DIGITAL FINANCIAL INCLUSION FOR AFRICAN BORDERLANDS THROUGH COMMUNITY CREDIT UNIONS

PROCEEDINGS OF THE
UNDP AFRICA BORDERLANDS CENTRE
CO-CREATION DESIGN WORKSHOP

SEPT 2023

The UNDP Africa Borderlands Centre extends its gratitude to all those who contributed to this report and remains steadfast in its commitment to advancing the cause of financial inclusion, paving the way for a brighter and more prosperous future for the people living in Africa's borderlands.

CONTENTS

Foreword 3

Executive summary .4

Section 1: Introduction 6

Purpose and scope of the report 7

Section 2: Background to digital financial inclusion and access to finance in African border areas 8

Significance (and limitations) of digital financial inclusion 8

Innovative ecosystems 10

Enablers of innovative ecosystems in Africa's Borderlands 11

Challenges to innovation in Africa's borderlands 12

Section 3: Financial inclusion through community credit unions 13

The importance of community credit unions and village savings and loan associations in Africa's borderlands 13

Working through community credit unions to promote digital financial inclusion in Africa's borderlands 15

Challenges of working through community credit unions 16

Interoperability in border areas for cross-border payment 16

ICT options for community credit unions 18

Financial modelling and analytics 20

Challenges to financial modelling and analytics 21

Opportunities for financial modelling and analytics in Africa borderlands 22

Regulatory, legal and policy frameworks 22

Innovative opportunities to regulatory challenges in African borderlands 29

Training and capacity building practices 29

Alternative collateralization strategies 33

Alternative risk management approaches (including environmental, social and governance standards) 34

Bookkeeping and cashflow management 36

Targeting the most vulnerable sustainably 37

Section 4: Model for digital financial inclusion in Africa's borderlands 39

References 43

FOREWORD

The Africa Borderlands Centre of the United Nations Development Programme (UNDP) is proud to present this comprehensive report on “Digital financial inclusion for African borderlands through community credit unions.”

Financial inclusion is a topic of paramount importance in our ever-evolving world and nowhere is this truer than in the vibrant and diverse borderlands of Africa. These regions are characterized by unique challenges, in which geographical and socio-economic factors often combine to create barriers to financial inclusion. In recent years, strides have been made in the goal of ensuring access to essential financial services for all, yet significant challenges persist.

In particular, women and youth, who make up a substantial portion of Africa’s population, have faced persistent obstacles on their path to financial and economic empowerment. Limited financial literacy, inadequate infrastructure and insufficient access to traditional banking services have all contributed to this complex issue.

However, the emergence of digital technologies has ushered in a new era of hope and possibility. Digital financial inclusion has become a catalyst for change, reshaping the financial landscape across Africa’s borderlands. The World Bank’s definition of financial inclusion as “the access and use of formal financial services by individuals and businesses” underscores the fundamental importance of this endeavour for economic growth and development.

This report delves into the multifaceted dimensions of digital financial inclusion in Africa’s borderlands. The intricate tapestry of challenges and opportunities are examined, shedding light on the potential that community credit unions (CCUs) and village savings and loans associations (VSLAs) may hold in this transformative journey. These institutions have long served as beacons of financial hope for those in rural and low-income areas, and now they stand at the crossroads of a digital revolution.

The disruptive force of financial technology (fintech) has emerged as a game-changer in the financial sector, offering innovative solutions to bridge gaps that have persisted for far too long. By forging connections between CCUs, VSLAs and fintech platforms, the power of community-based solutions combined with technology can make financial services more accessible, affordable, trustworthy and convenient. The synergy between traditional community-based financial institutions and the dynamic world of fintech is a bridge to greater financial inclusion.

Embarking on this journey through the pages of this report allows readers to explore the profound impact that digital financial inclusion can have on the lives of countless individuals and businesses in Africa’s borderlands. It is hoped that the insights, analyses and recommendations contained within will serve as a valuable resource for policymakers, financial institutions, development organizations and all stakeholders committed to realizing the vision of a financially inclusive Africa.

---

[1]“Sixty percent of Africa’s 1.25 billion people are under age 25,” 18 January 2019, Brookings Institution (www.brookings.edu/articles/charts-of-the-week-africas-changing-demographics/).

EXECUTIVE SUMMARY

In recent years, limited access to finance has emerged as a pressing issue in Africa, especially in borderland regions. Despite concerted efforts by governments and international organizations to enhance access to financial services, a significant portion of the population, particularly women and youth, remains excluded from basic banking services. This exclusion is attributed to factors such as low financial literacy, inadequate financial infrastructure and limited access to traditional banking institutions. While Community Credit Unions (CCUs) and Village Savings and Loans Associations (VSLAs) have arisen as potential solutions to extend financial services to underserved populations, they encounter formidable challenges when attempting to scale their operations for broader impact.

A co-creation design workshop was held in Naivasha between 9-11 May 2022 attended by over 40 people from how ten countries to discuss digital financial inclusion and to articulate a model to harness fintech and new technologies so that they work for individuals and businesses, especially the most vulnerable, in Africa's border communities.

The design workshop's sessions addressed financial inclusion challenges faced by communities in Africa's borderlands as a foundation for arriving at conclusions, opportunities and recommendations. The sessions were:

- **Contextualizing the UNDP Africa Borderlands Centre's engagements on financial inclusion with community credit unions:** Exploring opportunities to bridge community credit unions with fintech for enhanced services.
- **ICT models and options for community credit unions:** Leveraging information and communication technology to bolster community credit union operations.
- **Interoperability challenges in border areas:** Addressing barriers to seamless financial transactions across borders.
- **Opportunities for interoperability in border areas:** Identifying avenues for fostering cross-border financial connectivity.
- **Financial modelling and analytics:** Utilizing data-driven insights for informed financial decision-making.
- **Regulatory, legal and policy frameworks:** Analyzing the regulatory landscape and policy implications.
- **Innovative solutions to regulatory challenges in borderlands:** Proposing creative approaches to overcome regulatory obstacles.
- **Virtual training and capacity building practices:** Enhancing knowledge and skills among financial service providers.
- **Alternative collateralization and risk management (including environmental, social and governance (ESG) standards):** Developing novel approaches to mitigate financial risks.
- **Bookkeeping and cash flow management:** Strengthening financial management practices and targeting the most vulnerable through designing inclusive strategies.

This report underscores the pivotal role that community credit unions can play in advancing financial inclusion in Africa's borderlands. By aligning CCUs and VSLAs with innovative financial technology (fintech) platforms, technology's transformative potential can be harnessed while rendering financial services to be more accessible, cost-effective and convenient. The advent of digital technologies has reshaped Africa's traditional banking landscape, extending financial services to previously unbanked populations. Digital financial inclusion, as explained in this report, presents a compelling avenue for accelerating economic growth and development in Africa's border regions.

The workshop participants formulated, as described in this report's recommendations, a comprehensive digital financial model that can address the financial needs of vulnerable individuals and businesses in borderland regions. The model consists of five key components, with the foundation being a web application developed in partnership with CCUs and existing technology providers. This application's design will be informed by rigorous risk assessments, vulnerability assessments, customer experience tracking and a deep understanding of the application programming interface (API) ecosystem. The model includes providing institutional capacity support and customized training programmes. It hopes to facilitate cross-border transactions, improve financial accessibility, encourage green growth and bolster climate resilience in the region.

SECTION 1:
INTRODUCTION

In the territorial margins of African nations, where border contact is a central feature of economic and political life, a quiet revolution is taking place. The power of digital financial inclusion is being brought to these often remote and vast regions. For too many years, Africa's borderland communities have had limited participation in national development processes and have needed to rely on cash transactions and bartering to get by. But now, thanks to the tireless efforts of private sector actors—in particular innovative financial technology (fintech) companies—this is changing.

In sub-Saharan Africa borderland areas, governments, non-governmental organizations, microfinance institutions, fintech firms and community-based organizations are collaborating fervently to enhance financial inclusion, offering wider access to financial services and nurturing entrepreneurship. This is being done through digital financial inclusion initiatives. Digital financial inclusion refers to the use of digital technologies to provide financial services to individuals who are excluded from or have limited access to the formal banking system. It is an essential component of financial inclusion, which aims to ensure that all individuals have access to affordable and appropriate financial services. Innovative ecosystems are proving to be pivotal to the pursuit of financial inclusion within Africa. Mbaye and Gueye (2020) emphasize that

---

[2]Innovation ecosystem refers to the network of actors, organizations and institutions that facilitate innovation and entrepreneurship in a particular region (Frenken et al., 2017). According to Carayannis et al. (2018), innovation ecosystems comprise six key elements: policy, finance, human capital, infrastructure, culture and institutions. The effectiveness of such ecosystems hinges on the synergy of these components.

innovation is indispensable for crafting financial products and services that are tailored to the unique needs of borderland residents. Often, traditional banking services remain inaccessible or cost-prohibitive for remote populations. This is where innovation can step in to craft financial solutions that bridge this gap.

The rise of digital financial services presents a remarkable opportunity to foster financial inclusion in borderlands. Compared to conventional banking, digital services offer greater convenience, accessibility and affordability. The proliferation of mobile money services across Africa underscores the potential. Mobile banking has emerged as a potent force, especially in regions where traditional banking is scarce. Fanta et al. (2021) highlight the pivotal role of mobile banking in bolstering financial inclusion in Africa's borderlands. By enabling access to banking services via mobile phones, mobile banking simplifies financial transactions. Through the embrace of mobile phones and other digital tools, borderland communities are breaking free from the shackles of financial exclusion, enjoying services that were once a distant dream.

From basic mobile payments to more complex transactions, digital financial inclusion holds the potential to transform lives and livelihoods. Yet, achieving digital financial inclusion in border areas cannot occur through innovative solutions alone; it demands also addressing infrastructure deficiencies, building trust in digital services, expanding financial literacy and surmounting regulatory hurdles.

Nonetheless, despite the concerted efforts of governments, non-governmental and community organizations, international organizations and private sector actors, significant portions of borderland populations still grapple with a lack of basic banking services.

Purpose and scope of the report

This report is not just a story about technology. It is a story of ingenuity and perseverance, and specifically of how experts and stakeholders in financial inclusion and innovation came together for a workshop in May 2022 at which they imagined how to construct an ideal model to enhance financial inclusion in Africa's borderlands. Those gathered imagined how borderland communities might find new ways to thrive in the face of adversity.

