



THE GLOBAL
MECHANISM
United Nations Convention
to Combat Desertification



In partnership with

Canada

FINANCIAL AND DIGITAL
INCLUSION FOR LAST MILE PAYMENTS

TRENDS, SUSTAINABLE LAND USE AND DISRUPTIVE FINANCIAL SERVICE OPTIONS





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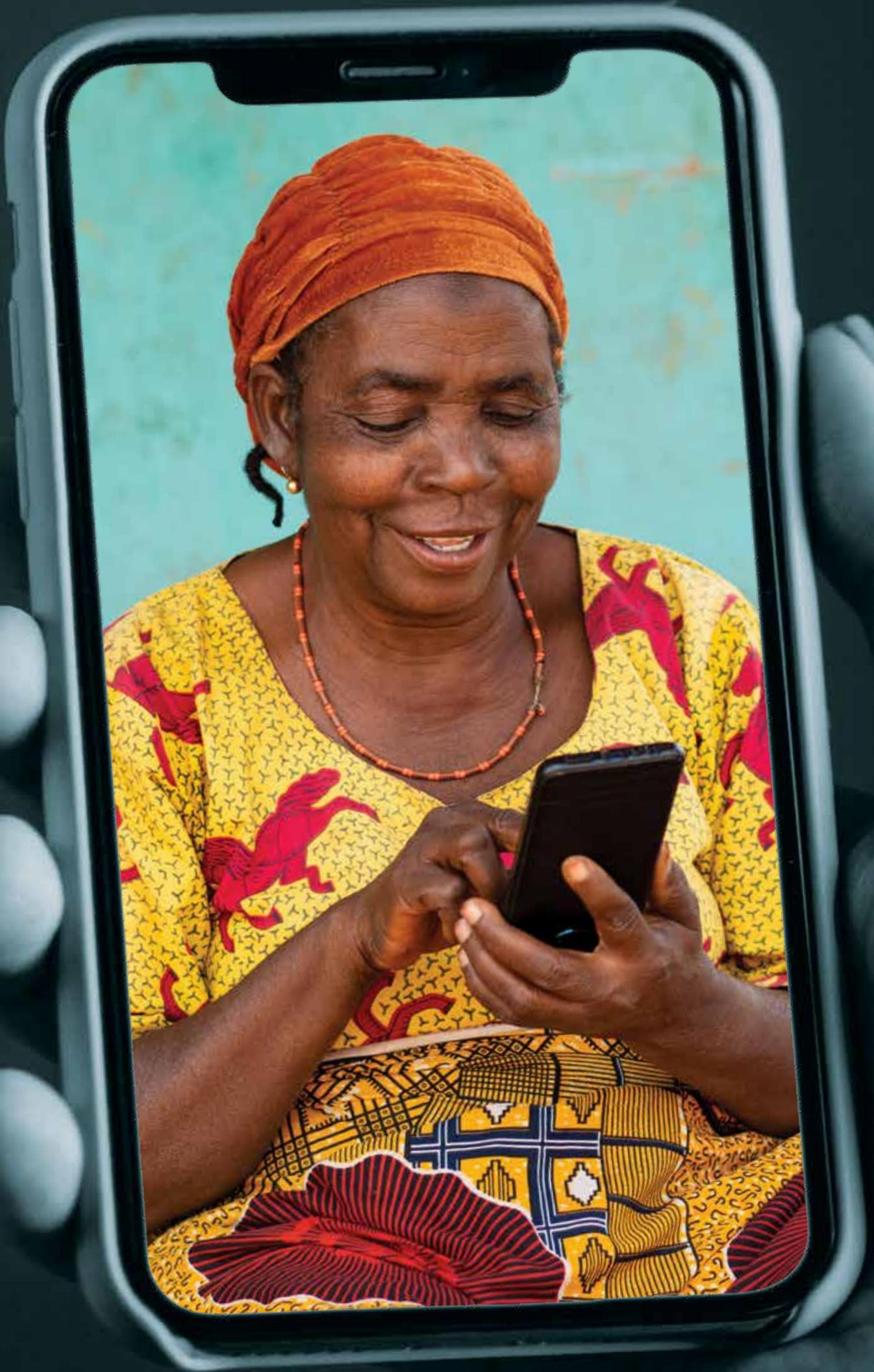


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EXECUTIVE SUMMARY



As the world addresses the necessary realignment in investment strategies to tackle a range of existential issues including climate change, land degradation, polluted oceans and gender inequality; new ways to securely transfer funds and boost digital & financial inclusion are emerging. A high volume of transactions into more hard-to-reach areas are taking place along non-traditional payment corridors, especially where financial infrastructure is limited or does not exist.

