revenue growth and Ethiopia's push toward financial inclusion. With increasing customer adoption, the rise in transaction volumes, and significant contributions to Ethio Telecom's overall profitability, Telebirr is positioned as a critical DFS platform in Ethiopia. The expansion of Telebirr's services into more sectors and regions will likely continue to enhance its role in the Ethiopian economy, offering secure and convenient financial services to millions of users. Telebirr has emerged as a key player in Ethiopia's digital financial services (DFS) market, contributing significantly to Ethio Telecom's revenue, transactions, and overall digital transformation efforts. As per, Ethio Telecom 2016 EFY Annual Business Performance Summary, Ethio Telecom has seen rapid growth in its customer base, with telecommunication services reaching 78.3 million customers in 2023/24. Telebirr, as an integral part of this ecosystem, has likely contributed to this expansion by offering convenient mobile-based financial services to a large percentage of the population. Given that 99.2% of the population is covered by Ethio Telecom services, Telebirr has an enormous market potential. The 71% tele-density and broad geographical coverage suggest that Telebirr can reach both urban and rural populations effectively, helping drive financial inclusion. Ethio Telecom's revenue grew by 21.7% to reach 93.7 billion ETB as of June 2023, with DFS such as Telebirr playing a critical role in this growth.

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Telebirr has become a major contributor to revenue streams, particularly by facilitating transactions for users without access to traditional banking infrastructure.

#### Box 14: Telebirr Range of services

**Mobile Money Transfers:** Telebirr allows users to transfer money domestically with ease, making it a key platform for remittances and peer-to-peer transfers. This service has become particularly important for Ethiopians in rural areas, who can receive money from urban relatives or pay for goods and services without the need for physical cash.

**Utility Payments:** Users can pay for electricity, water, and other utilities directly through the Telebirr platform. This service adds convenience for millions of Ethiopians who traditionally had to visit physical locations to settle their bills, saving them time and effort.

**Merchant Services:** Telebirr also supports digital payments at various merchants, which is fostering the growth of cashless transactions in Ethiopia's retail and services sectors. The increasing adoption of Telebirr by merchants is contributing to the formalization and digitization of the economy.

**Government Services:** Telebirr is being integrated with government services, allowing citizens to pay for taxes, licenses, and other official services digitally. This reduces the need for long queues at government offices and enhances transparency in payments.

Source; Ethio Telecom 2016 EFY Annual Business Performance Summary

Telebirr has processed millions of transactions since its launch, reflecting its growing role in everyday financial activities. As Ethiopia transitions to a more digital economy, the volume of transactions on the platform is expected to increase further, contributing to the overall reduction of cash-based transactions in the economy. A case in point is in 2024 tele birr reached 47.55 million customers, with a transaction value of 2.55 trillion birr (Ethio Telecom 2016 EFY Annual Business Performance Summary). Ethio Telecom's broad 99.2% population coverage has been a significant factor in Telebirr's rapid scaling. With Telebirr leveraging this infrastructure, it can reach customers in remote areas where financial services have traditionally been limited. The platform's integration with various sectors, including retail, utilities, and government services, demonstrates its scalability and the potential to continue growing as more sectors digitize their transactions.

#### Box 15: Tele birr Financial Inclusion and Impact on the Economy

**Bridging the Financial Access Gap:** Telebirr plays a critical role in advancing financial inclusion by providing banking services to people who may not have access to traditional financial institutions. This has been especially impactful in rural and remote areas where the majority of the population is unbanked.

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**Support for Small Businesses:** The platform has provided small businesses with a safe, efficient, and cost-effective way to conduct transactions. As more merchants integrate Telebirr into their payment systems, it supports the growth of the informal economy and aids in its formalization by providing digital records of transactions.

**Digital Economy Driver:** By offering an easy-to-use digital payment platform, Telebirr is driving Ethiopia's transition to a cashless economy. This shift enhances economic transparency, reduces transaction costs, and improves efficiency, all of which are important for long-term economic growth.

*Source: Ethio Telecom 2016 EFY Annual Business Performance Summary*

In May 2021, EthioTelecom launched its mobile money service, namely, 'telebirr'. Reports suggested that one million subscribers had signed up for the mobile money service only one week after the launch. Telebirr is a digital cash that enables you to access various financial services easily, with convenience at the tip of your fingers using your mobile phone without needing a bank account. A Telebirr officer stated that their subscriber base has reached an impressive 47.5 million, surpassing their initial target by 107%. By facilitating the digitization of financial transactions through Telebirr, they have significantly advanced financial inclusion and accessibility across the country. During the past budget year alone, a total of 1.81 trillion birr was transacted through the platform, with cumulative transactions since its inception on May 11, 2021, amounting to an impressive 2.55 trillion birr. This milestone highlights Telebirr's pivotal role in reshaping the financial landscape and accelerating the digital economy.

Furthermore, the platform continues to play a critical role in streamlining transactions and making financial services more accessible to millions, enhancing individual and business capabilities within the economy. Telebirr's growth trajectory exemplifies the successful integration of technology and finance, empowering citizens while fostering economic growth. The emergence of digital financial systems has significantly changed the financial services space in SSA in ways that provide opportunities to promote financial inclusion among the poor, especially those in rural areas (Atta-Ankomah et al., 2024).

Overall, key players such as Telebirr, and CBE Birr, have contributed to bridging the financial gap, fostering greater participation in the formal economy, and driving sustainable economic growth. Avoid costly country-wide agent networks with low usage. Instead ensure that in local economies most of the population take up the services and use services for receiving, sending, paying, and being paid. Work through cashless islands, probably the kebeles are the best unit (Anne Marie van Swinderen, 2017b)

## 06.09: Impact on Agricultural Productivity

Digital financial services (DFS) are increasingly playing a pivotal role in enhancing agricultural productivity in Ethiopia. By providing farmers with improved access to financial tools such as mobile payments, digital savings, and micro-loans, DFS has enabled greater financial inclusion in the agricultural sector, where traditional banking services are often inaccessible (Zerssa et al., 2021b). This section explores the implications and opportunities of Farm Size. Additionally, the role of DFS in supporting farmers' livelihood, empowering smallholder farmers, and fostering economic resilience in

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rural communities was assessed. The analysis also highlights how farmers' perceptions is for future activities in the use of DFS.

## 06.10: Implications and Opportunities of Farm Size

An Ethio-Telebirr expert explains that in Oromia, the requirement for tax payments has contributed to the adoption of digital financial services (DFS). Over 1 million tax payments, including those from farmers, have been made via Telebirr. Similarly, fertilizer payment was done via telebirr and showed significant benefits.

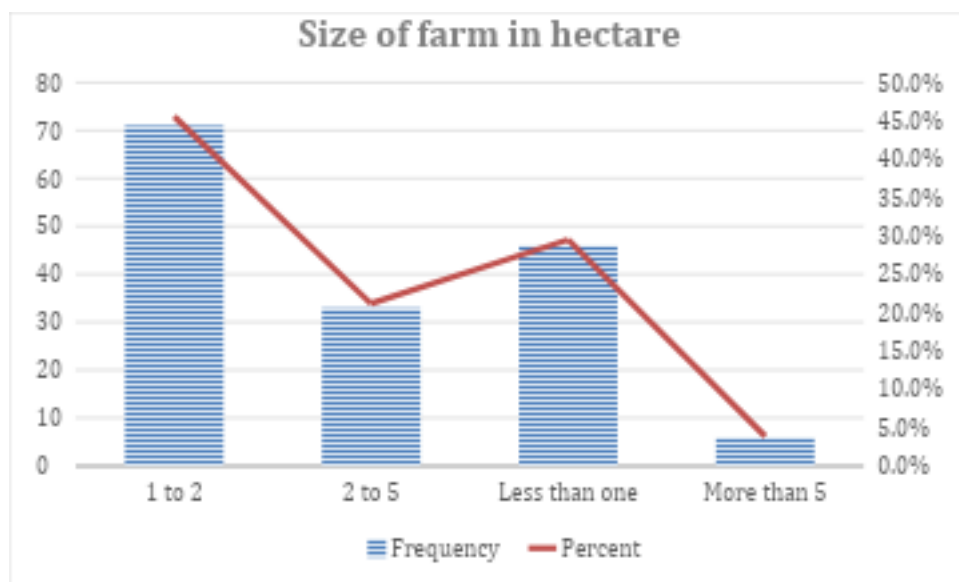


Figure 7: Size of Farm in hectares

The distribution of farm sizes in hectares reveals several key patterns. The largest proportion of respondents, 45.6% (n=71), manage farms within the 1 to 2-hectare range. This suggests that a significant number of farmers operate on relatively small plots of land, which is typical in many agricultural settings where smallholder farming is prevalent. A smaller segment of respondents, 21.2% (n=33), have farms ranging from 2 to 5 hectares. This group represents medium-sized farms, indicating that there are some farms with slightly larger areas, which could allow for more diversified production or higher output. A substantial 29.5% of respondents (n=46) manage farms of less than one hectare. This indicates a significant proportion of very small farms, which may face constraints related to scale and productivity. Small farm sizes often result in challenges such as limited resource availability and lower economies of scale. Only 3.8% of respondents (n=6) operate farms larger than 5 hectares. This relatively small percentage suggests that large-scale farming is less common in the area, possibly due to factors such as land availability, investment capacity, or market conditions.

### Box 16: Implications and Opportunities of Farm Size

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**Support for Smallholder Farmers:** The high proportion of small farms (45.6% between 1 to 2 hectares and 29.5% less than one hectare) highlights the need for targeted support programs. This could include access to microfinance, technical assistance, and resources to enhance productivity and income.

**Efficiency and Technology Adoption:** For farms less than 2 hectares, there is an opportunity to introduce technologies and practices that increase efficiency and yields. Implementing digital financial services for managing finances, accessing market information, and purchasing inputs could help smallholder farmers optimize their operations.

**Development of Market Linkages:** Small and medium-sized farms (1 to 5 hectares) may benefit from improved market linkages and value chain integration. Providing access to digital platforms for market information, sales, and supply chain management can help these farms better connect with markets and improve profitability.

**Scalability Challenges:** The limited number of larger farms (more than 5 hectares) suggests that there might be barriers to scaling up agricultural operations. Addressing issues such as land tenure, access to capital, and market access could encourage the development of larger, more commercially viable farms.

**Customized Financial Products:** With varying farm sizes, there is a need for financial products tailored to different scales of operation. Smallholder farmers might require microloans and savings options, while medium-sized and larger farms could benefit from more substantial financing and investment opportunities.

Overall, the distribution of farm sizes underscores the diverse needs within the agricultural sector and presents opportunities for tailored interventions to support different types of farming operations.

Table 19: What are the main reasons you use digital financial services?

| Items                               | Frequency | Percent |
|-------------------------------------|-----------|---------|
| Convenience                         | 35        | 22.4    |
| Security                            | 22        | 14.1    |
| Lower costs                         | 38        | 24.3    |
| Better access to financial products | 30        | 19.2    |
| Other                               | 31        | 19.8    |

As has been presented above, the primary reason for using DFS is cost-effectiveness, with 24.3% of respondents (n=38) citing lower costs as their main motivation. This indicates that DFS is valued for its

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ability to reduce transaction fees, service charges, and other financial costs, making it an attractive option for budget-conscious users (Howard Miller, 2019b). Convenience is also a significant factor, with 22.4% of respondents (n=35) using DFS because it simplifies their financial transactions. This reflects the appeal of digital platforms in providing easy access to financial services without the need for physical visits to banks or other financial institutions (IFC, 2018).