This report covers the proceedings of the gathering—a design workshop on digital financial inclusion—and discusses the importance of digital financial inclusion in promoting access to finance in Africa's borderlands, including its benefits, challenges and potential solutions.

The workshop was attended by experts drawn from cross-border trader associations, governments, community credit unions, fintech, academia, financial institutions, the United Nations and the Africa Union. Herein, readers will find a summary of the discussions and recommendations made during the workshop, focusing on the key themes of digital payments, mobile money and regulatory frameworks.

The report aims to provide insights and guidance for policymakers, financial institutions and other stakeholders working towards the goal of promoting financial inclusion through digital means in border regions of Africa.

SECTION 2:
BACKGROUND TO DIGITAL FINANCIAL INCLUSION AND ACCESS TO FINANCE IN AFRICAN BORDER AREAS

The vast and diverse landscapes of Africa's borderland areas are home to a rich tapestry of cultures, languages and communities. However, in these areas access to finance is a significant challenge. The lack of formal financial institutions, inadequate infrastructure and resources, low levels of financial literacy, inadequate government policies and a high level of informality often make it difficult for individuals and businesses to access finance in these areas (Zeller and Sharma, 2019).

Several studies have shown that financial inclusion has positive effects on economic growth and poverty reduction. According to Beck and Cull (2014), financial development contributes to economic growth, particularly in low-income countries. Moreover, financial inclusion increases access to credit, which can help households and businesses to invest in income-generating activities.

Traditional financial institutions often require collateral or a credit history, which many individuals and small businesses in borderlands may not have. Moreover, traditional financial institutions are often located in urban areas, making it difficult for individuals in remote regions to access their services. This leaves millions of people excluded from formal financial services, such as banking, loans and insurance. Financial exclusion exacerbates poverty, inequality and hinders economic growth in the borderlands.

To address these challenges, digital financial inclusion has emerged as a promising solution for borderland communities. At the heart of this transformation is the power of technology. Digital financial services, such as mobile money and e-wallets, are rapidly gaining traction across Africa's borderlands, offering a convenient and secure way for individuals and businesses to access financial services. These services are often provided by non-bank financial institutions, such as mobile network operators and innovative fintech companies, which have lower operating costs. Through harnessing technology, these providers can offer seamless and user-friendly financial services in isolated, rural and border areas without the need for physical branches or face-to-face interactions.

The digital landscape has opened new avenues for financial inclusion in Africa's borderlands, where traditional financial institutions have struggled to penetrate due to infrastructural limitations and geographical remoteness. With the rise of innovative digital technologies, financial inclusion has become more attainable than ever before, bringing hope to millions of people in the African continent's periphery areas, unlocking new opportunities and driving economic growth.

Significance (and limitations) of digital financial inclusion

According to a study by the World Bank, more than 66 percent of adults in sub-Saharan Africa do not have access to a bank account (Demirguc-Kunt, Klapper, Singer, and Van Oudheusden, 2018). Digital financial inclusion helps bridge this gap by providing access to financial services through mobile money and other digital channels. Digital financial services remove the need for physical infrastructure, which can be costly to build and maintain. Thus, the cost of accessing financial services is reduced, the convenience of financial transactions is increased, financial transparency is enhanced and the ability of individuals and businesses to save, invest and access credit, among other services, is improved.

Digital financial inclusion has the potential to transform the lives of individuals and communities in Africa's borderlands. The benefits of providing access through digital platforms to formal financial services that were once out of reach are manifold. For individuals, it means allowing them to save, borrow, make payments more efficiently, get insurance and invest in their futures. For businesses, it means easier access to capital and credit giving them the ability to start and expand their operations, create jobs in their communities and drive economic growth. And for governments, it means a more efficient and transparent way to distribute social welfare payments and collect taxes.

Digital financial inclusion helps reduce poverty and inequality by increasing access to financial resources for marginalized populations, including women, remote communities and small-scale farmers. Digital platforms can provide these groups with access to financial services that were previously unavailable, such as mobile money, microloans and savings accounts. Moreover, digital financial services help promote financial literacy and increase access to information about financial products and services. This can empower individuals to make informed financial decisions and improve their financial wellbeing (Mbiti and Weil, 2019).

Mobile money platforms, such as M-Pesa in Kenya and Tanzania, have already gained significant traction in Africa, with more than 469 million registered accounts across the continent. Mobile money services are now available in 96 percent of countries in sub-Saharan Africa (GSMA, 2020). Moreover, mobile money has enabled more people to access financial services, including credit, insurance and savings. These platforms have demonstrated the potential of digital financial services in promoting financial inclusion in borderland areas.

It should be noted that some limitations to financial inclusion also exist (see Figure 1), including geographic isolation, lack of formal identification and low levels of financial literacy and limited access to credit.

Figure 1: **Limitations of financial inclusion**

Innovative ecosystems

Innovation is considered a key driver of development throughout the modern world. It is a catalyst that helps to improve the economic, social and environmental conditions of a region. However, innovation is not evenly distributed across the globe and some regions lack the resources, skills and infrastructure to foster innovation. In Africa, the borderlands have been identified as areas that are lagging in terms of both development and innovation.

Nonetheless, in recent years, innovation has been embraced in Africa's borderlands, with the aim of driving economic growth, improving living standards, increasing access to markets and creating employment opportunities. Innovation is seen as a way to address the unique challenges of these regions. Access to finance, however, remains a significant barrier to innovation in borderland regions (Aker and Mbiti, 2010). Innovation here remains at an early stage, with limited investment and attention from policymakers, investors and the private sector.

Innovation ecosystems play a critical role in promoting financial inclusion in borderlands in Africa. Effective innovation ecosystems are required to facilitate the creation and development of innovative financial products and services that are accessible and tailored to the needs of underserved communities, including businesses and individuals. Such ecosystems can be achieved by promoting collaboration between financial institutions, technology companies and other stakeholders. One method is to undertake risk-sharing mechanisms, such as guarantees and insurance, which can reduce the perceived risk of investing in underserved communities (Carayannis et al., 2018).

According to Aker and Mbiti (2010), innovation can be defined as the process of creating and implementing new ideas that address the needs of customers. In the context of financial inclusion, innovation can take many forms, including the development of new products and services, the use of new technologies and the creation of new business models. An innovation ecosystem that supports and nurtures these ideas is essential to achieving financial inclusion in borderlands.

Innovation in Africa's borderlands is driven by a combination of factors—government policies, private sector investment, social and economic aspects—and a variety of actors, including entrepreneurs, researchers and non-governmental organizations. These actors are often motivated by a desire to address pressing social and economic challenges, such as poverty, food insecurity and lack of access to healthcare.

Several examples of innovative initiatives are taking place in the borderlands of Africa. For instance, the Lake Chad Basin region, which spans Chad, Cameroon, Niger and Nigeria, is one of the poorest and most conflict-affected areas in the world. Yet, it is also a region with significant potential for agriculture, fisheries and renewable energy. The Lake Chad Basin Commission, with the support of international partners, launched several innovative projects to enhance the productivity and resilience of the region. These projects include the promotion of sustainable land management, the development of solar-powered irrigation systems and the establishment of cross-border trade corridors (Okeke-Uzodike and Okeke-Uzodike, 2019). Such initiatives demonstrate the potential of innovation to transform the borderlands of Africa.

Enablers of innovative ecosystems in Africa's Borderlands

> *"The power of digital financial inclusion lies in its ability to reach those who have been left behind by traditional banking systems."*
> ***- Segun Olusola,***
> *workshop participant and expert on cooperatives*

Innovation ecosystems to promote digital financial inclusion in borderlands can be supported by a range of actors, including government agencies, non-profit organizations, universities and private sector companies. For example, the government can provide funding and regulatory support for innovation projects, while non-profit organizations can provide technical assistance and capacity building for entrepreneurs. Universities can play a role in supporting innovation by providing research and development support, as well as training and education for innovators. Private sector companies can contribute to innovation ecosystems by investing in startups and providing access to markets and distribution channels.

The fintech industry in Africa borderlands has been growing rapidly in recent years. According to a report by the Global System for Mobile Communications Association (GSMA), the number of mobile money accounts in Africa's borderlands increased by 18 percent between 2018 and 2019, reaching 469 million people (GSMA, 2020). This growth has been driven by startups and their innovative products and services.

Digital financial inclusion startups are using digital technologies to provide financial services to people who are excluded from traditional banking services. For example, mobile money services allow people to send and receive money using their mobile phones, without the need for a bank account. Startups such as M-Pesa in Kenya, Paga in Nigeria and EcoCash in Zimbabwe have been instrumental in expanding digital financial inclusion in Africa's borderlands.

Startups are also driving technology adoption in the financial services sector. They are using technologies such as blockchain, artificial intelligence (AI) and machine learning to develop new products and services. For example, blockchain technology is being used to create decentralized finance (DeFi) platforms that enable users to access financial services without intermediaries. Startups, such as BitPesa in Kenya and Paxful in Nigeria, are using blockchain technology to facilitate cross-border payments and remittances.

Challenges to innovation in Africa's borderlands

Significant challenges need to be addressed to foster innovation in the borderlands of Africa. These challenges include limited access to finance, weak institutions, inadequate infrastructure and a shortage of skilled human resources. Moreover, the borderlands of Africa are often characterized by ethnic and religious diversity, which can lead to conflicts and hinder cooperation. Therefore, it is crucial to adopt a holistic and inclusive approach to innovation that considers local contexts and involves all relevant stakeholders.

SECTION 3: FINANCIAL INCLUSION THROUGH COMMUNITY CREDIT UNIONS

The importance of community credit unions and village savings and loan associations in Africa's borderlands

Community credit unions and village savings and loan associations have emerged as important alternatives to formal financial institutions in many parts of sub-Saharan Africa, making them critical components of economic development. These community-based organizations are an essential means of providing financial services, especially in remote communities such as Africa's borderlands. They are generally more accessible and more responsive to the needs of their members than formal financial institutions. They typically offer a range of financial services, including savings accounts, loans and insurance.

CCUs and VSLAs have been shown to have positive effects on the economic well-being of communities. For instance, Masinde and Brown (2018) found that VSLAs have a significant impact on the financial and social well-being of communities in Kenya's borderland areas. They found that VSLAs provide a vital means of financial support for women entrepreneurs in these communities.