Digital identities, mobile wallets, distributed ledger technology, remote Digital, Monitoring Reporting & Verification (DRMV) techniques as well as advancements in mobile network coverage are presenting new opportunities for rural communities and women to participate financially in the green transition. A range of secure ways to pay recipients government subsidies or aid is also an opportunity for organizations to augment and target their impact on the ground.

Governments and global institutions have an important role to play in providing favourable regulatory conditions and in supporting infrastructure for digital solutions, to enable mass adoption and financial inclusion. There has been significant progress and learnings from the private and public sectors on the Indian Subcontinent that have embraced the opportunity afforded by digital identities and mobile wallet technology. This has also provided a platform for start-ups to focus on financially disenfranchised groups, such as, rural communities and women.

As for purpose companies, tech for good, non-profits and NGOs look to create longer term sustainable development, leveraging advances in disruptive fintech and digital infrastructure is key. As the cost of these technologies fall, the greater the opportunity becomes to make a significant environmental and social impact in LMICs.

In this report we will examine a range of interconnecting elements that make up financial inclusion and last mile payments and will provide the reader with tangible examples that can be deployed in remote areas to empower underserved groups such as young people and women.





SECTOR TRENDS



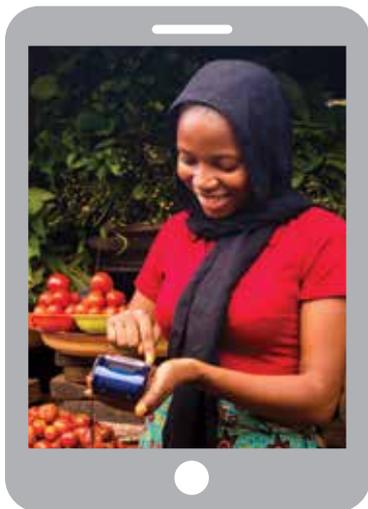
Close to one-third of adults – 1.7 billion – were still unbanked in 2017, according to the latest Findex data (2021 data forthcoming). About half of unbanked people included women and poor households in rural areas or out of the workforce.¹

Financial inclusion is critical in the context of secure funds distribution for donors and NGOs in particular to remote rural areas at the forefront of climate action. It is also an enabler of eight of the seventeen goals the Sustainable Development Goals.

Namely; SDG1, on eradicating poverty; SDG 2 on ending hunger, achieving food security and promoting sustainable agriculture; SDG 3 on profiting health and well-being; SDG 5 on achieving gender equality and economic empowerment of women; SDG 8 on promoting economic growth and jobs; SDG 9 on supporting industry, innovation, and infrastructure; and SDG 10 on reducing inequality. Additionally, in SDG 17 on strengthening the means of implementation there is an implicit role for greater financial inclusion through greater savings mobilisation for investment.

¹ The Global Findex Database 2021, World Bank.

More generally, over the past decade, mobile money has moved millions of households in low and middle income countries (LMICs) from the informal cash economy into a more inclusive digital economy. In 2012, there were 169 mobile money deployments in 71 countries. Ten years on, the number of live deployments has almost doubled to 316 and expanded to 98 countries worldwide.² Across LMICs, people are living increasingly digital lives thanks to mobile money, transacting more often and for more reasons than ever before. The COVID-19 pandemic accelerated this shift as people turned to digital, no-contact ways to purchase everyday items, pay bills, receive government support payments and send money home to family. In 2021, this continued growth helped push the value of transactions to the trillion-dollar mark – a milestone reached faster than anyone in the industry could have predicted.



Financial products such as savings, credit, insurance, payments, and remittances are becoming more widely available to individuals notably the excluded including women, the young and the underbanked. Micro, small, and medium enterprises also are beginning to access capital at more reasonable costs, however inflationary pressures and higher interest rates will have an adverse effect on this trend, at least the short term.

Between 2011 and 2017 gender gap in account ownership remained stuck at 9 percentage points in developing countries, hindering women from being able to effectively control their financial lives. Countries with high mobile money account ownership had less gender inequality. The impact of the COVID-19 on this gender gap remains to be seen.