Better access to a range of financial products is another important reason, mentioned by 19.2% of respondents (n=30). This suggests that DFS platforms offer a wider variety of products and services compared to traditional methods, which can enhance users' ability to manage their finances effectively. Security is a key concern for 14.1% of respondents (n=22), who value DFS for its secure transaction capabilities. This highlights the importance of trust and security in digital financial transactions, which can be crucial for users transitioning from more traditional financial practices (Anne Marie van Swinderen, 2017b; Howard Miller, 2019b; IFC, 2018; Prodhan et al., 2024).

A notable 19.8% of respondents (n=31) cite other reasons for using DFS, indicating that there are additional, perhaps more personal or specific motivations for adopting these services. These reasons could include factors such as ease of record-keeping, faster transactions, or integration with other digital tools.

#### **Box 17:** Implications for DFS Providers

**Focus on Cost-Effectiveness:** The emphasis on lower costs underscores the need for DFS providers to continue offering competitive pricing structures and minimize transaction fees. Maintaining affordability can help attract and retain users.

**Enhance Convenience:** The significant role of convenience in DFS adoption highlights the importance of user-friendly platforms and services. Providers should focus on improving the ease of use, accessibility, and functionality of their services to meet user expectations.

**Expand Financial Product Offerings:** The demand for better access to financial products suggests that DFS platforms should diversify and expand their product offerings. Providing a range of financial products, such as savings accounts, loans, and insurance, can attract a broader user base.

**Emphasize Security:** The security concern indicates that DFS providers need to prioritize robust security measures and communicate these effectively to users. Building trust through secure transactions and data protection is crucial for increasing user confidence in DFS.

**Address Diverse Needs:** The category of "other reasons" suggests that users have varied and specific needs that may not be fully addressed by current DFS offerings. Providers should explore these diverse motivations to identify additional features or services that could enhance user satisfaction.

Overall, understanding these motivations allows DFS providers to tailor their services more effectively, addressing user concerns and preferences to improve adoption and usage.

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## 06.11: Future Farming Activities and DFS

Ethiopia's agricultural sector is primarily composed of smallholder farming systems, which account for over 90% of the country's agricultural production and occupy more than 90% of the total cultivated land (Zerssa et al., 2021b). As Ethiopia's agricultural sector continues to evolve, the integration of digital financial services (DFS) is poised to play a crucial role in shaping the future of farming activities. With advancements in mobile technology and increasing digital penetration, DFS offers the potential to revolutionize how farmers access financial services, manage resources, and interact with markets (IFC, 2018). Lack of access to financial services has a strong association with poverty, especially in lower-income countries. In the future, DFS could enable farmers to adopt precision agriculture practices, access real-time market data, and utilize digital platforms for more efficient supply chain management. Most of the respondents see DFS as future farming activities (see on fig below).

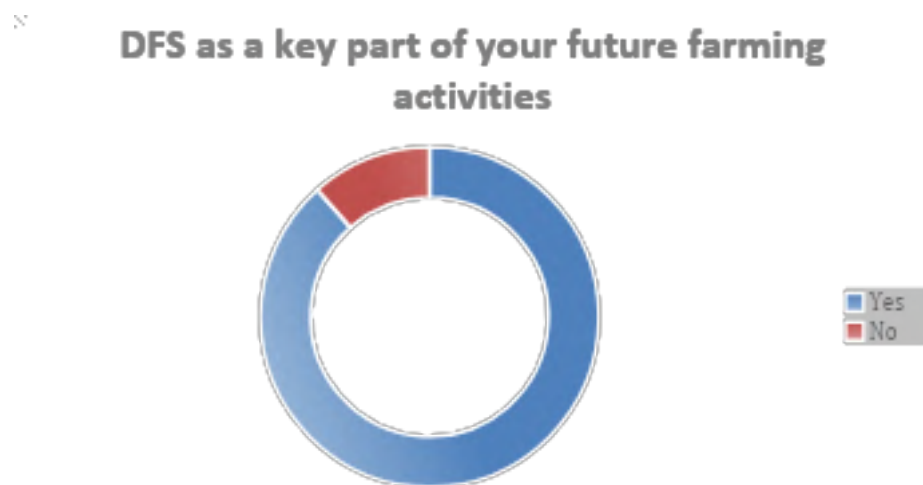


Figure 8: DFS as a key part of your future farming activities?

The above data indicates that a substantial majority of respondents view Digital Financial Services (DFS) as a crucial component of their future farming activities. Hence, an overwhelming 88.5% of respondents (n=138) believe that DFS will play a key role in their future farming activities. This strong endorsement suggests that farmers recognize the value of digital tools in enhancing their agricultural operations. The high level of acceptance indicates that DFS is expected to become an integral part of managing finances, accessing market information, and optimizing farming practices (Abdulai et al., 2023).

Conversely, 11.5% of respondents (n=18) do not see DFS as essential for their future farming activities. This minority might have reservations about digital tools due to factors such as lack of access to technology, limited digital literacy, or preference for traditional methods.

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## Box 18: Implications for Future Farming Activities

**Increased Investment in DFS:** Given the strong interest in integrating DFS into future farming activities, there is an opportunity for stakeholders to invest in and promote digital solutions tailored to agricultural needs. This could include developing specialized financial products, digital platforms for market access, and tools for managing farm operations.

**Enhancing Digital Literacy and Access:** To address the minority who do not see DFS as essential, efforts should be made to improve digital literacy and access. Providing training and support to help farmers understand and utilize DFS can increase adoption and maximize the benefits of these technologies.

**Tailoring Solutions to Agricultural Needs:** The positive outlook on DFS highlights the need for customized solutions that cater to the specific requirements of farmers. This could involve creating platforms for managing farm finances, accessing agricultural inputs, and connecting with buyers and suppliers.

**Monitoring and Evaluation:** It will be important to monitor the integration of DFS into farming practices and assess its impact on productivity and financial management. This can help identify successful strategies, areas for improvement, and the overall effectiveness of DFS in supporting agricultural development.

**Addressing Barriers:** For the 11.5% of respondents who do not see DFS as key to their future farming activities, understanding and addressing their concerns could help bridge the gap. This might involve addressing issues related to technology accessibility, cost, or perceived value.

In summary, the strong inclination towards using DFS in future farming activities reflects a significant opportunity for enhancing agricultural productivity and financial management through digital tools. By addressing challenges and tailoring solutions to meet farmers' needs, stakeholders can support the broader adoption of DFS in the agricultural sector (Anne Marie van Swinderen, 2017b; Howard Miller, 2019b; IFC, 2018).

## 06.12: DFS and Farmers livelihood

Digital financial services (DFS) have become a critical tool in improving the livelihoods of farmers across Ethiopia, offering accessible financial solutions that were previously out of reach for many rural communities. By facilitating secure and convenient mobile payments, access to micro-loans, and digital savings platforms, DFS is helping farmers better manage their finances, invest in productivity-enhancing tools, and cope with financial shocks. As farmers gain greater financial independence and stability, DFS contributes to improved food security, income diversification, and overall economic well-being in rural areas (Deresse & Zerihun, 2018). A study by (Atta-Ankomah et al., 2024) found that the strong effect of digital finance in promoting livelihood diversification among rural

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households is consistent for all rural households and rural agricultural households. The subsequent table highlights the impact of DFS on farmer's livelihood and overall well-being.

Table 20: Impact of DFS on farmers' livelihood and overall well-being

| Items                                                                                                          | Likert scale |    |    |    |    | Mean |
|----------------------------------------------------------------------------------------------------------------|--------------|----|----|----|----|------|
|                                                                                                                | 1            | 2  | 3  | 4  | 5  |      |
| Improved access to financial services (through credit/loans, savings)                                          | 0            | 10 | 51 | 79 | 16 | 3.65 |
| Enhanced and convenient market access (payment for goods and purchasing inputs)                                | 0            | 11 | 40 | 95 | 10 | 3.67 |
| Better risk management/insurance (through such as DFS-based access to microinsurance)                          | 1            | 20 | 47 | 82 | 6  | 3.46 |
| Increased efficiency and productivity through the use of mobile to access information and DFS for transactions | 0            | 13 | 41 | 91 | 11 | 3.64 |
| I can invest in essential inputs such as high-quality seeds, fertilizers, and modern farming equipment         | 0            | 11 | 37 | 91 | 17 | 3.73 |
| I can obtain better prices for products through DFS's secure and efficient digital payments                    | 0            | 17 | 44 | 80 | 15 | 3.60 |
| Using DFS has reduced the time I spend on financial transactions                                               | 1            | 12 | 41 | 69 | 33 | 3.78 |
| DFS has improved my ability to save money                                                                      | 0            | 13 | 37 | 84 | 22 | 3.74 |
| I feel that DFSs are secure and trustworthy                                                                    | 1            | 11 | 52 | 75 | 17 | 3.62 |
| DFS has generally enhanced my productivity and farming activities                                              | 1            | 9  | 43 | 92 | 11 | 3.66 |

The above table indicates the impact of DFS on various aspects of farmers' livelihood, using a Likert scale to gauge the respondents' level of agreement. Each item represents a different potential benefit of DFS, and the mean scores indicate the overall perceived importance or impact of these services. The majority of respondents agree that DFS has improved their access to financial services like credit, loans, and savings. With a mean of 3.65, farmers generally feel that DFS provides them with financial opportunities that were otherwise limited. By facilitating access to credit and savings, DFS helps farmers to manage their finances better and invest in productive activities. Expanding DFS to include more flexible loan options could further enhance this impact (Choruma et al., 2024).

The ability to use DFS for payments when selling goods and purchasing inputs is seen as a significant benefit, with a mean score of 3.67. Farmers appreciate the convenience and security that digital payments offer when engaging in market activities. DFS can play a crucial role in streamlining market transactions, reducing the need for cash, and minimizing risks associated with carrying large amounts of money. Encouraging further adoption could lead to greater market integration for farmers. On the other hand, respondents indicate that DFS-based access to microinsurance and other risk management tools has been moderately beneficial, with a mean of 3.46. This shows that while some farmers are taking advantage of these services, there is still room for improvement in terms of

adoption and awareness. Offering more affordable and accessible microinsurance products through DFS could help farmers better manage risks, such as crop failures or natural disasters, enhancing their financial resilience (Prodhan et al., 2024).

Using mobile phones to access market information and perform transactions via DFS is seen as a key factor in increasing farming efficiency and productivity, with a mean of 3.64. This reflects the potential of DFS to save time and resources by simplifying financial transactions and market interactions. Increasing awareness of the productivity gains that can be achieved through DFS may encourage more farmers to adopt these technologies, thereby boosting overall agricultural output.

DFS has enabled farmers to invest in essential agricultural inputs, such as high-quality seeds, fertilizers, and modern equipment, with a mean score of 3.73. This suggests that DFS is empowering farmers to make critical investments in their farming operations. Further expansion of DFS, particularly in offering tailored financial products for agriculture, could help more farmers improve their access to essential inputs, ultimately raising their productivity.

Respondents report that DFS has helped them obtain better prices for their produce through secure and efficient digital payments. With a mean of 3.60, this benefit is widely recognized among farmers. DFS can strengthen farmers' bargaining power in the marketplace by providing them with secure payment options. By ensuring timely and reliable payments, DFS can foster trust between buyers and sellers. In regards to, time Savings in Financial Transactions (Mean: 3.78), with the highest mean score of 3.78, reducing the time spent on financial transactions is one of the most valued impacts of DFS. Farmers appreciate the convenience and efficiency of digital transactions, which allow them to focus more on farming activities. Time savings are a major advantage of DFS, suggesting that farmers can allocate more resources to productivity and income-generating activities when they don't have to spend time on lengthy financial processes. Whereas, the ability to save money through DFS is another highly valued benefit, with a mean score of 3.74. Farmers feel that DFS has made it easier for them to manage their savings, helping them to accumulate resources for future investments or emergencies. Strengthening savings options within DFS platforms can further enhance the financial security of farmers, making it easier for them to build up capital for long-term goals (Anne Marie van Swinderen, 2017b).