CCUs are member-owned financial institutions that provide credit and other financial services to their members. They are typically formed by people who share a common bond, such as living in the same community or belonging to the same profession or trade. CCUs are particularly important in rural and low-income areas, where access to formal financial services is limited.

VSLAs are also popular in Africa's borderlands. VSLAs are typically formed by people who share a common bond, such as living in the same community or belonging to the same ethnic group. Members contribute a fixed amount of money to a communal fund on a regular basis and can borrow from this fund. The loans are usually low interest or interest free and members pay back the loans over a specified period. VSLAs are managed by members and are based on trust and transparency.

One of the key advantages of CCUs and VSLAs is that these organizations are mostly founded and run by members of the community, which builds trust and establishes a sense of ownership and responsibility among members. (In comparison, fintech companies are technology-driven financial institutions usually owned by investors.)

***Figure 2*: Opportunities for linking community credit unions and village savings loan associations to fintech**

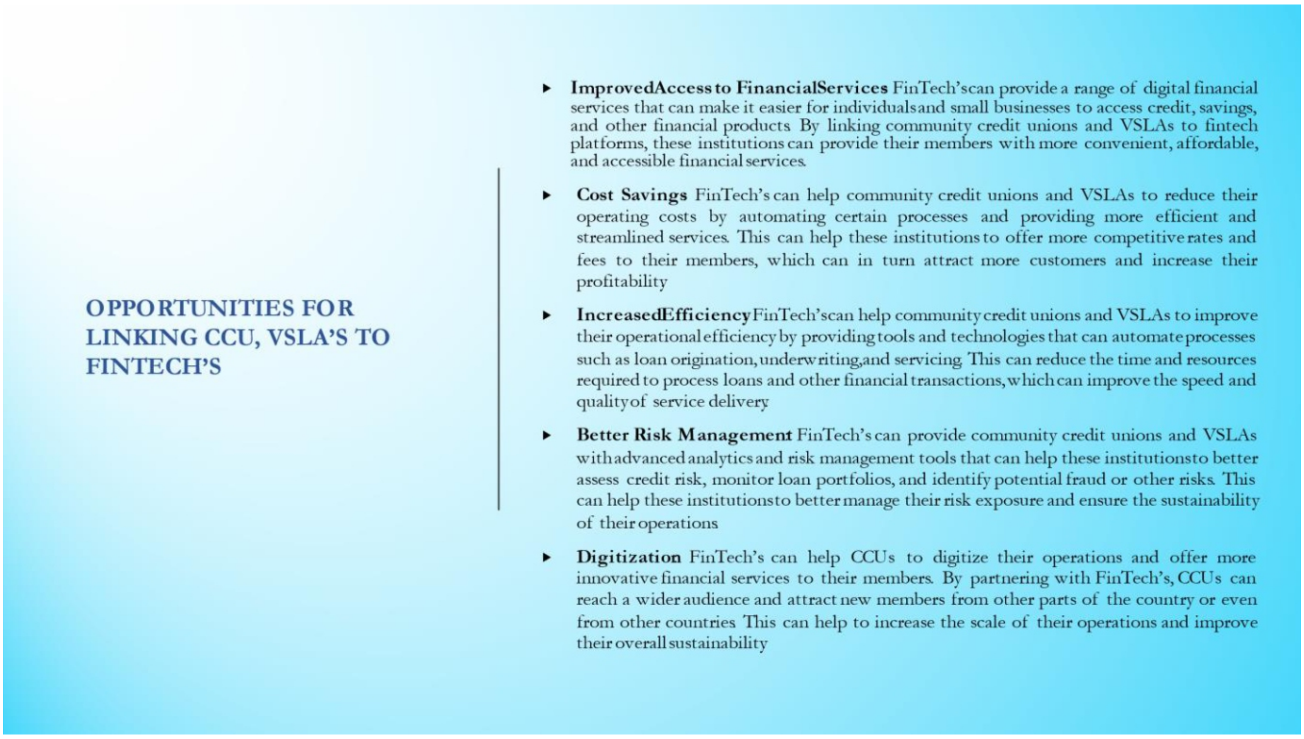
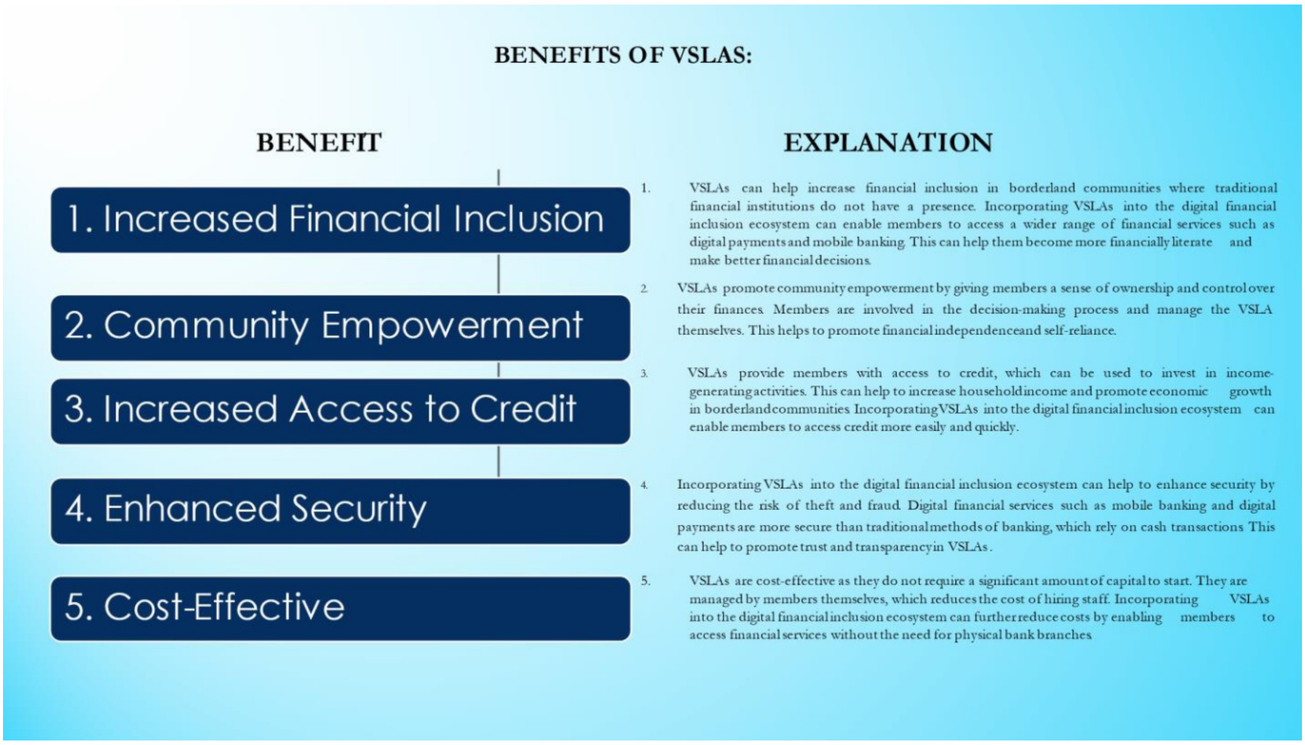


***Figure 3*: Benefits of involving village savings and loan associations in digital financial inclusion efforts**



Working through community credit unions to promote digital financial inclusion in Africa's borderlands

One promising approach to overcome challenges of access to finance and promote financial inclusion in African borderlands as noted by participants during the co-creation design workshop, is working through community credit unions. While some CCUs have embraced digital financial services, others have been slow to adopt them.

Incorporating CCUs and VSLAs into the ecosystem of fintech has several benefits. CCUs and VSLAs are typically formed by people who are excluded from formal financial services, and they often lack the resources to start their own businesses or invest in other income-generating activities. By linking CCUs and VSLAs to fintech, these groups can access more formal financial services and build their financial capacity over time.

Additionally, specifically linking VSLAs to CCUs can provide a valuable source of new members for CCUs. By partnering with VSLAs, CCUs can reach out to new communities and attract new members who may not have been aware of the services offered by the credit union.

Tsoho et al (2018) notes that CCUs offer several advantages when it comes to promoting digital financial inclusion, including their embeddedness within borderland communities and their member-owned structure (Tsoho, et al, 2018). This characteristic makes them well placed to understand the unique challenges and opportunities in borderland regions and the individual situations of their members.

By leveraging digital financial services, CCUs can provide more affordable and accessible financial services to their members (Tsoho, et al, 2018). Tariro Nyimo, Deputy Divisional Director at Digital Financial Frontiers noted that: "Community credit unions are instrumental in promoting financial literacy among their members, which has led to increased savings and improved financial management." Additionally, because

CCUs are member-owned, they are more likely to prioritize the needs of their members over profits, which can lead to the provision of more affordable and accessible financial services.

Moreover, according to Ogunleye and Ayorinde (2019), CCUs can leverage digital financial services to reach more people and provide more services. For example, while digital financial services have the potential to empower individuals, CCUs can use mobile money platforms to offer more localized basic financial services to members who do not have access to traditional banking services. Mobile money platforms allow CCUs to offer services such as deposits, withdrawals and transfers through mobile devices, which can be accessed by individuals in remote areas. The main advantage of CCU's over individuals is their ability to pool resources and provide access to affordable financial services, fostering financial inclusion and mutual support within a local community.

Therefore, the workshop concluded that focusing on CCUs is a viable strategy for promoting digital financial inclusion in African borderlands.

Challenges of working through community credit unions

While CCUs have shown promise in promoting digital financial inclusion in Africa borderlands, their efficacy in achieving this goal is still limited. During the Co-creation design workshop, participants noted barriers to the adoption of digital financial services by CCUs, including the lack of technological infrastructure (in particular lack of access to reliable and affordable internet connectivity in rural areas), lack of technical capacity, inadequate training of staff and members and limited access to financial resources.

One workshop participant added that: "In borderlands, many community credit unions lack resources to invest, and the majority may be unable to compete with larger financial institutions that have the resources to invest in cutting-edge technology."