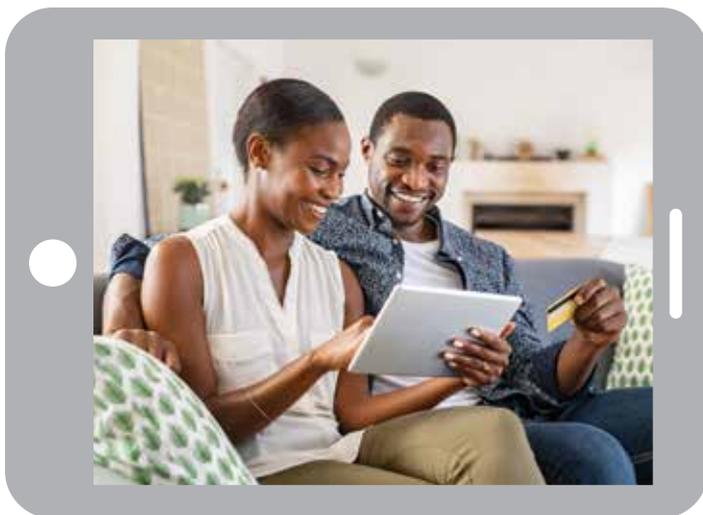
For example; gender equality remains one of the main outstanding tasks in Latin America and the Caribbean. The work fronts are broad and complex, ranging from ensuring women's physical safety to promoting more equal participation in the economy, guaranteeing their rights and fostering their financial autonomy and ability to make decisions autonomously.

The management of household finances is one of the key issues on the path to gender equality. According to a new Development Bank of Latin America (CAF) report, women currently make fewer financial decisions than men in Latin American households. After analysing the cases of Brazil, Colombia, Ecuador and Peru, the research shows that, in the households of the four countries analysed, 33% of women make financial decisions on their own, compared to 48% of men.³

There's growing evidence that access to savings leads to positive economic outcomes for women, including increasing productivity and profits and greater investment in their businesses. Having savings also makes women less likely to sell assets to address health emergencies, stabilizes their incomes in times of economic shocks, and provides greater control over their funds. There are also a growing number of fintechs that are promoting financial literacy and developing financial services targeted at women, who in many regions have traditionally been responsible for household finances.

² GSMA State of the Industry Report on Mobile Money 2022.

³ There is no Gender Equality without Financial Inclusion, CAF, Development Bank of Latin America 2022.



Since 2010, more than 55 countries have made commitments to financial inclusion, and more than 60 have either launched or are developing a national strategy. Countries that have achieved the most progress toward financial inclusion have delivered policies at scale, such as universal digital ID schemes in India.

Digital inclusion, incorporates a number of areas including digital IDs, affordable mobile handsets, feature phone enhancements, mobile network coverage and

access to power to charge the requisite equipment. Remote rural areas have traditionally been marginalised in terms of connectivity due the fact that it is expensive and hard to maintain meaning low or negative Return on Investment (ROI). New technologies and renewable energies are lowering these costs meaning private sector companies are beginning to enter this space which will be a significant enabler in delivering financial inclusion.

One of the main barriers to digital inclusion is that roughly 1 billion people lack an official foundational identification. These 1 billion people are unable to prove their identity (ID), and millions more have forms of identification that cannot be reliably verified or authenticated, resulting in exclusion from economic opportunities and financial services. A reliable ID is integral to providing and obtaining financial services.

One major success story is the Indian Government's launch in 2009 of Aadhaar, a biometrically verifiable identification number for each individual. Today, 1.2 billion Indians including over 99% of the adult population are enrolled. In 2013, the government launched another program DBT (Direct Benefit Transfer) which enables millions of Indian citizens to receive state benefits more quickly.⁴ This level of individualised financial inclusion also lends itself to gender empowerment as women are paid directly to their mobile, reducing the potential for loss of income associated with cash payments.

In Brazil too, the government and central bank have taken measures to drive digital inclusion such as Program North Connected and the launch of PIX in 2020. PIX makes it possible to transfer money between consumers and companies in up to 10 seconds, 24 hours a day, seven days a week. Like India this has fostered a fintech boom with over 330 financial start-ups operating in 2022 according to Radar FinTech Lab. Quarantine during the pandemic has further boosted e-commerce and the use of new technologies by Brazilian consumers. Payments using tap and real-time payments using PIX are now mainstream along with digital banking.

⁴ Capco, Financial Inclusion Evolution and the Digital Push 2022.



Last mile payment solutions and financing models promoted by bodies like the UNCDF; support banks, cooperatives, microfinance institutions, money transfer companies and mobile network operators to extend the reach of financial markets where they would otherwise not go.

In terms of last mile payments for NGOs many of the market solutions are emerging from the need for businesses to have greater control of their expenses and to lower

the cost cross border transactions within the global economic system. The rapid increase in multibank foreign exchange (FX) networks, fintechs and neobanks have driven down the cost of remitting funds cross border however trading in exotic currencies from LMICs still carries a significant premium due to FX exposure and fluctuation risk.