Respondents generally feel that DFS are secure and trustworthy, with a mean score of 3.62. This suggests that most farmers have confidence in the safety of their financial transactions when using digital platforms. Continuing to prioritize security features in DFS, while educating users on how to protect themselves from fraud, could help maintain and increase trust in these systems. Finally, respondents agree that DFS has generally enhanced their productivity and farming activities, with a mean score of 3.66. The ease of accessing financial services and market information through DFS allows farmers to focus more on improving their agricultural practices. DFS plays a key role in supporting agricultural productivity by reducing financial and logistical barriers for farmers. Continued innovation in DFS tailored for the agricultural sector could further boost farming efficiency and output.

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Figure 9: Farmers at Shaggar City

The overall impact of DFS on farmers' livelihoods is positive, with substantial benefits in terms of financial inclusion, efficiency, productivity, and risk management. While the use of DFS has contributed to enhancing agricultural activities, there is still potential for further improvement in areas like access to microinsurance and expanding financial literacy. By addressing these gaps, DFS can become an even more powerful tool in transforming rural economies and improving the well-being of farmers.

## 06.13: Comparative Analysis

The rise of digital financial services (DFS) has revolutionized access to financial tools and inclusion across various regions. As countries develop and adopt DFS solutions, they experience differing levels of impact based on the maturity of their financial ecosystems, technological infrastructure, and regulatory environments. This comparative analysis examines the state of DFS in Ethiopia, Kenya, Ghana, India, and Bangladesh, providing insights into how these nations have leveraged DFS to enhance financial inclusion, support economic growth, and address challenges in their unique contexts.

Ethiopia, a nation in the early stages of DFS development, faces significant opportunities and challenges in expanding financial access, particularly in rural areas. Kenya, a leader in mobile money adoption with its widely recognized M-Pesa platform, serves as a benchmark for high DFS adoption and integration. Ghana, with its growing mobile money services, presents a case of moderate adoption and its associated impacts. India, with its extensive range of DFS offerings and significant government initiatives, exemplifies a high level of financial inclusion and economic empowerment. Bangladesh, known for its innovative approach to mobile money and microfinance, offers a model of successful DFS integration in a rural setting.

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## 06.14: Ethiopia Vs Kenya

The agricultural sectors of Ethiopia and Kenya are both vital to their economies, yet the adoption and impact of digital financial services (DFS) in these countries have taken distinct paths. Both Ethiopia and Kenya rely heavily on agriculture for economic stability, employment, and GDP contribution. In Kenya, agriculture employs over 40% of the total population and contributes 30% to the country's GDP (FAO, 2021; Heyer & King, 2015). Similarly, Ethiopia's agricultural sector is the backbone of its economy, employing a significant portion of the population and contributing to food security and income generation. While both countries share this reliance on agriculture, Kenya has made more rapid strides in integrating DFS into the sector.

Kenya stands out as a pioneer in mobile financial services, especially through the widespread success of M-Pesa, which revolutionized financial inclusion. M-Pesa's high penetration rate, with Safaricom controlling 63% of mobile subscriptions (FAO, 2021), has allowed smallholder farmers to use services like mobile payments, savings, and micro-loans. M-Shwari, an extension of M-Pesa, enables farmers to access credit and savings accounts, further enhancing financial inclusion for rural populations (Mapanje et al., 2023). Mobile financial services (MFS) are widely seen as a promising tool to improve the predicament of agricultural finance for smallholder farmers in Africa (Mapanje et al., 2023; Parlasca et al., 2022).

A key informant from the National Bank of Ethiopia (NBE) highlighted that comparing the development of digital financial services (DFS) in Ethiopia with Kenya's progress is challenging due to the different starting points of the two countries. "It is crucial to acknowledge that Ethiopia embarked on its DFS journey much later than Kenya. For a fair comparison, we must consider that Kenya's DFS landscape began to evolve significantly over a decade ago, with the launch of M-Pesa in 2007, whereas Ethiopia's DFS expansion is a more recent development, gaining momentum over the past five years. Thus, any comparative analysis must take into account these differing timelines and the subsequent stages of growth each country has experienced."

Ethiopia, on the other hand, is at an earlier stage of DFS adoption, though it has made significant progress. Key players such as Telebirr and CBE Birr are expanding their reach, particularly in rural areas. However, Ethiopia's DFS ecosystem is less developed compared to Kenya's, and the adoption of mobile financial services among smallholder farmers is still growing. The difference in DFS penetration between Ethiopia and Kenya can be attributed to Kenya's early start and strong private sector involvement, particularly Safaricom's leadership in digital innovation.

In Kenya, a large percentage of farmers have embraced mobile money services, with studies showing that 80% of farmers use mobile money for various financial transactions (Mapanje et al., 2023). However, only 15% of farmers use mobile services specifically for agriculture-related payments, and less than 1% access digital loans for farming inputs (FAO, 2021; Heyer & King, 2015; Mapanje et al., 2023). This indicates a high level of mobile money use but highlights untapped potential in DFS tailored to agricultural needs. Countries can learn from the Kenyan experiences and scale up/replicate the FinTech models that successfully financed smallholder agriculture in Kenya (Mapanje et al., 2023).

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In Ethiopia, the DFS landscape for farmers is still developing. While platforms like Telebirr are gaining traction, the overall adoption rates among smallholder farmers remain lower than in Kenya. Ethiopian farmers are beginning to benefit from digital payment systems, micro-loans, and savings tools, but these services are not yet as widely integrated into farming activities as they are in Kenya. However, as DFS infrastructure improves, Ethiopia has the potential to close the gap and replicate Kenya's success in leveraging DFS for agriculture.

Both countries face challenges related to the adoption of DFS among rural populations. In Kenya, despite the high use of mobile money, issues such as digital literacy and access to mobile phones in remote areas continue to impede the full potential of DFS for agriculture. Similarly, in Ethiopia, access to mobile networks, financial literacy, and digital literacy are significant barriers that hinder the widespread adoption of DFS. These challenges are especially pronounced in rural and underserved regions, where technological infrastructure is less developed. In Kenya, DFS has already made a noticeable impact on farmers' livelihoods. Smallholder farmers can receive payments for their produce, save money, and access micro-loans, enhancing their financial stability and enabling them to invest in agricultural inputs (Parlasca et al., 2022). This, in turn, has improved productivity and income generation in the agricultural sector.

In Ethiopia, the impact of DFS on farmers' livelihoods is emerging but has yet to reach the scale observed in Kenya. Ethiopian farmers are increasingly using DFS to access payments, savings, and credit, but the system is not as deeply integrated into daily agricultural practices. However, as Ethiopia continues to expand its digital infrastructure and DFS offerings, similar improvements in productivity and financial stability are anticipated.

The private sector plays a leading role in Kenya's DFS ecosystem. Safaricom's innovative approach, particularly through M-Pesa and M-Shwari, has been a driving force in digital financial inclusion. In contrast, Ethiopia's DFS landscape is more reliant on state-led initiatives, such as Telebirr, which is backed by the state-run telecom provider Ethio Telecom. While Ethiopia's private sector is beginning to engage with DFS, it has yet to match the scale and influence of Kenya's private sector in leading digital innovations.

Overall, while both Ethiopia and Kenya are using DFS to address financial inclusion in their agricultural sectors, Kenya has achieved broader adoption and integration of digital services among farmers. The success of Kenya's M-Pesa and M-Shwari highlights the potential of DFS to transform agricultural productivity and farmers' livelihoods. Ethiopia, while still in the early stages of DFS adoption, has strong potential to follow Kenya's model, particularly as its digital infrastructure improves and private sector involvement increases. Addressing challenges such as digital literacy and access to technology will be crucial for both countries to fully unlock the benefits of DFS for smallholder farmers.

## 06.15: Ethiopia Vs Ghana

Both Ethiopia and Ghana have made significant strides in leveraging digital financial services (DFS) to promote financial inclusion, particularly among smallholder farmers. However, the adoption and

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integration of DFS in the agricultural sectors of these two countries differ in terms of the types of services available, the level of private sector involvement, and the challenges faced in widespread adoption.

In both Ethiopia and Ghana, DFS platforms are seen as a critical tool in promoting financial inclusion among smallholder farmers. In Ghana, services such as Tigo Cash and e-Zwich have gained traction, providing farmers with access to secure, cashless payment systems and the ability to save money, pay for inputs, and receive payments for their crops. These services have reduced reliance on cash transactions and enabled farmers to manage their finances more efficiently (Atta-Ankomah et al., 2024; Peprah et al., 2020).

In contrast, Ethiopia's DFS landscape is still maturing, with services such as Telebirr and CBE Birr slowly expanding their reach among rural populations. While Ethiopian farmers are increasingly adopting mobile money services, the uptake of DFS for agriculture-specific transactions, such as payments for inputs or sales of produce, is less advanced compared to Ghana. Ghana's more diversified DFS ecosystem, including mobile money and biometric smart card-based systems like e-Zwich, offers broader functionality for farmers (Peprah et al., 2020).

Both countries have made progress in improving financial inclusion through DFS, though the levels of adoption and integration differ. In Ghana, the introduction of mobile money services and biometric payment systems has significantly increased access to formal financial services among unbanked populations, including farmers. Tigo Cash and e-Zwich, for instance, have provided smallholder farmers with secure ways to access savings, loans, and insurance, leading to improved financial management and investment in agricultural inputs (Peprah et al., 2020).

Ethiopia's DFS ecosystem is making similar strides, though it is still in the early stages of integrating financial services with agricultural activities. While mobile money platforms like Telebirr are expanding, the number of farmers using these services for agricultural purposes, such as saving for future investments or accessing loans, remains lower than in Ghana. However, as DFS platforms continue to grow in Ethiopia, the potential for similar improvements in financial inclusion is evident.

In Ghana, DFS has been widely adopted for a variety of agricultural transactions. Farmers use mobile money services to receive payments for crops, pay for agricultural inputs, and securely save money (Abdulai et al., 2023). These services reduce transaction costs and enhance the efficiency of financial management. For instance, by reducing the need for physical cash, farmers can better protect their earnings and reinvest in their farms, improving overall productivity and financial stability (Atta-Ankomah et al., 2024).

In Ethiopia, although DFS is being used for general financial transactions, its adoption for agriculture-specific payments and transactions is still developing. Farmers are beginning to adopt mobile money services to manage payments and access credit, but the integration of DFS with agricultural supply chains and marketplaces remains limited compared to Ghana. Ethiopia has the opportunity to expand the role of DFS in agriculture by building on its existing platforms to better serve farmers' unique financial needs.

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Both Ethiopia and Ghana face challenges in increasing the adoption of DFS among smallholder farmers, though the nature of these challenges varies. In Ghana, issues such as digital literacy, trust in digital services, and the rural network infrastructure have been identified as barriers to wider DFS adoption (Peprah et al., 2020). Although the availability of mobile money services is high, ensuring that farmers understand and trust these services remains a challenge.

Ethiopia faces similar challenges, particularly about digital literacy and network infrastructure in rural areas. Many Ethiopian farmers have limited access to reliable mobile networks, and there is a general lack of trust in digital financial services. Moreover, awareness of the benefits of DFS, especially for agriculture, is still growing. Addressing these challenges will be key to accelerating DFS adoption among smallholder farmers in both countries.