Another barrier to adoption of digital financial inclusion by CCUs is a less than ideal regulatory environment and limited government funding. Governments can play a critical role in promoting digital financial inclusion by creating enabling environments that support innovation and investment in digital financial services. Currently, however, in many African borderlands, the regulatory environment is not conducive to the growth of digital financial services. Regulatory barriers, such as high licensing fees and complex regulations, have hindered the growth of digital financial services.

Another challenge is the limited reach of CCUs, which may not be able to provide services to all individuals in underserved borderland areas. The limited resources and capacities of CCUs means they may not be able to serve all members effectively.

Interoperability in border areas for cross-border payment

Interoperability plays a critical role in facilitating cross-border transactions in African borderlands where there are many challenges to the movement of money across borders. Interoperability in cross-border payments refers to the ability of different payment systems to seamlessly communicate and exchange information with each other. It is essential for cross-border payments because it enables different payment systems to work together, ensuring that funds can be transferred across borders efficiently and securely.

In African borderlands, interoperability in cross-border payments has been challenging due to fragmented payment systems in the region. Most countries have their own payment systems, which often operate on different platforms and have different technical standards. This makes it difficult for payment systems in different countries to communicate with each other and exchange information seamlessly.

Moreover, the lack of standardization in financial systems further complicates interoperability. Financial systems in border areas of Africa are often developed by different companies, with varying standards and protocols. The lack of standardization leads to high costs associated with integrating different financial systems.

One of the significant challenges is the lack of standardization in payment systems. Payment systems in different countries use different standards and protocols, making it challenging for these systems to work together seamlessly. For example, in some countries, payment systems may use different formats for transaction data, making it difficult for these systems to communicate with each other.

Another significant challenge is the high costs associated with cross-border payments. Financial institutions often charge high fees for cross-border payments, making it challenging for individuals and businesses to conduct these transactions. Moreover, currency exchange rates can also lead to high costs for cross-border payments.

Regulatory barriers also exist. Regulatory requirements differ in countries, making it difficult for financial systems to work together across borders. Regulatory barriers can include different licensing requirements, currency restrictions and foreign exchange controls. These barriers make it challenging for customers to conduct cross-border transactions seamlessly.

Despite these challenges, significant opportunities exist for interoperability in the border areas of Africa. One example is mobile money which has emerged as a popular payment system in these regions, with more than 100 million active mobile money accounts in Africa. Mobile money offers a low-cost, accessible and secure means of transferring money, making it an ideal platform for promoting interoperability. Moreover, the growth of fintech start-ups and other innovative financial service providers has created new opportunities for interoperability.

There have been other efforts to address interoperability challenges in recent years; a number of them are described below.

- The African Payment System Integration Initiative (APSI) is a collaboration between the African Development Bank, the African Union Commission and the African Export-Import Bank, among other stakeholders, to enhance the interoperability of payment systems across Africa

- The East African Community (Burundi, Kenya, Rwanda, Tanzania and Uganda) has launched a regional payment system called the East African Payment System (EAPS) to facilitate cross-border payments within the region. However, interoperability challenges still arise due to differences in financial regulations across the countries.

- Mobile money interoperability has been successful in some African countries, such as Kenya, Rwanda and Tanzania. Mobile money interoperability enables users of different mobile money platforms to send and receive money across platforms, regardless of the mobile operator. This has significantly reduced the cost and time of sending money across borders in these countries.

- The West African Monetary Zone (WAMZ), which consists of six countries, has launched a regional payment system called the West African Monetary Zone Payment System (WAMZPS). This system facilitates cross-border payments within the region. However, interoperability challenges arise due to differences in payment system standards and regulations across the countries.

- The West African Economic and Monetary Union (WAEMU) has implemented a regional payment system called "Système de Paiement Automatique et de Règlement" (SPAR) to facilitate cross-border payments among its member countries. However, the system is not yet fully interoperable with other payment systems outside the region, creating challenges for international trade.

- The Southern African Development Community (SADC) has implemented a regional payment system called the Regional Electronic Settlement System (RESS) to facilitate cross-border payments among its member countries. However, the system is not yet fully interoperable with other payment systems outside the region, creating challenges for international trade.

Furthermore, the adoption of blockchain technology has been seen as a potential solution to interoperability challenges in cross-border payments. Blockchain technology can enable different payment systems to communicate with each other in a decentralized and secure manner, without the need for intermediaries.

ICT options for community credit unions

Technology is at the core of digital financial inclusion and the fintech landscape in African border areas. Fintech companies are leveraging technology to develop innovative financial solutions that are accessible, affordable and convenient. Digital banking, blockchain technology and cross-border payments have played a significant role in the development of the fintech industry in African border areas. For CCUs, they can leverage technology for their benefit with by using ICT options, such as digital banking, cross-border payments and blockchain technology to be used. (see Figure 4).

***Figure 4*: ICT options for community credit unions**

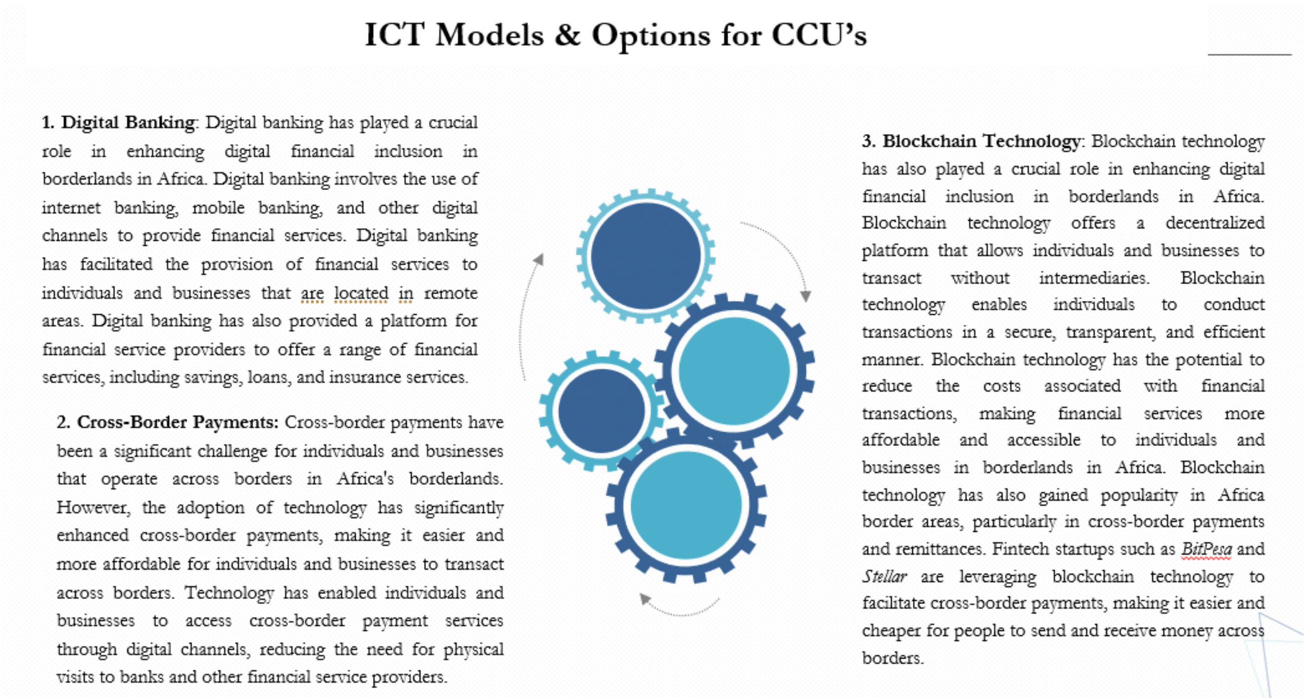
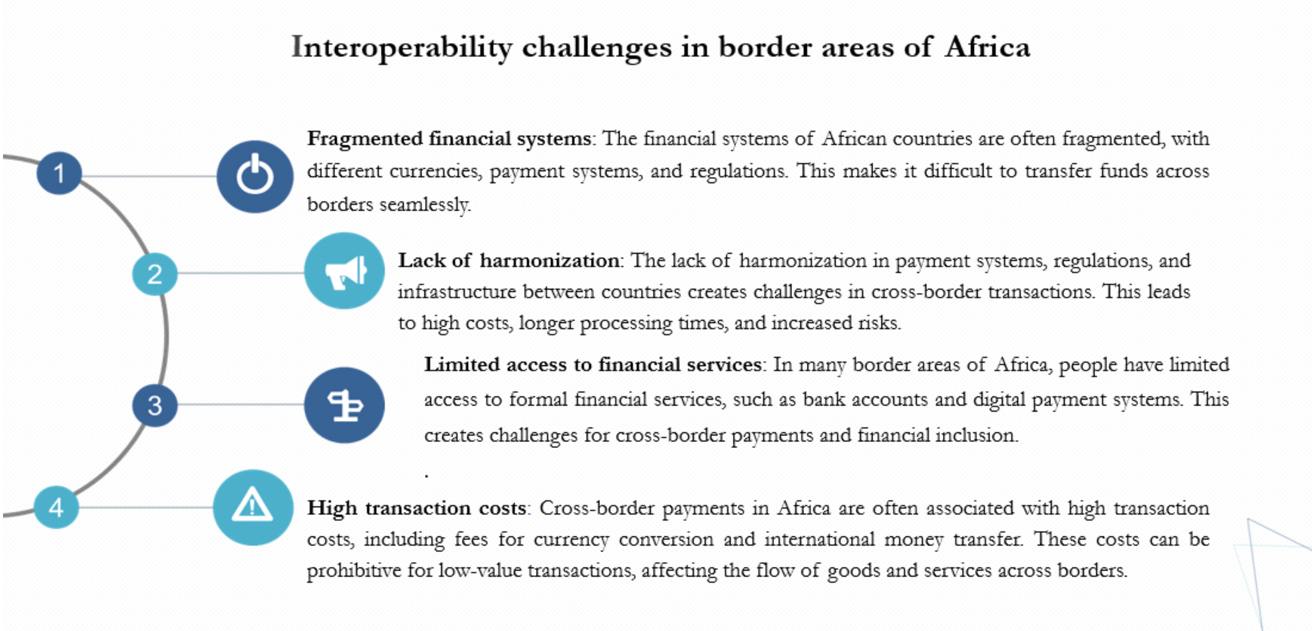


***Figure 5*: Interoperability challenges in border areas of Africa**



To address interoperability challenges in cross-border payments in Africa, the below solutions can be considered.