Downward pressure on the cost of cross border payments will also be accelerated by initiatives such as the Pan-African Payment and Settlement System (PAPSS) which aims to emulate the success of Single Euro Payments Area (SEPA) in the European Union. This cross-border, financial market infrastructure is streamlining payment transactions across Africa which is encouraging intercontinental trade particularly after the establishment of the African Continental Free Trade Area (AfCFTA) in 2018.

Furthermore, last mile micro payments and voucher solutions providers for subsidies, state benefits or international aid are emerging. Employing technology including blockchain, SIM card adaption techniques and sub wallet capabilities these actors are delivering targeted, secure and low-cost disbursements ideal for rural communities and to close the gender gap. With many climate action initiatives tackling land degradation and desertification being undertaken

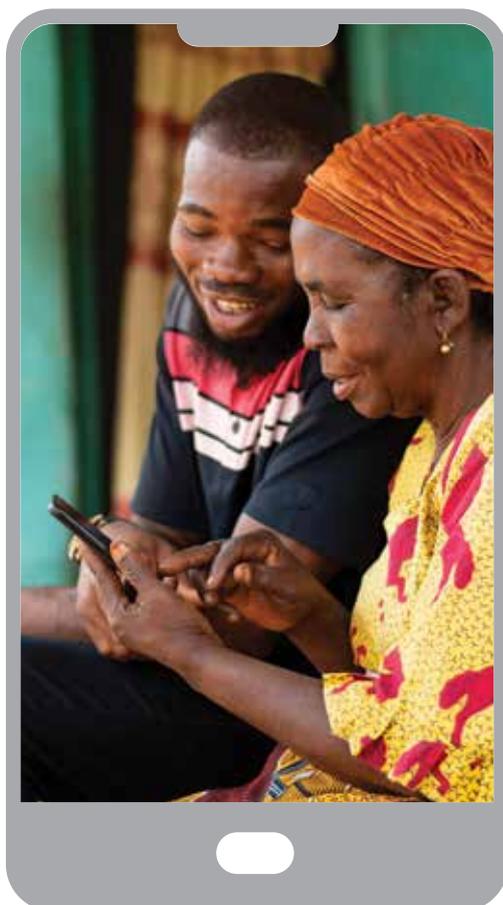


in remote areas, technology is needed to ensure financial support can be delivered and importantly that small holders gain access to global markets for sustainable development. This more targeted approach to last mile is also tackling leakage in aid and also becoming more prescriptive in terms how funds can be spent. Replacing cash with digital payments reduces corruption and criminality, while giving women more security and greater control over their own finances.

After Covid 19 and Cop 26 in Glasgow the topic of **Climate Finance** has come to the forefront of discussions and has led to disruption in the carbon credits markets and has encouraged new ways for companies and individuals to contribute to climate action projects. A number of tech companies have emerged that leverage blockchain to tokenize carbon credits, using the immutability of distributed ledger technology to provide more trust and transparency for consumers and corporate buyers. Two areas which are critical to the success of climate action projects are ensure the majority of funds generated are received by carbon project developers and importantly demand a high level of social impact associated with projects supporting sustainable development, gender empowerment and land regeneration.

Other participants have entered the market providing ratings of carbon projects or offering insurance to cover delivery risk of carbon credit futures. These entrants it's hoped will help create the conditions to accelerate prefunding of climate action and increase liquidity in the carbon markets which is a concern.

The different types of carbon credits have diversified which will help on the supply side, as the demand from corporates continues to grow. Regenerative agricultural and land restoration is becoming a major part of global carbon sequestration. Monitoring, Reporting and Verification of carbon projects through satellite imagery, Lidar and IoT is becoming more widespread, cheaper and lends itself to the use of blockchain as a source of truth. Recognizing this, a number of blockchain providers have launched sustainability impact funds, providing grants to early adopters that create open-source methodologies to support the scalability of carbon markets.



Crowdfunding also represents a new alternative funding source for climate mitigation projects. Environmental and sustainable entrepreneurs often experience problems gaining finance for their ventures from traditional sources. Climate change mitigation technologies might be higher risk and more costly to develop. Additionally, the need to balance economic and environmental goals adds ambiguity that can make projects less attractive for traditional investors than pure for-profit projects, especially in the early funding phases.

It is therefore crucial to explore alternative financing schemes for sustainable entrepreneurs including the environmental ones. Through this mechanism obtaining funding from a potentially large pool of interested backers, where each backer provides a relatively small amount of money, without standard financial intermediaries has major benefits. In addition to securing funding, crowdfunding provides increased exposure for a product and company "word of mouth" buzz and increased public support and legitimacy to social impact and climate action start-ups.





FINANCIAL INCLUSION



Financial inclusion incorporates a wide range of considerations however generally speaking it means that individuals and businesses have access to useful and affordable financial products and services that meet their needs. Key elements include; transactions, payments, savings, credit and insurance, that's delivered in a responsible and sustainable way.