Overall, in both Ethiopia and Ghana, DFS has the potential to revolutionize financial inclusion for smallholder farmers, but the two countries are at different stages of adoption. Ghana has achieved wider integration of DFS in agricultural activities, with services like Tigo Cash and e-Zwich providing farmers with critical financial tools. Ethiopia, while still building its DFS infrastructure, has seen significant growth in mobile financial services and is poised to expand its impact on the agricultural sector. Both countries must address challenges such as digital literacy and rural network infrastructure to maximize the benefits of DFS for their agricultural sectors, with Ghana providing a potential model for Ethiopia to follow.

## 06.16: Ethiopia Vs India

India's experience with digital financial services (DFS) offers valuable insights for Ethiopia as it seeks to expand financial inclusion and empower smallholder farmers. The rapid growth of digital payment platforms such as Paytm, Google Pay, and PhonePe in India has created a robust DFS ecosystem that integrates millions of unbanked individuals into the formal financial system.

India's DFS landscape is highly developed, particularly in its integration with agriculture. The Aadhaar-enabled payment system (AEPS) linked to the unique biometric identity number has facilitated financial transactions for millions of people, including smallholder farmers, even in remote areas. The Kisan Credit Card (KCC) scheme provides farmers with timely access to credit for their agricultural needs, and government subsidies and direct benefit transfers are efficiently delivered through DFS platforms (Begum, 2018). India has made significant progress in increasing financial inclusion through DFS, particularly with the help of the Pradhan Mantri Jan Dhan Yojana (PMJDY), a government initiative aimed at providing banking services to unbanked populations. These accounts, linked to digital payment platforms, have brought millions into the formal financial system. The Aadhaar-linked payment system has enabled secure, biometric-based transactions without the need for traditional banking infrastructure (Begum, 2018).

India's DFS ecosystem is heavily linked to the delivery of government benefits and subsidies. The direct benefit transfer (DBT) system, enabled by Aadhaar and linked to digital payment platforms, ensures efficient, transparent, and secure transfers of subsidies, pensions, and other benefits directly into beneficiaries' accounts. Smallholder farmers benefit from these schemes, which include subsidies

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for agricultural inputs and direct payments for produce. The use of AEPS has also reduced the need for cash transactions, making financial management easier and more secure for rural populations.

Ethiopia's DFS ecosystem is still evolving in terms of facilitating government benefits and subsidies. While the use of digital platforms is growing, the direct integration of DFS for subsidy distribution and agricultural support programs is limited compared to India's advanced system. Learning from India's model, Ethiopia could enhance the role of DFS in delivering agricultural subsidies and government benefits, thus improving financial transparency and efficiency in rural areas.

In India, DFS has played a critical role in providing smallholder farmers with access to credit through services such as the Kisan Credit Card (KCC). The availability of timely and affordable credit allows farmers to invest in agricultural inputs, improve productivity, and manage risks associated with farming. In addition, DFS has empowered individuals and small businesses, driving economic growth and poverty reduction across the country (Begum, 2018).

Ethiopia is beginning to explore the potential of DFS in providing smallholder farmers with access to credit. While platforms like Telebirr are expanding financial services, there is still limited integration of DFS with agricultural credit schemes similar to India's KCC. Ethiopia can learn from India's approach by developing DFS platforms that cater specifically to the financial needs of farmers, providing them with timely access to credit and enabling greater economic empowerment.

Overall, India's experience with digital financial services offers valuable lessons for Ethiopia as it seeks to expand DFS adoption, particularly among smallholder farmers. India's robust DFS ecosystem, driven by platforms such as AEPS, Paytm, and the Kisan Credit Card scheme, has significantly enhanced financial inclusion, improved access to credit, and facilitated efficient government benefit transfers. Ethiopia, while making progress, can learn from India's approach by investing in infrastructure development, regulatory support, and financial literacy initiatives. With the right framework, Ethiopia can leverage DFS to empower its smallholder farmers, improve financial inclusion, and drive economic growth in rural areas.

## 06.17: Ethiopia Vs Bangladesh

Bangladesh has made notable strides in the digital financial services (DFS) sector, particularly through innovative approaches involving microfinance institutions (MFIs) and mobile financial services (Jamie Anderson, 2016).

In Bangladesh, the integration of mobile financial services has significantly transformed the financial landscape for smallholder farmers. Services like bKash provide farmers with essential financial tools, such as secure money transfers, savings accounts, and payments without the need to travel to distant banks. This has enhanced financial inclusion and economic resilience among rural populations, enabling farmers to manage their finances more efficiently and access financial services with greater ease (Jamie Anderson, 2016).

Bangladesh has demonstrated significant progress in financial inclusion through its DFS innovations (Prodhan et al., 2024). Microfinance institutions (MFIs) such as ASA, BRAC, and Grameen Bank have

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played a crucial role in providing financial services to underserved populations, including smallholder farmers. The success of mobile financial services like bKash further extends this reach, offering secure and convenient access to financial tools for those previously excluded from the formal financial system (Jamie Anderson, 2016).

In Bangladesh, mobile financial services such as bKash have been widely adopted by smallholder farmers for various agricultural transactions. Farmers use bKash to receive payments for their produce, save money securely, and conduct transactions conveniently without traveling to banks. This integration of DFS into daily agricultural activities helps reduce transaction costs and enhances financial management for farmers (Prodhan et al., 2024).

Ethiopia is gradually incorporating DFS into agricultural transactions, but the extent of this integration is still developing. While Ethiopian farmers are starting to use mobile money services for payments and savings, the broader use of DFS for agriculture-specific transactions is less advanced compared to Bangladesh. Ethiopia can benefit from expanding the role of DFS in agriculture by learning from Bangladesh's successful implementation of mobile financial services.

Bangladesh's success in integrating DFS with microfinance is notable. Institutions such as ASA, BRAC, Buro, and Grameen Bank have played a pivotal role in providing financial services to rural and impoverished populations. The combination of MFIs and mobile financial services has created a comprehensive financial ecosystem that supports smallholder farmers and other underserved groups (Jamie Anderson, 2016).

In Ethiopia, the role of MFIs in the DFS landscape is still developing. While there are some initiatives to integrate MFIs with digital financial services, the sector has not yet achieved the same level of integration and impact as in Bangladesh. Encouraging collaboration between MFIs and digital financial service providers could enhance Ethiopia's DFS ecosystem and improve access to financial services for smallholder farmers.

Overall, Bangladesh's experience with digital financial services provides valuable lessons for Ethiopia as it develops its DFS ecosystem. The success of mobile financial services like bKash and the role of microfinance institutions in Bangladesh highlights the potential for DFS to enhance financial inclusion, economic resilience, and access to financial tools for smallholder farmers (Prodhan et al., 2024). Ethiopia, while making progress in expanding DFS, can benefit from adopting strategies used in Bangladesh to overcome challenges and integrate DFS more effectively into agricultural and rural financial management. By addressing issues such as digital literacy, network connectivity, and regulatory frameworks, Ethiopia can build a robust DFS ecosystem that supports its smallholder farmers and the broader population.

## 06.18: Comparative Analysis: Summary

**Ethiopia:** DFS adoption is growing but remains low compared to other countries. The uptake is primarily driven by platforms like Telebirr and CBE Birr.

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**Kenya:** High adoption, with around 80% of farmers using mobile money. M-Pesa is the leading platform.

**Ghana:** Moderate adoption, with about 25% of the population using mobile money services like Tigo Cash and e-Zwich.

**India:** High adoption, driven by platforms such as Paytm, Google Pay, and PhonePe. Around 40% of the population uses DFS.

**Bangladesh:** High adoption, with significant usage of mobile financial services like bKash

Table 21: Service diversity

| Country    | Types of DFS Services                     | Notable Platforms          |
|------------|-------------------------------------------|----------------------------|
| Ethiopia   | Mobile Money, Payments, Savings           | Telebirr, CBE Birr         |
| Kenya      | Mobile Money, Savings, Loans, Insurance   | M-Pesa, M-Shwari           |
| Ghana      | Mobile Money, Payments, Savings, Loans    | Tigo Cash, e-Zwich         |
| India      | Payments, Savings, Investments, Insurance | Paytm, Google Pay, PhonePe |
| Bangladesh | Mobile Money, Payments, Savings           | bKash, Rocket              |

Source: (Abdulai et al., 2023; Anderson et al., 2016; Peprah et al., 2020)

Ethiopia DFS services are still expanding. The focus is on mobile money and payments, with a growing range of offerings. Whereas, Kenya, has an extensive range of services including mobile money, savings, loans, and insurance. Ghana provides mobile money, payments, savings, and loans, with ongoing development of digital services. On the other hand, India a wide range of DFS services including payments, savings, loans, investments, and insurance. Bangladesh focuses on mobile money and payments, with services like bKash enhancing financial inclusion.

All in all, the comparative analysis highlights the varying stages of DFS growth and the different impacts across Ethiopia, Kenya, Ghana, India, and Bangladesh. Kenya and India exhibit high adoption rates and diverse service offerings with significant impacts on financial inclusion. Bangladesh also shows substantial progress, especially with mobile financial services like bKash. Ghana and Ethiopia are making strides but face challenges in service diversity and infrastructure development. By addressing these challenges and leveraging successful strategies from other countries, Ethiopia can enhance its DFS ecosystem and further promote financial inclusion for its population.

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## 06.19: Challenges and Barriers

The implementation and expansion of Digital Financial Service in emerging markets often encounter various challenges and barriers that can significantly impact their effectiveness and reach. Challenges in DFS deployment can stem from multiple sources, including technological limitations, infrastructural constraints, regulatory hurdles, and socio-economic factors. Issues such as limited internet connectivity, low digital literacy, and resistance to change can hinder the adoption and effective use of DFS (Abdulai et al., 2023). Additionally, regulatory environments and the availability of appropriate digital financial products play a pivotal role in shaping the success of these services. Advancing digital payments requires the combined efforts of stakeholders across many sectors and segments of the economy (NBE, 2020).

A senior expert from the Commercial Bank of Ethiopia emphasized that the lack of smartphones among many smallholder farmers does not impede their access to digital financial services. "Smartphones are not a prerequisite for financial digitization in our approach," the expert noted. "CBE supports the use of USSD (Unstructured Supplementary Service Data) codes, which allow farmers to access financial services using basic feature phones. This technology enables transactions and account management without the need for a smartphone. Furthermore, we have implemented a network of agents to extend our reach to remote farmers, ensuring that even those in the most isolated areas can benefit from our services."

Similarly, a senior expert from the National Bank of Ethiopia (NBE) highlighted the role of USSD in addressing network connectivity issues for users without smartphones. "USSD technology effectively mitigates the problem of limited network access for non-smartphone users," the expert explained. "By utilizing USSD codes, we provide a viable solution that allows farmers to engage with digital financial services despite the challenges of network infrastructure and the absence of advanced mobile devices."

A CBE ATM manager pointed out the challenges in encouraging local farmers to embrace digital financial services. "Despite our extensive efforts to educate farmers about the benefits of DFS, there is significant resistance to change," the manager explained. "The adoption rates have not reached our expectations, and transforming attitudes toward digital financial tools remains a considerable challenge. There is still much work to be done to shift mindsets and foster a more receptive attitude toward these services."