1. Harmonize payment systems, regulations and infrastructure across borders to facilitate cross-border transactions.
2. Create regional payment systems that are interoperable with other payment systems outside the region.
3. Promote financial inclusion to ensure that people in border areas have access to formal financial services, including digital payment systems.
4. Reduce transaction costs, including fees for currency conversion and international money transfer, to promote the flow of goods and services across borders.

Financial modelling and analytics

> *"Regarding cross-border payments and digital trade, Smart Africa examined existing gaps and why they exist in the cross-border payment ecosystem. One finding is that some persons are inhibited from cross-border movements due to a lack of identity documentation."*
> ***Emmanuel Kisia,*** *Smart Africa, workshop participant*

Financial modeling and analytics are essential tools for evaluating and predicting financial performance, risk and profitability. In the context of digital financial inclusion in African Borderlands, financial modeling and analytics can help to identify opportunities and challenges, assess the impact of interventions and develop effective strategies to promote financial inclusion. Every borderland is different as informed by infrastructure and demographics, such as age and gender, and different payment methods (for example, South Sudan and Ethiopia use cash while Kenya mainly uses Mpesa), etc. It is therefore critical to understand the ecosystem, including existing fintechs, and the unique challenges.

Developing viable financial models and analytics requires understanding that borderlands are regulated by multiple and different central banks. Harmonizing regulatory frameworks, therefore, is critical; the continent could adopt the European Union passporting model, whereby if a license is granted in one country, there will be no need to apply for licenses in the other countries.

Machine learning

One example of financial modelling and analytics in African borderlands is the use of machine learning to predict credit risk (Buba, EcoBank). In Kenya, a study used mobile phone data to predict the creditworthiness of individuals in rural areas who do not have traditional credit histories. The study found that machine learning models using mobile phone data were more accurate in predicting credit risk than traditional credit scoring methods. This approach could help to expand access to credit for individuals in African borderlands who are excluded from traditional financial services (Kshetri, 2020).

Agent network modelling

Another example of financial modeling in African borderlands is the use of agent network models to determine the optimal placement of mobile money agents. For example, researchers in Tanzania used agent network models to determine the optimal placement of agents in rural areas, resulting in an increase in the number of mobile money users and transactions (KPMG, 2016).

These models use data on agent performance, transaction volumes and network costs to identify opportunities to optimize agent placement and improve network profitability. For example, a study by the International Finance Corporation (IFC) used agent network optimization models to identify opportunities to improve the profitability of mobile money networks in Burkina Faso, Mali and Senegal. The study found that optimizing agent placement could increase network profitability by up to 30 percent (IFC, 2017).

Satellite imagery and geo-spatial analysis

Geospatial analysis can be used to map financial inclusion in African borderlands. Geospatial analysis involves the use of geographic information systems (GIS) to analyze data related to financial services and infrastructure. For example, a study by the Consultative Group to Assist the Poor (2017) used GIS to map the locations of mobile money agents in the Democratic Republic of Congo and identify areas where additional agents were needed to improve access to digital financial services. The study found that many areas of the country had no mobile money agents within a five-kilometre radius, indicating significant gaps in financial service coverage.

Satellite imagery and machine learning has also been used to predict crop yields in African borderlands. In Tanzania, a study used satellite imagery to predict crop yields, which could help farmers access credit by providing information about their expected crop production. This approach could help increase financial inclusion in African borderlands by enabling farmers to access credit based on their expected crop yields rather than their traditional credit histories (Baker et al., 2021).

Financial analytics

Analytics can also be used to understand the behaviour of users in African borderlands. For example, transactional data can be analyzed to understand the impact of mobile money on financial inclusion and poverty reduction (Demirguc-Kunt et al., 2018).

Challenges to financial modelling and analytics

Despite the potential benefits of financial modeling and analytics in African Borderlands, there are limitations and challenges. For example, data quality can be a major issue, particularly in areas with low levels of connectivity and infrastructure (Jack and Suri, 2014). Additionally, there may be biases in the data that can affect the accuracy of the models and analytics.

Opportunities for financial modelling and analytics in Africa borderlands

There are examples of successful applications of financial modeling and analytics to digital financial inclusion in African borderlands and other parts of the world. For example, a study by Ndemo and Owuor (2019) used data from mobile money transactions in Kenya to develop a model that predicts the impact of mobile money on poverty reduction. The study found that mobile money has a significant positive effect on poverty reduction, particularly for women and rural households. Another study by Aiyar et al. (2020) used machine learning algorithms to identify factors that influence the adoption and usage of digital financial services in rural India. The study found that factors such as education, income and social networks were significant predictors of digital financial service usage.

Regulatory, legal and policy frameworks

> *"A major challenge, however, [...] is the lack of motivation by policymakers to support policies for financial inclusion. Some regulatory authorities are learning about financial inclusion on-the-job and require capacity building. There should be strong regulations also guiding the technical design of digital products, such as cybersecurity, taxation, financial protection rights and intellectual property, as outlined in the African Union's Convention on Cybersecurity and Cyber Protection (2014)."*
> ***- OECD (2020),*** *Advancing the Digital Financial Inclusion of Youth.*

Digital financial inclusion has been heralded as a game changer in the provision of financial services to the unbanked population in Africa. The regulatory environment of digital financial inclusion in borderlands is a critical issue due to its potential to drive financial inclusion, spur economic growth and improve the standard of living of people in these regions (Mas and Radcliffe, 2010).

The regulatory environment refers to the rules and regulations put in place by governments and other regulatory bodies to ensure that financial services are safe, secure and accessible to all citizens. The framework refers to the overall structure and organization of the digital financial system, including the policies, procedures and infrastructure that are necessary for it to operate effectively.

The regulatory environment in African borderlands presents a significant challenge; it has been plagued by inadequate infrastructure, poor digital literacy, weak legal frameworks and limited access to banking services, among other challenges. A lack of regulatory clarity and the absence of an enabling environment for digital financial services are common challenges facing the industry across the continent.

The regulatory environment and framework of digital financial inclusion in African borderlands, however, does vary widely, depending on the country's political and economic conditions. In some countries, such as Kenya and Nigeria, governments have introduced policies to promote financial inclusion, while others have made little progress in this area.

In Kenya, the government has taken several steps to promote digital financial inclusion, including the establishment of the National Payments System Department and the adoption of the National Payment System Act. The Act provides a legal framework for electronic payments, which has facilitated the growth of mobile money services, such as M-Pesa. In Nigeria, the Central Bank of Nigeria introduced a range of policies to promote financial inclusion, including the National Financial Inclusion Strategy, the Microfinance Policy Framework and the Guidelines for the Regulation and Supervision of Microfinance Banks (Central Bank of Nigeria, 2021).

Table 1: **Analysis of regulatory frameworks in African countries**

Item	Description	Challenge(s)	Opportunity(s)
Licensing requirements for DFS providers	**East Africa**: Many East African countries have established licensing requirements for DFS providers. These requirements often include capital adequacy, operational standards and compliance with anti-money laundering (AML) regulations. For example, Kenya's Central Bank regulates mobile money operators like Safaricom's M-Pesa. **West Africa**: Countries in this region also require DFS providers to obtain licenses. Nigeria, for instance, has a comprehensive framework overseen by the Central Bank of Nigeria, which issues licenses and sets guidelines for mobile money operators. **Southern Africa**: Licensing requirements for DFS providers exist in this region as well. South Africa, for example, has a well-defined licensing regime for electronic money institutions regulated by the South African Reserve Bank.	**Regulatory fragmentation and inconsistency**: It is challenging for DFS providers to operate across borders. DFS providers must navigate a complex web of regulations, often inconsistent from one country to another. This creates a barrier to scaling operations and increases compliance costs. **Inclusion and access:** While digital financial services have the potential to greatly expand financial inclusion in Africa, there is a challenge in ensuring that licensing requirements do not inadvertently exclude marginalized populations.	Many countries have established regulatory authorities that oversee digital financial services and require providers to obtain licenses. These requirements may vary in terms of capital thresholds, governance standards and operational conditions. While these regulations create a framework for ensuring consumer protection and financial stability, they also present an opportunity for responsible DFS providers to enter the market, adhere to these standards and contribute to the growth of secure and vibrant digital financial ecosystems.

	East Africa: East African countries have been at the forefront of mobile money adoption, with	**Lack of clarity** on the regulations governing digital financial services, which has led	Streamlining regulations and ensuring they are conducive to innovation while maintaining
Regulations governing mobile money and e-wallets	regulations often facilitating innovation. In Kenya, mobile money services like M-Pesa are regulated and have significant flexibility in product offerings. **West Africa:** Mobile money regulations in West Africa tend to be stricter, focusing on ensuring financial stability and security. In Nigeria, mobile money services are well-regulated by the Central Bank of Nigeria. **Southern Africa:** Southern African countries also have regulations in place for mobile money and e-wallets. South Africa, for instance, regulates mobile payment services through the National Payment System Act and the South African Reserve Bank (SARB) that oversee licensing requirements for digital financial services.	to confusion and uncertainty for both service providers and users. This lack of clarity has also led to the proliferation of unregulated digital financial service providers, which pose significant risks to users. **Regulatory frameworks vary widely** across countries, creating gaps and inconsistencies in the digital financial ecosystem.	consumer protection is essential.

Interoperability	**East Africa**: Many East African countries have embraced interoperability between DFS providers, allowing users to transact across different platforms. Tanzania's mobile money interoperability is a notable example. **West Africa**: Interoperability efforts are ongoing in West Africa, with some countries making progress. Ghana's Mobile Money Interoperability System is an initiative aimed at promoting interoperability. **Southern Africa**: Interoperability is less common in Southern Africa, although some countries are exploring the possibility of cross-platform transactions.	**Fragmented regulatory frameworks:** The lack of harmonization and standardization in regulatory frameworks hinders interoperability efforts. DFS providers often need to comply with different rules and requirements in each country they operate, making seamless cross-border services difficult. **Technical compatibility:** DFS providers in Africa often use different technologies, payment systems and standards. Interoperability requires standardization of technical protocols, data formats and communication interfaces to ensure different systems can seamlessly exchange information and transactions.	**Standardization**: Developing common standards for data exchange and payment protocols can enhance interoperability among providers. **Collaborative initiatives**: Industry partnerships and consortiums can foster cooperation and interoperability among financial service providers.