The G20 has committed to advance financial inclusion worldwide and reaffirmed its commitment to

implement the G20 High-Level Principles for Digital Financial Inclusion. The World Bank Group considers financial inclusion a key enabler to reduce extreme poverty and boost shared prosperity.

Financial inclusion supports overall economic growth and the achievement of broader development goals. Back in 2016 the McKinsey Global Institute estimated that digital finance alone would benefit billions of people by spurring inclusive growth that added \$3.7 trillion to the GDP of emerging economies.⁵ For example, it was found that the mobile money service in Kenya, M-PESA had already lifted as many as 194,000 households, around 2% of the Kenyan population, out of poverty and has been effective in improving the economic lives of poor women and of members of female-headed households.

⁵ Digital Finance for All, Powering Inclusive Growth in Emerging Economies, McKinsey & Company 2016.

It's also since been recognized that broader financial inclusion creates more stable financial systems and economies, mobilizing domestic resources through national savings and helping to boost government revenue, reducing the prevalence of the informal economy.

Mobile phones help expand financial services – especially for people living in rural areas poorly served by traditional banks. In sub-Saharan Africa, 12% of adults make phone-based payments, mostly through mobile money accounts, a number that reaches 55% in Kenya.⁶

In the 2020s companies such as MFS Africa have played a critical role in increasing financial inclusion further and enabling digitised cross-border payments in Africa, while they alone account for around 400 million mobile wallets on the continent. These solutions empower African households, rural populations, and marginalised communities through transfers of any digital store of value into mobile money wallets and bank accounts. MFS Africa has disrupted the payment industry by delivering interoperability that connects major mobile networks, banks, and non-banking financial institutions, including MTN Mobile Money, Airtel Money, M-PESA, Ecocash, Orange Money. Ultimately this enables the routing of transactions to and from mobile wallets and bank accounts across the continent.

Q CASE STUDY

MFS Africa: Helping small-scale farmers get paid more

Project Scope: Agricultural organization TruTrade and MFS Africa have worked together to ensure that smallholder farmers in Kenya and Uganda get their deserved share of the value of their produce.

- Integration of TruTrade platform with MFS mobile wallet technology
- Enabling direct digital payments to the field, quicker, more secure and fairer
- Developed customized features to support adoption and growth among small-scale farmers

Over the course of seven years the program added 13 franchises on the platform, while serving an average of 114 farmers per month.

Replacing cash payments from the main office to our franchise agents in the field meant funds were more secure and farmers less concerned with personal safety and fraud issues.

The platform has enabled TruTrade to pay multiple currencies instantly to their members on one platform. MFS Africa can transfer money across a different number of money mobile wallets across networks while recording every single transaction, for reconciliation purposes.

MFS Africa has recently enhanced its financial inclusion capabilities through the recent acquisition of the U.S. headquartered, Global Technology Partners, that has also provided secure instant payments to rural communities including a prepaid wallet solution in Zambia for farmers to receive government subsidiaries.

⁶ Financial inclusion has a big role to play in reaching the SDGs, World Bank 2016.

India is one of the major success stories in driving financial inclusion through government intervention and private sector innovation. India has made great progress in improving financial inclusion by making loans and other financial services available to low-income borrowers, through support from the Government of India, microfinance institutions (MFIs), and NGOs. In 2014 the government launched Pradhan Mantri Jan-Dhan Yojana, a program aimed at providing a bank account for every household. The program generated a record 443 million accounts for India's households since its August 2014 launch through to early January 2022.⁷

Women are particularly responsive to financial literacy outreach. Traditionally they manage the household budget and are often eager to start home-based businesses. When armed with foundational knowledge, financial literacy tools, and small-scale business opportunities, women entrepreneurs can make a remarkable impact on their families and communities. One fintech aiming to accelerate this positive trend of financial gender empowerment in India is SALT founded by Aditi Sholapurkar, Chaitra Chidan and Shinijni Kumar.

Q CASE STUDY

SALT (mysaltapp): Women and money in emerging markets

Project Scope: To develop a fintech platform offering products to bridge the gender finance gap in emerging markets.

- Conducted sophisticated psychometric assessments called the Money Personality Test
- Used data and contextualization to create a map for product building
- Built intuitive app to amplify financial network effects amongst communities of women

Research confirmed that women have managed their own and their household finances for decades. They make and optimize financial decisions all the time. But fall short of creating capital for themselves. It has been a role played by men, not always effectively. But when they find the opportunity, women are high-intent users, ready to take charge. It was also found through the research that when women do invest, they make better decisions and earn better returns.