In addition, the CBE Management Information Systems (MIS) manager stressed the importance of banks fulfilling their corporate social responsibilities to effectively reach remote farmers. "To ensure inclusive financial provision, banks must address the needs of underserved communities, particularly in rural areas," the MIS manager stated. "Farmers often face challenges such as lack of collateral, which can hinder their access to financial services. Banks need to rethink their approach, moving beyond the traditional focus on urban centers and construction sectors. Agriculture should not be dismissed as a high-risk business, as this stereotype is both inaccurate and detrimental to broadening financial inclusion."

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An Etho Telebirr expert mentioned that people generally use digital financing only when pushed which explains the significant improvement in Telebirr petrol payments. Consequently, the overall digital financial services ecosystem has been improving, with current collaborations involving 28 banks. Over the past three years, the ecosystem has improved by 200%.

Telebirr experts contend that internet connectivity is not a significant barrier to the use of their services. "In regions like Amhara, where internet connectivity has been limited for the past year, Telebirr users have continued to access financial services via USSD codes," they explained. "This demonstrates that our service model effectively accommodates areas with poor internet infrastructure."

Furthermore, Telebirr experts address concerns about financial literacy by highlighting their Interactive Voice Response (IVR) system. "Financial literacy is not a significant issue with our system," they noted. "Our IVR 127 voice services require users to understand only numbers 1 through 10, which simplifies the process. Additionally, our system supports five languages, ensuring that language barriers do not impede access to financial services."

In addition, the National Bank of Ethiopia (NBE) clarified its role in the financial sector. "As the NBE, we are not regulators but collaborators," they stated. "Our primary function is to facilitate processes for banks and amend laws or proclamations based on recommendations from our stakeholders, primarily banks."

Telebirr's Mr. Burk also raised a crucial issue regarding digital lending. "Currently, there is no specific regulation for digital loans, which presents a challenge," he argued. "Addressing this gap is essential so that we can offer loans in compliance with appropriate regulations and further expand our financial services."

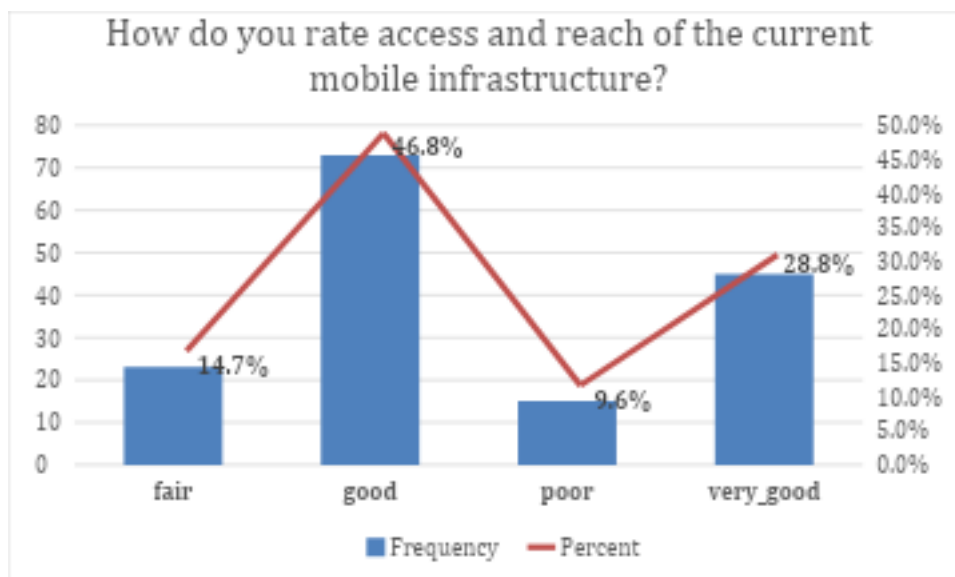


Figure 10: Access and reach of the current mobile infrastructure

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The assessment of mobile infrastructure access and reach in the area reveals a varied perception among respondents. Hence, the majority of respondents, 46.8% (n=73), rate the access and reach of current mobile infrastructure as good. This indicates that nearly half of the respondents feel that mobile infrastructure adequately supports their needs for connectivity and digital services.

A significant portion of respondents, 28.8% (n=45), consider the mobile infrastructure to be very good. This suggests that a substantial number of users experience high levels of satisfaction with the quality and reach of mobile services, which likely enhances their ability to utilize digital financial services and other mobile-based applications effectively. 14.7% of respondents (n=23) rate the mobile infrastructure as fair. This indicates a moderate level of satisfaction, suggesting that while mobile services are generally functional, there may be some areas for improvement in terms of coverage, speed, or reliability. Whereas, a smaller percentage, 9.6% (n=15), rate the mobile infrastructure as poor. This group likely faces significant challenges related to connectivity, which could impact their ability to use digital services effectively.

Overall, the varying levels of satisfaction, particularly the presence of respondents rating the infrastructure as poor or fair, highlight the need for continued investment and improvement in mobile infrastructure. Enhancing connectivity and service quality can help ensure that all users have reliable access to digital financial services and other mobile-based tools. For the 9.6% who rate mobile infrastructure as poor, targeted efforts are needed to address connectivity issues. This could involve expanding network coverage, improving signal strength, and providing support in areas with limited access. The positive ratings of good and very good suggest that mobile infrastructure is generally strong in many areas. Providers and stakeholders should build on this foundation to further develop digital services and leverage existing strengths to enhance user experience and adoption. In general, strong mobile infrastructure supports the effective delivery of digital financial services. Hence, ensuring high-quality mobile connectivity will be crucial for the successful adoption and use of these services, particularly in remote or underserved areas. In summary, while a significant portion of respondents view the mobile infrastructure positively, there is a clear need to address areas with lower ratings to ensure equitable access and support the growth of digital financial services in the study area.

Table 22: If DFS adopted, have you ever faced the following issues?

| Items                       | Frequency | Percent |
|-----------------------------|-----------|---------|
| Scams                       | 15        | 9.6     |
| Password missing            | 29        | 18.5    |
| Transaction failure         | 39        | 25      |
| Personal information stolen | 17        | 10.8    |
| Hidden charges              | 23        | 14.7    |

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|       |    |      |
|-------|----|------|
| Other | 18 | 11.5 |
| None  | 15 | 9.6  |

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The issues faced by users with Digital Financial Services (DFS) reveal several key challenges and areas for improvement. The most common issue reported is transaction failure, with 25% of respondents (n=39) experiencing this problem. This indicates that technical issues or system errors are a significant concern for users, affecting the reliability and efficiency of DFS transactions. A notable 18.5% of respondents (n=29) have encountered issues with missing passwords. This suggests that password management and security are areas where users frequently face difficulties, potentially leading to access problems and frustration. Study by Prodhan et al., (2024) in Bangladesh, pointed out that farmers show higher satisfaction with cash transactions over DFS. Challenges include difficulty in using DFS, lack of knowledge on PIN changes (70.5%), and terms and conditions (72%). Scams are a significant issue, affecting 42.86% of farmers.

Hidden charges are an issue for 14.7% of respondents (n=23). This problem highlights concerns about transparency in fee structures and the potential for unexpected costs associated with DFS usage. 10.8% of respondents (n=17) have experienced personal information theft. This underscores the importance of robust security measures to protect users' sensitive information and prevent identity theft. Whereas, 9.6% of respondents (n=15) report falling victim to scams. This indicates that fraudulent activities are a concern and that users need to be cautious and informed about potential risks in the digital financial environment. 11.5% of respondents (n=18) have faced other issues not specified in the survey, suggesting that there may be a variety of additional challenges that users encounter with DFS. On the other hand, 9.6% of respondents (n=15) report having encountered no issues with DFS. This group indicates that, despite common challenges, some users have had smooth and trouble-free experiences with digital financial services.

The issues related to scams, personal information theft, and password management highlight the need for enhanced security measures. DFS providers should invest in robust encryption, two-factor authentication, and user education to protect against fraud and ensure secure access. The high incidence of transaction failures points to a need for improved technical reliability and support. Providers should focus on minimizing system errors, offering reliable customer support, and ensuring that transactions are processed smoothly. Addressing hidden charges is crucial for building trust with users. DFS providers should ensure that fee structures are communicated and transparent, avoiding any unexpected costs that might undermine user confidence. Educating users about common issues, such as password management and identifying scams, can help mitigate some of the challenges faced. Providing resources and support for users to handle and prevent these issues can improve their overall experience with DFS. Overall, addressing these issues and focusing on user needs will be crucial for enhancing the adoption and effectiveness of DFS, ensuring that users have a secure, reliable, and transparent experience.

Table 23: What are the main challenges you face in accessing digital financial services?

| Items                               | Frequency | Percent |
|-------------------------------------|-----------|---------|
| Lack of mobile phone                | 24        | 15.3    |
| Poor internet connectivity          | 49        | 31.4    |
| Lack of knowledge on how to use DFS | 41        | 26.2    |
| High transaction fees               | 8         | 5.1     |
| Trust issues with digital platforms | 14        | 8.9     |
| Other                               | 20        | 12.8    |

The main challenges faced by users in accessing Digital Financial Services (DFS) are diverse and highlight several critical areas that need to be addressed. The most significant challenge reported is poor internet connectivity, affecting 31.4% of respondents (n=49). This suggests that inadequate or unreliable internet access is a major barrier to effectively using DFS. Enhancing internet infrastructure and expanding connectivity in underserved areas could help alleviate this issue. A substantial 26.2% of respondents (n=41) struggle with a lack of knowledge on how to use DFS. This indicates a need for improved user education and training to help individuals understand how to navigate and utilize digital financial platforms effectively (Ljumović et al., 2021).

Lack of mobile phones is a challenge for 15.3% of respondents (n=24). This highlights that access to mobile devices is a prerequisite for using DFS, and efforts to increase mobile phone penetration could help address this barrier. 12.8% of respondents (n=20) face other unspecified challenges, suggesting that there may be additional, diverse issues impacting DFS access that are not fully captured in the provided categories. Trust issues with digital platforms affect 8.9% of respondents (n=14). Building trust through robust security measures, transparent practices, and reliable customer support is essential for increasing user confidence in DFS. The least reported challenge is high transaction fees, mentioned by 5.1% of respondents (n=8). While this is less common, it still indicates that transaction costs can be a concern for some users and may affect their willingness to adopt DFS.

Addressing poor internet connectivity is crucial for ensuring that users can access DFS reliably. Investments in Internet infrastructure, particularly in rural or underserved areas, can significantly enhance the accessibility and usability of digital financial services. Providing comprehensive training and resources on how to use DFS can help overcome the knowledge barrier. Educational programs, workshops, and user-friendly guides can empower individuals to effectively use digital financial tools. To address the lack of mobile phones, initiatives to increase mobile device availability and affordability could be beneficial. Partnerships with mobile providers and subsidies for low-income users could help bridge this gap. Strengthening security measures and fostering transparency can help address trust issues. Clear communication about data protection, fraud prevention, and customer support can build user confidence in digital platforms. Investigating the unspecified "other" challenges can provide insights into additional barriers users face. Tailoring solutions to address these specific issues can improve overall access and user experience. Although high transaction fees are less common, they

still impact some users. Providers should consider ways to reduce fees or offer more competitive pricing structures to attract and retain users.

Overall, addressing these challenges through targeted interventions can improve access to and adoption of DFS, making digital financial services more inclusive and effective for a broader audience.

## 06.20: Access to DFS for Smallholder Farmers in Ethiopia: Is It a Hard Nut to Crack?

Access to DFS for smallholder farmers in Ethiopia presents a complex and multifaceted challenge, often called a "hard nut to crack." (IFC, 2018). While DFS holds significant potential for enhancing financial inclusion, increasing productivity, and improving market access for smallholders, various structural, infrastructural, and behavioral barriers continue to hinder widespread adoption (Anne Marie van Swinderen, 2017b; Gashaw Abate & Getnet Kindie, 2016). This issue remains a critical area of debate, with both optimistic and skeptical perspectives on its feasibility and long-term impact.