Know Your Customer and Anti-Money Laundering/Combating the Financing of Terrorism (AML/CFT) requirements	**East Africa**: Know Your Customer and AML/CFT regulations are generally stringent in East Africa to prevent fraud and money laundering. **West Africa**: Similar to East Africa, West African countries have robust Know Your Customer and AML/CFT requirements to ensure the integrity of digital financial services.	**Limited access to identification documentation:** Many individuals in borderlands, especially in rural and underserved areas, lack formal identification documents, such as government-issued IDs or passports. This poses a significant challenge for digital financial service providers when trying to implement Know Your Customer procedures. Without proper identification, it becomes	**Digital identification systems and biometrics** are gaining traction for Know Your Customer purposes. Collaboration with telecom providers and fintech companies can help expand access to digital identification.
	Southern Africa: Know Your Customer and AML/CFT requirements are also in place in Southern Africa, but enforcement and implementation may vary.	difficult to verify the identity of customers, which is a fundamental requirement for Know Your Customer compliance.	
Inconsistencies and inefficiencies	**Regulatory inconsistencies:** Diverse and sometimes conflicting regulations across jurisdictions create barriers for fintech companies and digital financial service providers. Inefficiencies arise from navigating these complex regulatory landscapes.	**Inadequate legal frameworks** are also a challenge facing digital financial inclusion in African borderlands. Lack of trust in formal financial institutions exists in many African borderland communities, which has led to a preference for informal financial services (Alliance for Financial Inclusion, 2021).	**Innovation and product diversity:** Regulatory inconsistencies can create room for innovation in product design and service delivery. Providers can tailor their offerings to navigate the varying regulatory requirements in different African countries.

Innovative opportunities to regulatory challenges in African borderlands

Despite existent regulatory challenges, there have been some successes in digital financial inclusion in African Borderlands. For example, M-Pesa, has been successful in Kenya and Tanzania, providing financial services to millions of people who previously had no access to formal financial services. Similarly, in Nigeria, the Central Bank launched the Nigerian Financial Inclusion Strategy, which aims to increase financial inclusion through digital channels.

Another example is the Zambezi Gateway project, a joint initiative between the governments of Zambia and Zimbabwe to develop a digital payment system that facilitates cross-border transactions in the Zambezi region. The project aims to increase financial inclusion in the borderland region by providing a platform for merchants and consumers to transact using mobile phones (World Bank, 2021).

Training and capacity building practices

Training and capacity building have been identified as effective strategies to enhance digital financial inclusion in borderlands (see Table 2). Capacity building is the process of developing and strengthening the knowledge, skills, abilities and resources of individuals, organizations and communities to improve their performance, productivity and effectiveness (Akintoye and Ashamu, 2018). Various types of capacity building have been employed in African borderlands, each with its strengths and weaknesses.

During the digital financial inclusion design workshop, several approaches were proposed to help individuals and organizations build the knowledge, skills and attitudes necessary to effectively use digital financial services. These include community-based initiatives, partnerships with non-governmental organizations and government-led initiatives.

Further, capacity building in digital financial inclusion in African borderlands can be categorized into two broad groups: formal and informal (Mwangi, 2017). Formal group include training programmes, workshops, seminars and certification programmes designed to provide individuals with the knowledge and skills necessary to use digital financial services effectively. Informal group, on the other hand, tend to involve community-based approaches that rely on peer-to-peer learning, mentorship and networking to enhance digital financial inclusion (Donou-Adonsou and Kiendrebeogo, 2020).

Training and education

Training and education efforts involve imparting knowledge and skills to individuals and organizations to enhance their capacity to use digital financial services. This often includes formal training sessions, workshops and seminars to educate individuals and institutions on how to use digital financial services effectively. For instance, in Kenya's borderlands, Equity Bank partnered with the United Nations Capital Development Fund (UNCDF) to provide training to women in rural border areas on the use of mobile banking. This training enhanced the women's ability to save, transact and access credit services using mobile phones.

However, training and education efforts may not be effective in promoting long-term behaviour change if they do not address other factors that affect access to and affordability of digital financial services. This is because individuals may not be able to use the services even if they have the necessary knowledge and skills due to other factors, such as poor network coverage and high transaction costs (Kimenyi and Ndung'u, 2019).

Partnerships and collaborations

Partnerships and collaborations can be conducted between digital financial service providers, governments and other stakeholders to enhance capacity building efforts. This often involves the sharing of resources, knowledge and expertise among partners to promote digital financial inclusion.

For example, in Tanzania's borderlands, the government partnered with mobile network operators and financial institutions to increase access to digital financial services in rural areas (Jeng and Hambira, 2019). Through this partnership, mobile network operators provided network coverage in rural areas, while financial institutions offered mobile banking services to customers.

Challenges that partnerships and collaborations may face are conflicting interests among partners, lack of trust among partners and inadequate resources to support capacity building efforts.

Community-led capacity-building initiatives

Community-led initiatives empower communities to lead their own capacity building efforts. This involves the identification of local leaders and community-based organizations to drive capacity-building initiatives. For example, in Uganda's borderlands, UNDP partnered with the Rural Initiative for Community Empowerment (RICE) to promote digital financial services in rural areas. Through this partnership, RICE trained local leaders to become digital financial service ambassadors, who then educated their communities on the matter.

Another example in Uganda is the Community Knowledge Worker (CKW) programme that trains community-based agents to provide digital financial services to rural farmers. The CKW programme successfully leverages the existing community structures to build capacity among rural communities, which increases the uptake of digital financial services (Kabeer and Ismayilova, 2017).

Community-led initiatives may face challenges, such as lack of resources and the possibility of excluding marginalized groups that do not have access to community networks (Osei-Bryson et al., 2018).

Financial literacy programmes

Financial literacy programmes have had successes in digital financial inclusion (Tarimo and Rutashobya, 2018). Financial literacy programmes improve the knowledge and skills of individuals on financial matters such as budgeting, savings and investments. These programmes train on the use of digital financial services and the benefits they offer. According to a representative of Equity Bank, "Capacity building de-risks customers as they continuously acquire knowledge that influences their attitudes and enables them to acquire skills and business practices."

In Tanzania, for example, a financial literacy programme called *Mifugo ni Mali* (meaning "livestock is wealth") targeting rural livestock keepers. The programme trained farmers in financial management, including the use of mobile money services to pay for inputs and receive payments for their livestock.

***Table 2*: Review of training programmes**

<table>
<tr><th>Types of training</th><th>Coverage and target beneficiaries</th><th>Effectiveness and impact</th></tr>
<tr><td>Digital banking and mobile money training. This type of training focuses on teaching individuals how to use mobile money services effectively, such as understanding how to create accounts, conduct transactions and manage funds via mobile devices.</td><td rowspan="3">Borderland communities. A significant portion of these programmes focuses on reaching remote rural areas, where access to traditional banking infrastructure is limited.

Youth and women. Many initiatives prioritize youth and women as beneficiaries to promote gender equality and empower the next generation with digital financial skills.

Smallholder farmers. Programmes in agricultural regions target smallholder farmers to improve their financial management and access to agricultural financing.

Informal cross-border traders. Borderland regions often have a substantial informal sector. Training programmes are tailored to the needs of traders and other informal workers.

Micro-entrepreneurs. Entrepreneurs, especially in the informal sector, are a key focus for programmes promoting e-commerce and digital financial tools.</td><td rowspan="3">Increased financial inclusion. Training programmes have significantly contributed to increased adoption of digital financial services, expanding access to banking for marginalized populations.

Improved financial literacy. Beneficiaries demonstrate improved financial literacy, enabling them to make more informed financial decisions and save money.

Enhanced income generation. Access to digital financial tools has facilitated income generation for small businesses and farmers, leading to economic growth in borderland regions.

Reduction in financial vulnerability. Digital financial literacy has helped communities better cope with financial shocks, such as medical emergencies and natural disasters.</td></tr>
<tr><td>Entrepreneurship and e-commerce training. This type of training offers foundational digital literacy training, including using smartphones, accessing the internet and utilizing basic financial apps.</td></tr>
<tr><td>Financial literacy training. This type of training combines digital literacy with financial education, teaching participants how to save, budget and invest using digital tools.</td></tr>
</table>

Alternative collateralization strategies

Cross-border trade is crucial for the growth and development of Africa's economies. However, accessing credit can be a significant challenge for traders operating in African borderlands. Collateral requirements and the high risks associated with cross-border trade (see below) are significant obstacles that limit access to finance for these traders. Limited access to formal banking services further affects their financial inclusion.

Collateralization refers to the provision of security or assets pledged by borrowers to lenders to secure a loan. As cross-border traders in African borderlands often lack formal property rights, their assets may not be accepted as collateral by formal financial institutions. As a result, alternative collateralization methods have emerged, such as community-based collateralization and social collateralization.

Alternative collateralization approaches, as described below, can provide some solutions. An example of such an approach is using movable assets, such as inventory, as collateral. This approach has been successful in Kenya, where traders use their stock as collateral for loans from micro-finance institutions (Kimenju and Decker, 2018).

Group collateralization

Group collateralization is when groups of traders or individuals come together to guarantee each other's loans. In this approach, the group members are jointly and severally liable for the loan, which means that they are all responsible for repayment. The group members act as guarantors for each other and if one member defaults, the others are responsible for repaying the loan.

This form of collateralization has been successful in many African borderlands, such as Maasai communities in Kenya, where traders use livestock as collateral for loans, and in Tanzania (Beck and Cull, 2014). In Kenya, the community established a livestock bank, where traders can borrow livestock and repay with interest. The livestock bank enables traders to access credit and expand their businesses, promoting financial inclusion in the community.

Social collateralization

> *"The informal sector is largely self-regulated, with strong internal control processes. They have created an incentive approach to trade among themselves and access credit among themselves, including individual-to-individual lending. They use social collateral, whereby members co-guarantee each other to access credit from community credit unions. The Africa Borderlands Centre could therefore define the value creation in using digital technology and support them to, for instance, access working capital and provide training (including digital literacy where relevant) before advancing credit."*
> ***-Tanda Ibrahim Bonkano, Directeur de la Promotion du Commerce des Services et du*** *Commerce Electronique, Niger. workshop participant*

Social collateralization involves the use of social networks, relationships and trust to provide collateral for loans. This method is common in many African communities, where social bonds are stronger than formal financial institutions' trust. Social collateralization relies on the reputation of the borrower and the lender's trust in the borrower's ability to repay the loan.