The existing financial services system and its eligibility criteria are designed with men in mind. This is why credit card companies have decisioning algorithms that favour stable monthly salaries over the ebbs and flows of freelance income (statistically more prevalent among women) for example. The SALT platform therefore is designed to tackle the service supply side issue to find and curate products that work for women.

The core of the SALT-mysaltapp platform is the Passbook, a Natural Language Processing (NLP) based budgeting tool that reflects the money life of the consumer and makes it possible to automate, organize and start the journey of wealth creation through curated financial products like Mutual Funds, Digital gold.

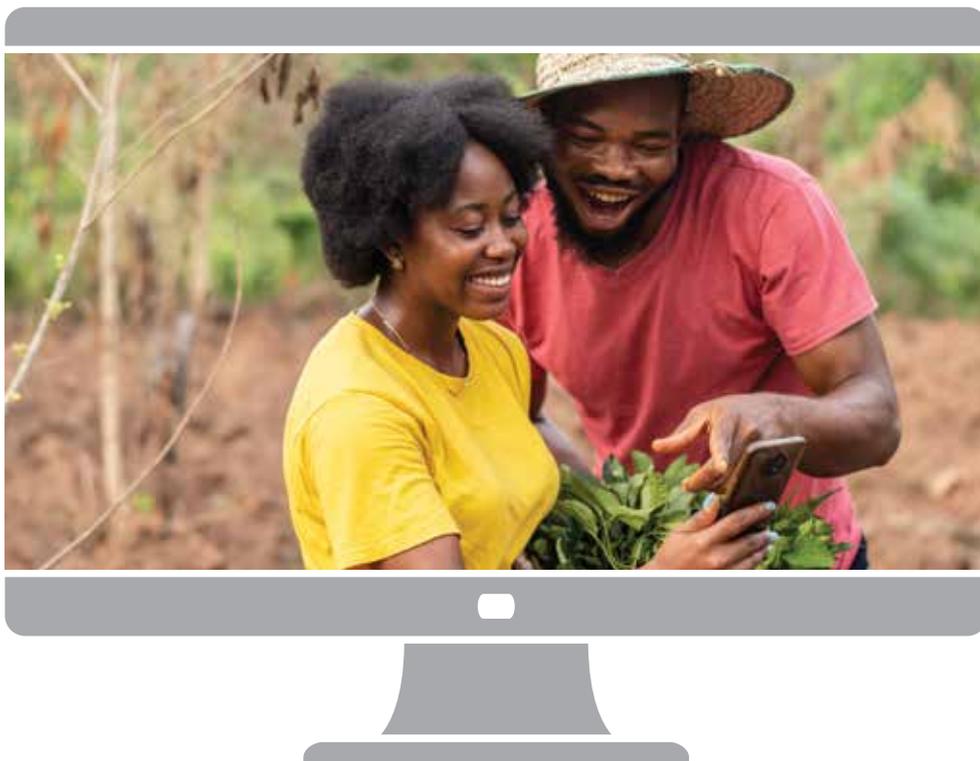
Recognizing the need to solve for wealth creation by women in all economic strata, a unique approach to product building will continue to evolve and be deployed in other regions in the future.

⁷ In India, Financial Literacy Programs Are Lifting Families Out of Debt and Fueling New Prosperity, Asian Development Bank 2022.

CONCLUSION

The World Bank identifies financial inclusion as an enabler for 7 out of the 17 Sustainable Development Goals as it touches upon so many facets of modern-day society. Over the last decade financial inclusion has been accelerated through the advent of digital wallets and mobile money, pioneered in Africa and taken to new levels in countries like India and Brazil.

Universal participation and gender equality in the financial system is critical to global climate action initiatives, as LMICs are on the frontline of these efforts. Fintechs are identifying important gaps in infrastructure and gender bias in the financial products available in the market. These companies can be the catalyst, changing the landscape and extending targeted financial services to women and rural communities that have been traditionally overlooked.



DIGITAL INCLUSION



Without digital inclusion, financial services cannot be delivered at scale in remote and rural areas. Mobile internet connectivity has delivered significant economic benefits, reduced poverty and transformed lives. It has also provided people with access to information and services that would have otherwise been unavailable.

However, globally more than 3.7 billion people remain unconnected, with 3.4 billion people living in areas covered by mobile broadband networks but who are unable or unwilling to use it. The unconnected are disproportionately poorer, less educated, female, persons with disabilities and rural, with 234 million fewer women than men using mobile internet in LMICs.⁸

The GSMA is committed to closing the gender gap in mobile internet and mobile money services in LMICs, unlocking significant commercial and socio-economic opportunities. Through their Connected Women Programme the GSMA is working with mobile operators and their partners to address the barriers to women accessing and using mobile internet and mobile money services. Successfully, targeting women not only advances women's digital and financial inclusion, but unlocks significant growth potential for the mobile industry.