Proponents of DFS argue that, with the right interventions, the barriers can be overcome, unlocking a transformative impact on the agricultural sector. DFS provides a powerful tool for extending financial services to previously unbanked populations. For smallholder farmers, who often operate in remote areas far from formal financial institutions, DFS offers a convenient and secure way to access banking services through mobile phones. This has the potential to bridge the gap between informal and formal financial systems, allowing farmers to save, borrow, and invest more effectively (Howard Miller, 2019b; IFC, 2018). By facilitating digital payments and enabling access to digital marketplaces, DFS can help smallholder farmers reach broader markets, connecting them directly with buyers and reducing reliance on middlemen. This could lead to better prices, improved profitability, and greater resilience to market fluctuations.

DFS platforms can offer tailored financial products such as microloans, insurance, and savings mechanisms that cater to the specific needs of smallholder farmers (IFC, 2018). These products can help farmers mitigate risks associated with seasonal income fluctuations and crop failures, thus stabilizing their livelihoods. There is growing interest from the Ethiopian government, as well as international development partners, to promote the adoption of DFS as a tool for rural development (NBE, 2020a, 2020b). This includes investments in infrastructure, digital literacy programs, and favorable regulatory frameworks, which could help create an enabling environment for DFS adoption among smallholder farmers.

On the other hand, skeptics argue that implementing DFS for smallholder farmers in Ethiopia is far more challenging than optimistic projections suggest. Several barriers make DFS access for farmers a difficult task. One of the most significant barriers to DFS adoption in rural Ethiopia is the lack of adequate digital and financial infrastructure (NBE, 2020a). Many rural areas still suffer from poor mobile network coverage and unreliable electricity, which hampers the use of mobile phones and digital platforms. Without addressing these infrastructural gaps, it is difficult to scale DFS solutions in rural communities. The majority of smallholder farmers in Ethiopia have limited digital literacy, which poses a significant challenge to DFS adoption. Many farmers are unfamiliar with mobile banking

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technologies and may struggle to navigate digital platforms without proper training. This digital divide raises concerns about the practicality of DFS solutions for rural populations.

A deep-seated cultural preference for cash transactions further complicates the adoption of DFS among smallholder farmers. Cash is perceived as tangible, secure, and familiar, making it difficult to shift behavior toward digital payments. As a result, even when DFS platforms are available, uptake may be slow due to cultural resistance. For many smallholder farmers, access to mobile phones, data plans, and the cost of DFS transactions may be prohibitive. Given that many farmers operate on thin profit margins, the affordability of using DFS platforms becomes a critical factor that could limit adoption. Additionally, high transaction fees or unreliable services could discourage regular usage of DFS. Another challenge is the limited integration of DFS with broader financial ecosystems. In many cases, smallholder farmers may not have access to the full range of services such as credit, insurance, and savings through DFS platforms. Digital credit does not always lead to greater investment in agriculture but has been documented to smooth consumption, a measure of resilience. Index insurance products have been documented to increase farmers' expenditure on yield-increasing inputs (IFC, 2018). The lack of a comprehensive ecosystem limits the perceived value of DFS for farmers, who may see little incentive to adopt these services if they don't provide holistic financial solutions.

Access to DFS for smallholder farmers in Ethiopia is indeed a complex issue, one that requires a nuanced approach. While there are compelling arguments in favor of DFS as a transformative tool for financial inclusion and value chain development, significant barriers remain that could prevent its widespread adoption. Addressing these challenges will require concerted efforts from governments, financial institutions, development partners, and the private sector. Whether DFS can truly be unlocked for smallholder farmers depends on the ability to tackle infrastructural, cultural, and economic obstacles sustainably and inclusively. The debate surrounding DFS access for smallholder farmers in Ethiopia hinges on whether the benefits of digital financial inclusion can be realized in the face of these significant barriers. Key questions remain open for academic and policy-driven debate.

## 06.21: Practical Recommendations

Unlike cash payments or bank and check deposits, which require users to travel to a specific bank branch or utility provider during their designated working hours, digital payments give users the ability to make payments remotely at their convenience, saving time and improving the payment experience (NBE, 2020).

Table 24: Respondents' perception on training on DFS

| Items | Frequency | Percent |
|-------|-----------|---------|
|-------|-----------|---------|

| Have you taken training on DFS so far?                                                  |     |      |
|-----------------------------------------------------------------------------------------|-----|------|
| Yes                                                                                     | 34  | 21.8 |
| No                                                                                      | 121 | 77.6 |
| Would you be interested in receiving training on how to use digital financial services? |     |      |
| Yes                                                                                     | 113 | 72.4 |
| No                                                                                      | 43  | 27.6 |

The data on training related to Digital Financial Services (DFS) reveals significant insights into the current state of user education and interest in further training. Only 21.8% of respondents (n=34) have received training on DFS so far. This indicates that a majority of users have not yet had the opportunity to learn about digital financial services in a formal setting. A substantial 72.4% of respondents (n=113) express interest in receiving training on how to use DFS. This strong interest suggests a high demand for educational resources and support to help users better understand and utilize digital financial services. 27.6% of respondents (n=43) are not interested in receiving training on DFS. This minority might have existing knowledge or feel that additional training is unnecessary at this time.

The high interest in receiving training highlights the need for targeted educational programs on DFS. Developing and implementing training sessions can help users understand how to use digital financial tools and overcome existing challenges effectively. To address the current low participation in DFS training, efforts should be made to make educational resources more accessible. This could involve offering online courses, community workshops, or partnerships with local organizations to provide training in various formats (IFC, 2018). Understanding the specific needs and challenges faced by users can help tailor training programs to address these issues effectively. Customized training that covers practical aspects of DFS usage, security, and troubleshooting can be particularly beneficial.

Increasing awareness about available training opportunities can encourage more users to participate. Informational campaigns and outreach efforts can help highlight the benefits of training and how it can improve the use of DFS. It is important to assess the effectiveness of training programs and gather feedback from participants. This can help identify areas for improvement and ensure that training meets users' needs.

Overall, the strong interest in DFS training suggests that providing educational resources and support can significantly enhance user engagement and effectiveness with digital financial services. Addressing the current gap in training and promoting future learning opportunities can help overcome barriers to DFS adoption and usage. Respondent's perception of Training, support general recommendation, and Future Intentions are presented and discussed below:

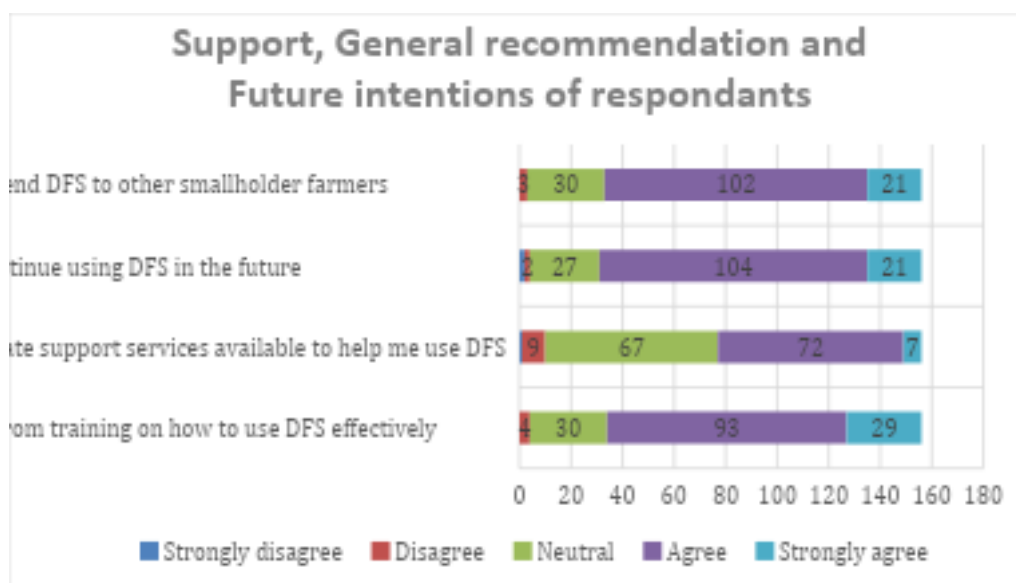


Figure 11: General recommendation and future intentions of respondents

The above table summarizes the respondents' views on the need for training, support services, future usage intentions, and recommendations concerning Digital Financial Services (DFS). Each item is measured using a Likert scale, with the mean scores indicating overall perceptions. Hence, the majority of respondents strongly agree that they would benefit from training on how to use DFS, with a mean score of 3.94. This suggests that while many farmers are already using DFS, there is a clear demand for additional training to improve their digital financial literacy. Offering targeted training programs on DFS can enhance the farmers' ability to leverage these services for better financial management, market access, and risk mitigation. Future interventions should focus on building capacity to ensure optimal usage.

Respondents' perception of the availability of support services to help them use DFS is moderate, with a mean score of 3.48. While some farmers find the existing support services adequate, there is room for improvement in providing more accessible and responsive assistance for DFS users. Strengthening customer support and providing more local agents or help centers could improve the farmers' experience with DFS. Ensuring timely resolution of issues like transaction failures, security concerns, and technical difficulties would encourage sustained use of DFS. On the other hand, farmers expressed a strong likelihood of continuing to use DFS in the future, with a mean score of 3.90. This demonstrates that most respondents are satisfied with the services and see DFS as an integral part of their financial and farming activities. Given the high likelihood of future DFS use, service providers should focus on enhancing service quality, expanding features, and ensuring that DFS platforms remain relevant to the evolving needs of farmers.

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A large proportion of respondents are willing to recommend DFS to other smallholder farmers, with a mean score of 3.90. This reflects a positive perception of DFS, as farmers recognize the benefits it brings to their financial activities and are confident in its potential to help others. The willingness to recommend DFS is a strong indicator of customer satisfaction. Service providers can leverage this by promoting peer-to-peer education and farmer-driven advocacy for DFS adoption in rural areas.

The overall perception of DFS among farmers is highly positive, particularly in terms of the need for training, continued usage, and recommendations. However, there is a clear demand for more support services to help farmers overcome technical challenges. By addressing these areas and providing more comprehensive training, DFS adoption and usage can be further optimized, leading to increased financial inclusion and improved livelihoods for smallholder farmers.