In the case of cross-border traders, social collateral may be particularly effective as they often operate within tight-knit communities and have established relationships with other traders, suppliers and customers. For example, in Nigeria, the Association of Nigerian Traders (ANT) has used social collateral to provide credit to its members, allowing them to purchase goods from other African countries (Alidou, 2019).

> *"The informal sector is largely self-regulated, with strong internal control processes. They have created an incentive approach to trade among themselves and access credit among themselves, including individual-to-individual lending. They use social collateral, whereby members co-guarantee each other to access credit from community credit unions. The Africa Borderlands Centre could therefore define the value creation in using digital technology and support them to, for instance, access working capital and provide training (including digital literacy where relevant) before advancing credit."*
> ***-Tanda Ibrahim Bonkano, Directeur de la Promotion du Commerce des Services et du*** *Commerce Electronique, Niger. Workshop Participant.*

Electronic records

Another alternative collateralization approach is the use of electronic records, such as mobile money transaction histories, to assess creditworthiness. This approach has been successful in countries like Uganda, where mobile network operators partner with microfinance institutions (MFIs) to provide credit to their customers based on their mobile money transaction history (Jack and Suri, 2014).

Alternative risk management approaches (including environmental, social and governance standards)

Risk management (see Table 3) likewise is crucial in cross-border trading, particularly in Africa borderlands, where traders face numerous risks, such as political instability, currency fluctuations and transportation risks. Effective risk management is important for increasing access to credit for cross-border traders. Traditional risk management tools, such as insurance and hedging, are not widely available in these regions.

Consequently, alternative risk management approaches have emerged, such as the use of mobile money and informal networks to increase access to credit. Credit scoring models are used that take into account factors such as transaction history, business performance and social networks. Approaches can also involve the use of credit guarantees and insurance or risk-sharing schemes to reduce the risk of default.

Credit guarantees

Credit guarantees involve a third party, such as a government or a development agency, providing a guarantee for the loan. This approach reduces the lender's risk and increases the chances of approval for the borrower.

In Ghana, the government has implemented the Export Development and Agricultural Investment Fund (EDAIF), which provides credit guarantees to exporters and traders. In Tanzania, the Small Industries Development Organization (SIDO) has partnered with the African Guarantee Fund to provide guarantees to lenders, reducing the risk of default and increasing access to credit for small businesses, including cross-border traders (Bankole, 2017).

Information sharing

Information sharing involves sharing data on cross-border trade, including market information and credit histories. This approach helps lenders assess the risks and opportunities associated with cross-border trade and make informed decisions. In East Africa, the East African Community has implemented the Regional Payment and Settlement System (REPSS), which allows for the exchange of information on cross-border trade and payment systems.

Social collateral

Another risk management approach is to use social collateral, through which groups of traders guarantee each other's loans. Social collateral has been successful in countries like Tanzania, where groups of traders form village community banks to provide each other with credit and guarantee each other's loans (Beck and Cull, 2014).

***Table 3*: Risk management strategies for cross border traders**

Risk item	Risk description and objective	Mitigation measures
Currency risk management	This is the risk that fluctuating exchange rates will negatively impact the value of assets, liabilities or cash flows for cross-border traders. **Objective:** Mitigate the impact of currency fluctuations on financial transactions.	**Hedging**: Utilize financial instruments, such as forward contracts to lock in exchange rates, protecting against adverse currency movements. **Multi-currency accounts**: Maintain accounts in multiple currencies to facilitate transactions and reduce conversion costs. **Regular forecasting**: Continuously monitor and forecast exchange rate movements to make informed decisions.
Supply chain diversification	The practice of spreading sourcing and production across multiple suppliers, regions or countries.	**Supplier selection**: Work with suppliers from different regions or countries to spread risk.
	Objective: To reduce vulnerability to supply chain disruptions.	**Safety stock**: Maintain safety stock or buffer inventory to mitigate disruptions. **Alternative routes**: Identify alternative shipping routes and modes of transportation to ensure timely deliveries.

Legal and regulatory compliance	Legal and regulatory compliance involves adhering to the laws, rules and regulations of the countries in which cross-border traders operate. **Objective**: To navigate complex international legal and regulatory environments.	**Stay informed:** Stay updated on changing regulations and ensure all business practices align with legal requirements. **Document everything:** Keep thorough records of all transactions and compliance efforts.

Bookkeeping and cashflow management

Bookkeeping is the process of recording financial transactions in a systematic and organized way (Mlenga and Masangwi, 2020). It involves keeping track of income and expenses, receipts, invoices and other financial documents. Good bookkeeping practices help traders to monitor their financial performance, identify areas of strength and weakness and make informed decisions about their business operations. For cross-border traders operating in African borderlands, bookkeeping is essential for tracking payments and managing foreign exchange transactions.

Cash flow management is the process of monitoring and managing the flow of cash into and out of a business. Effective cash flow management helps traders to maintain liquidity, pay bills on time and manage unexpected expenses. In the context of cross-border trading in African borderlands, cash flow management is critical for managing currency fluctuations, reducing transaction costs and mitigating risks associated with cross-border trade.

Importance of training in bookkeeping and cashflow management

> *“In Rwanda, MVEND has developed a solution for the community credit unions, digitization has helped individual members to make savings on their mobile wallets that are linked to the group wallet, eliminating manual record-keeping, thereby enhancing transparency and saving time. This has improved records accuracy, making it easier to manage the funds.”*
> ***- Bobson Rugambwa,** Chief Executive Officer, Mvend, and workshop participant*

Informal traders in Zambia who operate in the border area of Livingstone-Victoria Falls face numerous challenges in managing their finances. Many of these traders lack access to formal financial services, such as bank accounts or credit, and rely on cash transactions. This makes it difficult for them to keep track of their income and expenses and manage their cash flow effectively. However, a study by the International Labour Organization (ILO) found that providing training in bookkeeping and cash flow management to informal traders in Zambia had a positive impact on their financial management practices and increased their access to credit (ILO, 2016).

“In Rwanda, MVEND has developed a solution for the community credit unions, digitization has helped individual members to make savings on their mobile wallets that are linked to the group wallet, eliminating manual record-keeping, thereby enhancing transparency and saving time. This has improved records accuracy, making it easier to manage the funds.”
- Bobson Rugambwa, Mvend, Chief Executive Officer, workshop participant

How digitization can assist with accuracy, transparency and security

Digitization can address some of the challenges related to loan disbursements. For example, it has been suggested that sometimes those obtaining loans were favoured or officials of groups used funds without following the established procedures. With a digital interface, every group member can see the amount of money in the group, how much has been disbursed and to who. The process also helps the groups keep track of the interest earned by the groups, encouraging members to save more.

Digitization eliminates the security risk of putting money in a cash box and transporting it to banks, as it is possible to pull and disburse funds electronically. This also saves time, increases management's transparency and keeps track of payments.

Digitization and credit scores

Digitalization makes it possible to convert social credit scores to data-backed credit scores when user behaviour is captured digitally and augmented by social data to improve credit scores. However, in the context of CCUs, social credit scores are more accurate than digital scores as people in the community know when other members are in crisis, whereas digital scores don't take this into account. The solution should therefore define a way through which social scores can be transferred into a language that is understandable to financial institutions.

Targeting the most vulnerable sustainably

Sustainability is a critical factor for a healthy digital financial inclusion landscape in Africa's border areas. To be sustainable, fintech companies in these areas must not only focus on profitability but also on social impact. Their business models should not only address the financial needs of underserved communities but must also contribute to the economic growth and development of the communities they serve. This can be achieved by providing affordable and accessible financial services that enable individuals (particularly women and youth since they form the biggest part of the population) and small businesses to build financial resilience and security.

By offering financial services to the unbanked population, fintech companies like Branch, Tala and Pagaare not just opening up financial inclusion but are also promoting economic growth, improving livelihoods and reducing poverty in borderland areas. Fintech companies must also take sustainability into account through responsible lending.

SECTION 4:
MODEL FOR DIGITAL FINANCIAL INCLUSION IN AFRICA'S BORDERLANDS

The co-creation design workshop identified a model, composed of five main methods, for wider and sustainable digital financial inclusion in Africa's borderlands. The model intends to address challenges of poverty and vulnerability in marginalized communities across African borderlands through the leveraging of technology and digital solutions to enhance financial inclusion. The larger aim is to promote socio-economic development in these regions, with an emphasis on economic activities that emphasize green growth and climate resilience.

The DFI model specifically focuses on strengthening the capacity of community credit unions in digitization and the provision of integrated virtual services to empower borderland businesses and populations, including the most vulnerable individuals.

By promoting financial inclusion through digital solutions, the model aims to help overcome limitations faced by CCUs and other trusted institutions in providing accessible capital to borderland businesses and individuals. This, in turn, is hoped to have a catalytic impact on the overall development of the borderlands, facilitating inclusive growth and reducing poverty.

Furthermore, by scaling digitization efforts and mitigating risks, the model hopes to attract technology solution providers and expand the market for financial services in borderlands, ultimately bringing about even more inclusive and accelerated development.

UNDP's Africa Borderlands Centre contends that investment in informal cross-border trade linked to farming and pastoralism is a viable development pathway for borderland regions. However, a lack of digital tools and infrastructure and limited access to financial support has hindered the competitiveness and ability of CCUs to support borderland businesses and individuals effectively. The DFI model addresses these challenges by promoting the digitization of CCUs, enabling them to offer integrated virtual services that facilitate credit, improve the savings culture, offer cashless payment solutions and increase the ease of cross-border transactions.

The cornerstone of this model is a web application to be developed through a partnership between CCUs and existing technology providers. The design of the web application will be informed by rigorous risk and vulnerability assessments, customer experience tracking and a deep understanding of the application's programming interface (API) ecosystem. Additionally, the model will provide institutional capacity support, tailored training programmes and enable cross-border transactions, all of which will enhance financial accessibility, reliable financial solutions and promote economic activities.

The proposed model encompasses the five key components below.