Critically for the fight against climate change, significant gaps in mobile coverage remain in developing regions. In Sub-Saharan Africa just around 25% of the population uses the internet. The region also accounts for almost half of the 450 million people around the world who do not live in areas covered by 3G or 4G mobile networks.

⁸ Digital Inclusion: Driving mobile internet adoption and use, GSMA 2022.

Mobile technology is particularly important to drive connectivity forward in Africa, as it accounts for more than 98 percent of broadband connections. To better understand these trends, the World Bank and the GSMA recently undertook a study using geospatial analysis to overhaul connectivity policies in seven African countries.

CASE STUDY

World Bank & GSMA: How to Expand Mobile Internet Coverage and Adoption in Sub-Saharan Africa

To gain a better understanding of the policies and interventions needed to accelerate connectivity in Sub-Saharan Africa.

Project Scope: this study focused on mobile connectivity, although it recognized the importance of enabling the use of various broadband technologies that respond to demand.

- It mapped mobile coverage and adoption in Africa at the highest possible resolution in Benin, Democratic Republic of Congo, Ghana, Nigeria, Rwanda, Sierra Leone, and Tanzania
- It simulated the effects of different policies using granular data on both the location of infrastructure and demand for mobile and internet services
- Reviewed the impacts policy reforms could have on coverage and adoption, as well as the additional investment needed to achieve universal connectivity by 2030

The study found that mobile operators are very close to the 'market frontier' for 2G coverage, with at least 87 percent of the population covered across the seven countries, however extending mobile broadband to areas with no coverage presents a substantial economic challenge.

While 3G and 4G coverage are lagging at 74 percent and 48 percent of the population, respectively, they could catch up with 2G coverage in the coming years

if spectrum management is updated. If expected 4G adoption was 20 percent in (mostly rural) areas currently not yet covered, operators would extend 4G coverage to more than 89 percent of the population without the need of government supply-side subsidies.

Infrastructure sharing at the site level would enable coverage to expand while maintaining service-level competition, while aligning tax policy with best-practice principles and removing distortive sector-specific taxes solely applied to the mobile sector would provide a further catalyst for change.

Lack of demand, given affordability and other barriers to adoption, is the fundamental reason why universal 4G coverage will be challenging without further policy reforms and public investment, and why 'leapfrogging' to 4G is unlikely to occur in rural areas.

Government tax and infrastructure policies and private sector technology driving down the costs are needed in tandem to increase internet coverage to rural areas enabling more effect climate action and sustainable economic development in local communities in LMICs.

In addition to GSMA's Connected Women programme they've also launched the Connected Society programme, which focuses on expanding rural coverage and addressing the lack of mobile internet adoption.

In LMICs a number of barriers still remain to digital inclusion including low Return on Investment (ROI) for MNOs, punitive government taxation and lack of effective infrastructure policies. Factors effecting end users such as the cost of handsets and the pricing of mobile data also needs to be addressed to promote more universal access. Therefore, a range of public and private sector strategies need to be developed in order to extend coverage to rural communities and remote areas.

One company in particular, the World Mobile Group, has set out to challenge these limitations. Their company's mission statement is: to create an innovative and high impact mobile network with a tangible socio-economic effect.

The intended positive outcomes include economic and gender empowerment through overcoming the restraints of location or origin and to give small businesses in LMICs the chance to access and thrive in the global market.

Q CASE STUDY

World Mobile Group: Smart Village in Tanzania (Zanzibar)

This digital inclusion project was the first such undertaken and has quickly followed by World Mobile providing mobile connectivity to the entire island of Zanzibar.

Project Scope: Connecting a fishing village in Tanzania is home to around 200 people. Only accessible via dirt roads and often affected by flash floods.

- To install a wireless network at a fraction of the cost by using renewable, solar-powered energy and hybrid unlicensed spectrum
- Powered by blockchain and the sharing economy, an AirNode was deployed now owned and operated by the villagers themselves
- Gave the local people access to decentralized digital IDs and online services such as microcredit loans, banking, and healthcare

The local community now have access to WiFi so they can connect their phones to the World Mobile network, making it possible to learn, watch the news, message friends and family and do business. Using the WM, villagers will be able to top up credit in local shops to make low-cost calls both locally and internationally.

Just months after this "proof of concept" the Smart Village saw rapid growth with the number of shops and bars opening, and thanks to our backup power and solar lighting, vendors still trade well into the night.