To address the identified challenges and barriers, offer practical recommendations for stakeholders, including government agencies, financial institutions, technology providers, and NGOs. Based on the key informant feedback the following practical recommendations are suggested:

*Table 25: Practical recommendations*

| Overarching intervention          | Specific intervention          | Implement through                                                                                                                                                                                 |
|-----------------------------------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Enhance Infrastructure:           | Improve Internet Connectivity: | Expand and enhance internet and mobile network coverage, especially in rural areas. This can be achieved through public-private partnerships and investments in telecommunications infrastructure |
|                                   | Reliable Power Supply:         | Explore renewable energy solutions in remote areas                                                                                                                                                |
| Financial Literacy and Education: | Educational Campaigns:         | Launch widespread financial literacy campaigns to educate the population on the benefits and usage of DFS. Use multiple languages and local dialects to reach a broader audience.                 |
|                                   | Training Programs:             | Conduct training programs for local communities, focusing on digital literacy and basic financial concepts.                                                                                       |
| Regulatory Framework:             | Supportive Policies:           | Develop and implement policies that encourage the adoption of DFS, such as tax incentives for                                                                                                     |

| Overarching intervention        |  | Specific intervention             | Implement through                                                                                                                                         |
|---------------------------------|--|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                 |  |                                   | digital transactions and reduced regulatory barriers for fintech companies.                                                                               |
|                                 |  | Consumer Protection:              | Establish and enforce strong consumer protection laws to build trust in DFS.                                                                              |
| Collaboration and Partnerships: |  | Public-Private Partnerships:      | Foster collaboration between the government, financial institutions, and telecom companies to create a robust DFS ecosystem.                              |
|                                 |  | Community Engagement:             | Partner with local communities and organizations to understand their needs and tailor DFS solutions accordingly.                                          |
| Innovative Solutions:           |  | USSD and IVR Services:            | Continue to promote and expand the use of USSD and IVR services to ensure accessibility for those without smartphones or internet access.                 |
|                                 |  | Mobile Money Agents:              | Increase the number of mobile money agents in rural and remote areas to facilitate transactions and provide support.                                      |
| Addressing Collateral Issues:   |  | Alternative Credit Scoring:       | Develop alternative credit scoring models that use data such as transaction history, mobile usage, and social behavior to assess creditworthiness.        |
|                                 |  | Microfinance and Loan Guarantees: | Encourage microfinance institutions to offer small loans without traditional collateral. Implement loan guarantee schemes to reduce the risk for lenders. |
| Promote Agriculture Finance:    |  | Agricultural Insurance:           | Introduce and promote agricultural insurance products to mitigate the risks associated with farming.                                                      |
|                                 |  | Tailored Financial Products:      | Develop financial products specifically designed for farmers, such as seasonal loans and savings accounts that align with agricultural cycles.            |
| Improve User Experience:        |  | User-Friendly Interfaces:         | Design DFS platforms with simple, intuitive interfaces that cater to users with varying levels of digital literacy.                                       |
|                                 |  | Multilingual Support:             | Ensure DFS platforms support multiple languages spoken across Ethiopia.                                                                                   |

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| Overarching intervention   | Specific intervention         | Implement through                                                                                           |
|----------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------|
| Monitoring and Evaluation: | Data Collection and Analysis: | Regularly collect and analyze data on DFS usage and challenges to make informed decisions and improvements. |
|                            | Feedback Mechanisms:          | Implement feedback mechanisms to gather user input and address concerns promptly.                           |

## 07: Conclusion and Recommendations

This section draws conclusions based on the research findings and provides practical recommendations aimed at improving access to and usage of DFS. By implementing targeted interventions that address the identified challenges, stakeholders, including policymakers, financial institutions, and development organizations, can significantly enhance the effectiveness of DFS in supporting the financial and agricultural activities of smallholder farmers.

### 07.01: Conclusion

This study underscores the significant potential of Digital Financial Services (DFS) to enhance financial inclusion, productivity, and livelihood outcomes among smallholder farmers. The findings reveal that while mobile phone ownership is widespread, with 85.9% of respondents owning a device, significant barriers remain to the full adoption and usage of DFS. These barriers include limited access to smartphones and internet connectivity, low levels of digital and financial literacy, and mistrust in digital platforms.

The research highlights the critical role of targeted interventions to address these challenges. Improving digital and financial literacy, expanding mobile network coverage, and fostering greater trust in DFS are essential steps to enhance the accessibility and effectiveness of these services. Moreover, the strong interest in DFS training among respondents indicates a pressing need for capacity-building initiatives, which could significantly improve user engagement and the impact of DFS on rural economies.

the comparative analysis of Digital Financial Services (DFS) across Ethiopia, Kenya, Ghana, India, and Bangladesh reveals a dynamic and evolving landscape, shaped by diverse challenges and varying degrees of success. While Kenya and India have demonstrated remarkable advancements in DFS adoption and service diversity, other countries like Ethiopia and Ghana are making significant strides but still face notable barriers.

Kenya's DFS ecosystem, with its high adoption rates and comprehensive service offerings, exemplifies the transformative potential of mobile financial technologies in driving financial inclusion. Similarly, India's extensive range of DFS solutions and government-backed initiatives illustrate the impact of robust digital infrastructure and regulatory support in enhancing financial access and economic empowerment.

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In contrast, Ethiopia and Ghana are in earlier stages of DFS development, grappling with challenges such as low digital literacy, limited internet connectivity, and infrastructural constraints. These obstacles underscore the need for tailored strategies to address regional specificities and support the gradual integration of DFS into the financial habits of underserved populations. Bangladesh's success in integrating mobile money with microfinance highlights the importance of innovative approaches in reaching rural and impoverished communities. However, challenges such as regulatory hurdles and interoperability issues persist, affecting the overall efficacy of DFS. Across all countries, common barriers such as resistance to change, inadequate infrastructure, and regulatory gaps hinder the full realization of DFS potential. Addressing these challenges requires a concerted effort from governments, financial institutions, and technology providers to foster an environment conducive to the growth of DFS.

To advance financial inclusion and support economic development, it is essential to enhance digital literacy, improve infrastructure, and develop supportive regulatory frameworks. By learning from successful models and addressing existing barriers, Ethiopia and other emerging markets can build robust DFS ecosystems that cater to the needs of diverse populations and drive sustainable economic growth.

Overall, the study demonstrates that while DFS has already contributed positively to financial inclusion and agricultural productivity, further efforts are needed to unlock its full potential. Addressing infrastructural, educational, and trust-related challenges through targeted interventions will be essential for ensuring that DFS becomes a powerful tool in supporting sustainable rural development and improving the well-being of smallholder farmers.

## 07.02: Policy implications

The policy implications and recommendations presented in this study are designed to enhance the adoption and effective use of DFS among smallholder farmers. By addressing gaps in training, infrastructure, and trust, stakeholders can facilitate greater financial inclusion, ultimately improving the livelihoods and productivity of farmers in rural areas.

The findings of this study provide critical insights into the current state of digital financial services (DFS) adoption and highlight the need for concerted efforts by policymakers, financial institutions, and development organizations to address existing challenges. The low participation in DFS training (21.8%) coupled with the high interest in receiving training (72.4%) underscores the pressing need for targeted policy interventions aimed at improving digital literacy and facilitating access to DFS. The following policy implications and recommendations can guide future efforts to enhance DFS adoption and usage among smallholder farmers:

**Develop and Expand Targeted Training Programs:** The strong demand for DFS training presents an opportunity for financial institutions, government agencies, and development partners to create tailored educational programs aimed at enhancing digital and financial literacy. Training should focus on practical DFS use, security, troubleshooting, and addressing users' specific needs. Policy frameworks should support the inclusion of DFS training in agricultural extension programs and

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community development initiatives. Mobile money can help enhance smallholder economic outcomes that are relevant for rural development and poverty reduction. Policy options should therefore consider expanding m-money services to smallholder farmers especially those in rural areas. This can be done by intensifying m-money advertisement and education (Peprah et al., 2020).

**Enhance Access to Training Resources:** One of the barriers to widespread DFS adoption is the lack of accessible training opportunities. Policy initiatives should focus on increasing the availability of DFS training through multiple channels, including community workshops, mobile-based learning platforms, and partnerships with local organizations. This approach would make training accessible to a broader audience, particularly in remote areas with limited access to traditional educational resources.

**Improve Mobile and Digital Infrastructure:** The lack of reliable internet connectivity and poor mobile network coverage were identified as significant challenges to DFS usage. Policymakers should prioritize investments in mobile and digital infrastructure to ensure that rural and underserved regions have the connectivity necessary for effective DFS usage. Expanding network coverage and improving internet access will enable farmers to fully utilize DFS for their financial and farming needs.

**Promote Trust and Security in DFS:** The perception of digital financial services as insecure or untrustworthy is a key barrier to adoption. Efforts should be made to build trust through consumer protection measures, transparency in fees and transactions, and safeguarding personal information. Regulatory frameworks that emphasize the protection of digital users' rights and address fraud and cyber threats will be critical in fostering confidence in DFS platforms.

**Tailored Financial Products and Services:** Financial institutions need to design DFS products and services that cater to the specific needs of smallholder farmers (Prodhan et al., 2024). This includes offering microloans, savings products, and insurance schemes that are accessible through digital platforms. By aligning DFS offerings with the financial and operational realities of smallholder farming, financial institutions can play a pivotal role in promoting financial inclusion and agricultural productivity. Gaining insight into what farmers truly prioritize is crucial for creating DFS products that achieve high adoption rates and commercial success (IFC, 2018). Digital solutions to support small-scale farmers should be aligned to local conditions and centered around the needs of small-scale farmers (Smidt & Jokonya, 2022).

**Strengthen Support Services:** The moderate perception of existing support services (mean score of 3.48) suggests room for improvement. Financial institutions and DFS providers should invest in expanding their support services, including local agents and help centers, to assist users with technical issues and transaction-related challenges. Providing more responsive and accessible customer support will encourage greater confidence and sustained use of DFS.

**Leverage Peer-to-Peer Education and Advocacy:** The willingness of farmers to recommend DFS to their peers (mean score of 3.90) can be leveraged to promote DFS adoption through peer-to-peer learning and farmer-driven advocacy. Encouraging farmers who are already using DFS to educate others about its benefits can create a network effect, accelerating adoption and fostering trust within rural communities.

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**Monitor and Evaluate Training and DFS Usage:** Regular monitoring and evaluation of DFS training programs and user experiences should be a priority for financial institutions and government agencies. By collecting feedback and assessing the impact of training interventions, stakeholders can continually refine their strategies to ensure they are meeting users' evolving needs and addressing any barriers to adoption.

**Public-Private Partnerships for DFS Promotion:** Collaboration between the public and private sectors is crucial for scaling DFS solutions in rural areas. Government agencies, NGOs, and technology providers should partner to develop initiatives that promote financial inclusion through DFS. These partnerships can support infrastructure development, financial literacy campaigns, and innovative DFS solutions tailored to the agricultural sector (IFC, 2018).

All in all, Ethiopia's DFS ecosystem development differs in some aspects from other countries in the region, and Ethiopia is therefore expected to follow its path to set up and grow digital financial services (Anne Marie van Swinderen, 2017). Digital finance and financial innovations should be used to achieve financial inclusion in a way that minimizes tail risk to poor and vulnerable customers (Ozili, 2020).

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## 09: Annexes

### a. Interview Guide – Financial Institutions (Banks, MFI, NBE)

#### Procedure

The firm will appreciate your participation in this study. If you choose to participate, I will ask you questions about your personal experiences and opinions on Business Opportunities in Developing Digital Financial Services (DFS) for Small Holder Farmers (SHF). This study involves audio recording and note-taking of your interview with the researcher. Neither your name nor any other identifying information will be associated with the audio recording or the transcript. Only the research team will be able to listen to the recordings. The research team will transcribe the recordings and erase them once the transcriptions are checked for accuracy. The interview will take us about 30 minutes to complete.

#### Voluntary Participation

Your participation is entirely voluntary, and you are free to take part or withdraw at any time without any consequences. You may choose to answer some or all of the questions posed.

#### Confidentiality

Any information you provide will be kept private, and your identity will be kept confidential. None of the information you provide will be used in connection with your name or other identifying information.

#### Potential Risks

This conversation will not be shared with your employer, colleagues, or anyone outside the small research team. Additionally, the study will not be used to provide individual-level feedback on specific employees or target institutions.

#### General Information

Can you please introduce yourself, your name, organization, position?