1. **Web application development**. Collaborate with existing technology providers and CCUs to adapt an existing technology-enabled financing tool, such as a web application. This tool should be accessible and reliable, designed to meet the financial needs of the most vulnerable in the borderlands. It should provide an integrated solution to credit and savings challenges while optimizing cashless payment options. The design of the tool should consider risk and vulnerability assessments, customer experience tracking and be based on a thorough understanding of the application programming interface (API) ecosystem.

2. **Technical support and capacity building**. UNDP's Africa Borderlands Centre and its partners will provide technical support to collaborating entities. Support would include setting minimum standards and criteria for credit facilitation, assisting with customer acquisition, guiding technology integration and product iteration and offering tailored entrepreneurship capacity development. Collaborating organizations will also receive assistance in enhancing their capacity for beneficiary record management, data analytics, reporting and customer management. Such support will reinforce long-term ownership and sustainability of the model.

3. **Grant-to-credit scheme**. A grant-to-credit scheme will be implemented for competitively selected consortiums to deploy revolving loans for vulnerable individuals in specific value-chains. The grants will serve as a catalytic fund to kickstart the credit scheme. The selected consortiums will provide revolving loans that cater to the financial needs of the vulnerable population. The credit facility should prioritize economic activities that promote green growth and climate resilience.

4. **Training and capacity development**. A tailored capacity development approach will be undertaken linked to specific product pipelines in the various borderland communities. This training will be delivered through both online platforms and peer-to-peer learning. The training modules will be integrated into the web application for easy access. Training will cover digital literacy, financial education, entrepreneurship, marketing and business development. Evidence of capacity development should be considered part of credit scoring and beneficiary eligibility criteria. Training will be provided to product managers and beneficiaries, focusing on sustainable management of

the project infrastructure beyond the support period. Analytics and learning activities will be provided to policy influencers to demonstrate the impact generated and allow for scaling up of activities.

5. **Cross-border transaction integration**. The various borderland area's digital financial inclusion products will be linked to major digital payment gateway service providers in Africa. This integration will overcome challenges related to currency fluctuations, facilitate cross-border trade, promote cashless payments and improve security, especially for female traders. Connections will be established between the digital financial inclusion products supported and the numerous payment solution providers, banks, financial institutions, telecoms-based payment solutions and agent bankers across African countries. This network will enable seamless payments and enhance accessibility for users.

By combining these five components, the digital financial inclusion model lays the foundation for a more inclusive and sustainable financial system in the borderlands. It is an innovative and holistic approach that leverages technology, partnerships, capacity development and cross-border connectivity to empower and uplift the most vulnerable members of society. Through implementation of this model, stakeholders can strive towards a more equitable and prosperous future in Africa's borderland communities, while respecting the concept of Leaving No One Behind.

***Table 4*: Evaluation of the five components of the digital financial inclusion model**

Methods	Implementation	Risks	Impacts
Web application development	Collaborating with existing technology providers and CCUs to adapt a web application is a practical approach. It leverages existing resources and partnerships.	Risks may include technical challenges during development, cybersecurity threats and ensuring the accessibility and usability of the application for the target audience.	Developing a user-friendly web application that addresses financial needs and optimizes cashless payments can have a significant positive impact on financial inclusion, especially if it is well-designed and responsive to user feedback.
Technical support and capacity building	Providing technical support and capacity building to collaborating entities is crucial for long-term success. It promotes sustainability and fosters ownership.	Risks include the need for ongoing support, ensuring that capacity building aligns with the specific needs of CCUs and maintaining the quality of support.	Enhancing the capacity of organizations involved in financial inclusion can lead to better services and outcomes for vulnerable populations. It can also promote the sustainability of the initiative.
Grant-to-credit schemes	Implementing a grant-to-credit scheme can kickstart credit availability.	Careful selection of consortiums and monitoring is vital. Risks include misallocation of funds, sustainability of the credit scheme after	Providing access to credit for vulnerable individuals can empower them economically and contribute to green growth, potentially

		the initial grant and ensuring that the loans align with green growth and climate resilience goals.	reducing poverty and vulnerability.
Technical support and capacity building	Tailoring capacity building approaches and integrating training modules into the web application is a proactive approach.	Risks may include the effectiveness of online training, ensuring beneficiary engagement and the challenge of sustaining capacity beyond the support period.	Proper training can equip beneficiaries and product managers with skills necessary for sustainable management and growth. It can also improve the overall impact of the initiative.

REFERENCES

Aiyar, et al. (2020). "Adoption Factors of FinTech: Evidence from an Emerging Economy Country-Wide Representative Sample." University of Delhi.

Akintoye, I. R., and Ashamu, S. O. (2018). "Digital financial inclusion: Exploring the challenges and opportunities in Africa." *Journal of Internet Banking and Commerce*, 23(2), 1-16.

Alidou, O. (2019). "The Role of Social Collateral in Cross-border Trade: Evidence from Benin-Nigeria Border." *Journal of International Development*, 31(2), 91-109.

Alliance of for Financial Inclusion (2021). "Policy Framework on the Regulation, Licensing and Supervision of Digital Banks."

Baker, et al. (2021). *Agri DFS: Emerging business models to support the financial inclusion of smallholder farmers.* London.

Beck, T., & and Cull, R. (2014). "SME Finance in Africa," *Journal of African Economies*, 23, 583-613. doi:https://doi.org/10.1093/jae/eju016.

Baonkole, D. (2017). "Impact of SIDO NEDF Microfinance Loan on Small and Medium Enterprises (SMEs): The Survey of Selected SMEs in Dar-es-salaam." Dar-es-salaam.

Beck, T., and Cull, R. (2014). "Banking in Africa: Are there lessons to be learned from experience?" *Journal of African Economies*, 23(5), 583–613. doi: 10.1093/jae/eju009.

Carayannis, E. (2018, October). "The ecosystem as helix: An exploratory theory-building study of regional co-opetitive entrepreneurial ecosystems as Quadruple/Quintuple Helix Innovation Models: The ecosystem as helix."

Central Bank of Nigeria (2021). "Guidelines for the regulations and supervision of microfinance in Nigeria." Abuja.

Chirisa, I., and Nhundu, K. (2018). "Mobile money regulation and financial inclusion in Zimbabwe: challenges and prospects." *Journal of Poverty, Investment and Development*, 41, 65-78.

Demirguc-Kunt, A., Klapper, L., Singer, D., Ansar, S., and Hess, J. (2018). "The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution." World Bank Policy Research Working Paper, (8440).

Donou-Adonsou, F., and Kiendrebeogo, Y. (2020). "Enhancing financial inclusion through digital innovation: Evidence from Africa." *Journal of African Business*, 21(4), 501-521.

Global System for Mobile Communications Association (GSMA). (2020). "State of the industry report on mobile money." Retrieved from www.gsma.com/mobilefordevelopment/resources/state-of-the-industry-report-on-mobile-money-2020/.

International Financial Corporation (2017). "The Future of Financial Inclusion in Africa." Johannesburg.

Jack, W., and Suri, T. (2014). "Risk sharing and transactions costs: Evidence from Kenya's mobile money revolution." *American Economic Review*, 104(1), 183-223.

Jeng, M., and Hambira, W. L. (2019). "Digital financial inclusion for smallholder farmers in Africa: Opportunities and challenges." *Journal of Agribusiness in Developing and Emerging Economies*, 9(2), 168-181.

Kabeer, N., and Ismayilova, L. (2017). Community-driven development in practice: innovations from the field. Routledge.

Kimenju, M. and Decker, B. (2018). *Microfinance Institutions and Public Policy.* International Monetary Fund.

Kimenyi, M. S., and Ndung'u, N. S. (2019). Digital financial inclusion in Africa: Progress and challenges. Brookings Institution Press.

Klynveld Peat Marwick Goerdeler (KPMG). (2016). "Expertise and innovation to drive success." Annual Review, 2016.

Mas, I., and Radcliffe, D. (2010). "Mobile payments go viral: M-PESA in Kenya." Innovations: Technology, Governance, Globalization, 5(2), 115-126.

Mlenga, F., and Masangwi, J. (2020). "Bookkeeping and financial management practices of informal traders in Malawi: A case of Ndirande Market." *Journal of Economics and Behavioral Studies*, 12(2), 128-141.

Mwangi (2017). "Livelihoods, Resilience and Migration in the context of slow onset of climate change in the Africa Borderlands."

OECD (2020). "Advancing the Digital Financial Inclusion of Youth." www.oecd.org/daf/fin/financial-education/advancing-the-digital-financial-inclusion-of-youth.htm.

Ogunleye, O. S., and Ayorinde, T. O. (2019). Community-Based Financial Cooperatives and Financial Inclusion.

Okeke-Uzodike, U., and Okeke-Uzodike, C. (2019). "Innovation in Africa: Trends, Challenges and Opportunities." *Journal of African Business*, 20(1), 1-14. doi: 10.1080/15228916.2018.1567469.

Organisation for Economic Co-operation and Development (OECD) (2020). "Advancing the Digital Financial Inclusion of Youth." www.oecd.org/daf/fin/financial-education/advancing-the-digital-financial-inclusion-of-youth.htm.

Osei-Bryson, K. M., Ngwenyama, O., and Watson, R. T. (2018). "Digital financial services adoption in sub-Saharan Africa: Beyond the technological factor." *Journal of the Association for Information Systems*, 19(11), 120.

Ouma, S. A., Odongo, T. M., and Were, M. (2018). "The impact of regulatory frameworks on the growth of mobile money services in Africa: An exploratory study." *International Journal of Information Management*, 38(1), 45-52.

Tarimo, C. S., and Rutashobya, L. K. (2018). "Financial literacy and adoption of digital financial services in rural Tanzania: Evidence from Mifugo ni Mali program." *International Journal of Economics, Commerce and Managemen*t, 6(10), 38-51.

Tsoho, B. U., Iyortsuun, A., and Adebayo, A. (2018). "The Role of Community Cooperative Unions in Promoting Financial Inclusion in Nigeria." *Journal of Economics and Sustainable Development*, 9(3), 28-34.

World Bank. (2021). "Nigeria." Retrieved from https://data.worldbank.org/country/nigeria.

Zeller, M, & and Sharma, M. (2014). "Rural Finance and Poverty Alleviation: Food Policy Report." Washington, D.C..: International Food Policy Research Institute.


Africa Borderlands Centre
UNDP