#### General points to raise:

- ✓ Current state of DFSs adoption in the country
  - o Type of DFS provided in the country (*mobile money (digital wallet), mobile banking, agent banking, digital payment system (payment gateways for e-commerce and peer-to-peer payment services), etc*).
  - o Number of DFS providers by name (like Telebirr, M-Pesa, Mobile banking service providers, specialized agents who deliver financial services to remote and underserved communities etc), region, urban/rural, specialization, year of establishment, amount of capital, volume and frequency of transaction, market target/orientation, etc

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- ✓ Current state related to DFS to small holders farmers ( type, no, etc ; strategies placed to improve DFS access to smallholder farmers)
- ✓ Policy and regulatory provisions related to DFS
- ✓ Policies and initiatives to promote financial inclusion in the agricultural sector
- ✓ Role the NBE playing in creating an enabling regulatory environment for DFS to smallholder farmers in Ethiopia
- ✓ If there are regulatory frameworks related to DFS such as consumer protection, risk management, anti-money laundering measures, etc

#### Institutional support and capacity building

- ✓ If the bank facilitates partnerships and collaborations between financial service providers, agricultural value chain actors, and technology companies to expand DFS to smallholder farmers.
- ✓ Whether there are initiatives to build digital and financial literacy of smallholder farmers
- ✓ Qualitative insights into the factors influencing SDF adoption & use
- ✓ Challenges hindering the expansion of DFS in the country, opportunities/ perceived benefits of the DFS platform (such as electricity, telecom, insufficient network, unstable connectivity etc; technology, financial literacy and digital skills, security and privacy concerns/instances of fraud, identity theft, and cyber-attacks, etc)
- ✓ Any other comment to add

#### Specific Questions

1. How does your institution currently serve small holder farmers in terms of financial products and services?
2. What are the main challenges faced by small holder farmers in accessing traditional banking services, and how does your institution address these challenges?
3. Can you describe any existing digital financial services offered by your institution specifically tailored to the needs of smallholder farmers?
4. What are the key features of digital financial services that are most beneficial to smallholder farmers, based on your experience?
5. How does your institution assess the financial viability and market potential of offering digital financial services to smallholder farmers?
6. What strategies does your institution employ to ensure the affordability and accessibility of digital financial services for smallholder farmers, particularly in rural or remote areas?

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7. How do you measure the impact of digital financial services on the financial inclusion and empowerment of smallholder farmers?
8. Can you provide examples of successful partnerships between your institution and other stakeholders (such as government agencies, agricultural organizations, or technology providers) to promote digital financial inclusion for smallholder farmers?
9. What regulatory or policy frameworks do you consider necessary to support the development and expansion of digital financial services for small holder farmers?
10. Looking ahead, what opportunities do you see for your institution in further developing and scaling digital financial services for small holder farmers, and what challenges do you anticipate in doing so?

**b. Network infrastructure providers (MNOs – mobile network operators)**

- ✓ Number of active mobile subscribers in rural areas
- ✓ Data on mobile money users and transaction volumes
- ✓ Patterns of mobile phone usage among smallholder farmers
- ✓ Availability of mobile money services
- ✓ Types of financial services offered via mobile platforms (e.g., savings, loans, insurance)
- ✓ Accessibility of mobile services for various segments, including gender and age demographics
- ✓ Current state of network infrastructure and coverage in rural areas where smallholder farmers reside
- ✓ Data on the usage patterns of smallholder farmers in the company's network sphere
- ✓ State of DFS integration with other services like mobile banking and
- ✓ How the security and integrity of DFSs ensured especially for smallholder farmers who may not be familiar with digital transactions
- ✓ If there are any partnership or collaboration initiatives with financial service providers, agricultural value chain actors, or other stakeholders to enhance DFS for smallholder farmers
- ✓ Capacity building - initiatives emplaced to build the digital and financial literacy of smallholder farmers
- ✓ Key challenges faced
- ✓ Impacts witnessed on smallholder farmers' access to financial services
- ✓ examples of success stories or case studies from rural DFS projects if any

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Future plans and strategies to improve network infrastructure and enhance DFS to smallholder farmers

**c. Technology providers (Fintechs, Agritechs)**

- ✓ General information on DFS
  - o Types of DFS products and services tailored for smallholder farmers (e.g., mobile banking, digital wallets, agricultural insurance)
  - o Data on user adoption rates and engagement levels among smallholder farmers
  - o Insights into how smallholder farmers use their products and services
- ✓ If the platform is used for accessing DFS to small farmers
- ✓ If used, year started operation, purpose, market share and size (geography, size), etc
- ✓ Do you have any specific business model in place? (such as digitization of savings groups, credit processes, insurances, value chains, embedded finance/digital payment solutions, pay-as-you-go solutions, etc)
- ✓ Key adoption factors of DFS among users? (such as education level, access to mobile technology, availability of mobile network, reliable electricity, etc)
- ✓ Integration capabilities of the platform with other financial institutions and service providers
- ✓ Challenges encountered ..
  - o Technical, operational, and regulatory challenges faced in delivering DFS to rural areas
  - o Specific - such as government regulations, connection issues/inadequate network connectivity, unreliable electricity, digital literacy, and interest rates /for instance undefined interest rates/, etc
- ✓ Barriers to user adoption and engagement among smallholder farmers
- ✓ Key measures taken to overcome the challenges
- ✓ Major impacts (positive/negative)
  - o Impact on the financial inclusion and livelihoods of smallholder farmers
  - o Success stories and case studies demonstrating positive outcomes
  - o Specific - such as increased financial inclusion, improved productivity and household income, increased efficiency, cost reduction, revenue to government, etc)
- ✓ If the platform not used for DFS to small farmers, why
- ✓ Future plans in terms of partnerships and collaborations to expand and enhance quality of DFS coverage

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## **d. Interview Guide – Government Organizations and Associations**

### **Procedure**

The firm will appreciate your participation in this study. If you choose to participate, I will ask you questions about your personal experiences and opinions on Business Opportunities in Developing Digital Financial Services (DFS) for Small Holder Farmers (SHF). This study involves audio recording and note-taking of your interview with the researcher. Neither your name nor any other identifying information will be associated with the audio recording or the transcript. Only the research team will be able to listen to the recordings. The research team will transcribe the recordings and erase them once the transcriptions are checked for accuracy. The interview will take us about 20 minutes to complete.

### **Voluntary Participation**

Your participation is entirely voluntary, and you are free to take part or withdraw at any time without any consequences. You may choose to answer some or all of the questions posed.

### **Confidentiality**

Any information you provide will be kept private, and your identity will be kept confidential. None of the information you provide will be used in connection with your name or other identifying information.

### **Potential Risks**

This conversation will not be shared with your employer, colleagues, or anyone outside the small research team. Additionally, the study will not be used to provide individual-level feedback on specific employees or target institutions.

### **General Information**

Can you please introduce yourself, your name, organization, and position?

### **Questions**

1. What initiatives or programs has your organization implemented to support financial inclusion and digital financial services for smallholder farmers?
2. How does your organization collaborate with financial institutions, fintech companies, or other stakeholders to promote the adoption of digital financial services among smallholder farmers?
3. What policy or regulatory measures has your organization introduced to facilitate the development and deployment of digital financial services for small holder farmers?
4. Can you provide examples of successful partnerships between government agencies, private sector entities, and civil society organizations to promote digital financial inclusion for smallholder farmers?
5. What are the main challenges or barriers faced by government organizations in promoting digital financial services adoption among smallholder farmers?

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6. How does your organization measure the impact of digital financial services on the livelihoods and financial resilience of smallholder farmers?
7. What strategies does your organization employ to ensure that digital financial services are accessible and affordable for smallholder farmers, especially those in remote or underserved areas?
8. How important is capacity building and training for smallholder farmers in utilizing digital financial services, and what initiatives does your organization undertake in this regard?
9. What lessons or best practices has your organization learned from past experiences in implementing digital financial inclusion initiatives for smallholder farmers?
10. How do you envision the future of digital financial services for smallholder farmers, and what role do you see government organizations playing in shaping this future?

**e. Interview Guide, Bankers and Professional Association**

1. How does the Bankers Association perceive the current state of financial services for smallholder farmers?
2. What are the main challenges faced by small holder farmers in accessing financial services, particularly digital financial services?
3. From the perspective of the Bankers Association, what are the key benefits of expanding digital financial services for small holder farmers?
4. Can you provide insights into any existing initiatives or projects aimed at promoting digital financial inclusion for small holder farmers supported by the Bankers Association?
5. How does the Bankers Association collaborate with financial institutions and other stakeholders to support the development and deployment of digital financial services for small holder farmers?
6. What strategies does the Bankers Association recommend for overcoming barriers to the adoption of digital financial services among smallholder farmers?
7. How does the Bankers Association measure the impact of digital financial services on the financial inclusion and economic empowerment of smallholder farmers?
8. Can you share examples of successful partnerships between the Bankers Association and other stakeholders in advancing digital financial inclusion for smallholder farmers?
9. What policy recommendations does the Bankers Association have for governments and regulatory authorities to facilitate the expansion of digital financial services for smallholder farmers?

10. Looking ahead, what role does the Bankers Association envision playing in further developing and scaling digital financial services for smallholder farmers, and what opportunities and challenges do you foresee in doing so?

**f. Interview Guide, NGO, WB, IFC, AfDB**

1. How does your institution perceive the current landscape of financial services for smallholder farmers, particularly in terms of digitalization and financial inclusion?
2. What role does your institution see digital financial services playing in addressing the financial needs and challenges faced by small holder farmers?
3. Can you provide insights into any ongoing initiatives or projects supported by your institution aimed at promoting digital financial inclusion for smallholder farmers?
4. How does your institution collaborate with governments, financial institutions, and other stakeholders to support the development and deployment of digital financial services for small holder farmers?
5. What are the main barriers or challenges hindering the adoption of digital financial services among smallholder farmers, and what strategies are being employed to overcome these challenges?
6. From your perspective, what are the key success factors for scaling up digital financial services for small holder farmers, particularly in low-income or rural areas?
7. How does your institution measure the impact of digital financial services on the livelihoods and financial resilience of small holder farmers?
8. Can you share examples of best practices or success stories in digital financial inclusion for small holder farmers from your institution's experience?
9. What policy recommendations do you have for governments and regulatory authorities to create an enabling environment for the expansion of digital financial services for small holder farmers?
10. Looking ahead, what are the future prospects and opportunities for digital financial services in enhancing the financial inclusion and empowerment of small holder farmers, and how does your institution plan to contribute to these efforts?

**g. Interviews with experts/ prominent individuals/scholars**

Interviews with experts in the field of digital financial services could provide insights into existing gaps and potential opportunities.

1. What are the current challenges faced by small holder farmers in accessing financial services?

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2. In your experience, what role can digital financial services play in addressing the financial needs of smallholder farmers?
3. What are the key considerations for designing digital financial solutions specifically tailored to the needs of smallholder farmers?
4. Can you provide examples of successful digital financial service models that have been implemented for smallholder farmers in other regions or countries?
5. What are the potential business opportunities for financial institutions or fintech companies in developing digital financial services for smallholder farmers?
6. What are the main barriers or challenges to the adoption of digital financial services among smallholder farmers, and how can these be overcome?
7. How important is user education and awareness in promoting the adoption of digital financial services among smallholder farmers?
8. What regulatory or policy frameworks are necessary to support the development and deployment of digital financial services for smallholder farmers?
9. How can partnerships between financial institutions, technology companies, and agricultural organizations contribute to the success of digital financial services for smallholder farmers?
10. What are the potential risks associated with the implementation of digital financial services for smallholder farmers, and how can these risks be mitigated?

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