The inhabitants of the Smart Village now the freedom to explore the social and economic benefits of the Internet. From developing online businesses to accessing mobile banking through digital inclusion.



An underlying key to digital inclusion is the provision of digital identity. In the last comprehensive report on digital IDs in 2018 the World Bank found that around one billion people globally had no way to prove their identity and in Africa alone, half a billion people had no form of identification (ID). Additionally, the report uncovered the fact that one in two women in low-income countries do not have any proof of identity.

As mentioned previously India has tackled this head-on introducing a biometric identification system for

all residents. The Unique Identification Authority of India (UIDAI), a statutory authority set up by the Government of India which has since provided 1.3 billion people with digital IDs.⁹ In Sub-Saharan Africa, made up of 46 different nations there are a number of initiatives to drive digital ID adoption.

An example of this is ID4Africa founded in 2014. It's an NGO that accompanies African nations on their journeys to develop robust Identity ecosystems. They believe that in order to ensure social development matches economic growth, inclusiveness is essential. Digital IDs not only promote financial inclusion but also give access to government services, benefits and enfranchises more people in political systems.

CONCLUSION

It's clear from studies and India's success story of rapid digital inclusion that governments need to create the conditions for participation and innovation to thrive. Although the barriers to digital inclusion seem diverse in nature, the growing emphasis on partnerships between LMICs and the Global North will require a greater drive to increase connectivity. Climate action and major land regeneration projects are taking place in rural areas of Africa and other developing regions. This requires a digital and financial infrastructure which will lend itself to sustainable longer-term development and an amplification to the range of financial services offered.

As women make up a large percentage of the rural and agricultural workforce their inclusion is critical. Initiatives such as the GSMA's Connected Women Programme with participation from a growing number of mobile network operators will have a much-needed salutary effect on gender empowerment in LMICs.

⁹ Leveraging Digital Identity for Greater Financial and Social Inclusion, International Institute for Sustainable Development 2022.



LAST MILE PAYMENTS



Last mile and cross border payments have reduced in cost with fragmentation of the Money Transfer Operator sector. The need for corporates and diasporas to find cheaper and faster ways of remitting funds has accelerated this trend. Furthermore, corporate expense tools have enabled NGOs to better manage funds to field officers. However sustainable development investment and aid payments into rural and remote communities is still an area that remains underserved.

The disbursement of payments to last-mile customers in rural communities in LMICs is often limited due to poor transportation and communication infrastructure and the relatively small size of financial transactions.

Although Digital Financial Services (DFS) have brought increased access to payments, credit, insurance and other financial services for those in rural communities, they still have very limited access to adequate financial services, whether digital or in person.

Access to a digital banking account proved to be even more important during the COVID-19 pandemic, especially as bank branches closed or were not as easily accessible. In 2020, mobile money grew at 12.7%, twice as fast as had been forecast for that year reaching 1.2 billion accounts, mainly because governments and international organizations increased usage of mobile money networks to distribute aid, subsidies or social assistance payments to beneficiaries.¹⁰

¹⁰ The State of the Industry Report on Mobile Money 2021, GSMA.

Q CASE STUDY

Mad Rock worked with government and local communities in The Solomon Islands to build a digital payment system to distribute salaries and funds across the country's 960 islands.

Project Scope: Provide financial access to the geographically dispersed unbanked & underbanked population, many living in smaller towns and villages

- Create a viable ecosystem of agents and merchants across the country
- Distribute payments to government workers, teachers, police, nurses on both smart and non-smart phones.
- Allow NGOs to distribute payments quickly and cost effectively on a wider footprint (World Vision, Save the Children and the Pacific Financial Inclusion Programme)

Monsoons and cyclones and the dispersed population among the island made services provision physically impossible at certain times of the year.

Digital Wallet for the Solomon Islands (Ezi Pei) was launched in 2020 which enabled; domestic and cross border money transfer, airtime top up, electricity and water meter top up and cash in/cash out agent network all payment services including bulk payments.

Currently over 19,000 users who are newly financially included, completing an average 5300 transactions per day. All transactions are secure, transparent and remotely traceable down the last mile to the point of receipt. They are conducted using mobile data (if available) or SMS.

During Covid 19 the government declared the Ezi Pei wallet an emergency service for cash distribution during the pandemic. It now intends to expand the service and expects to have 55,000 users by YE 2022.

Pre-pandemic, agencies and governments also used Digital Financial Services (DFS) to disburse payments for agriculture growth programs, while agriculture value chain companies used DFS to distribute loans for inputs and pay farmers directly for their crops or livestock.

Cash-in/cash-out mobile money agents are the bridge between the financial services providers and customers, but providers have struggled to expand these networks to farmers and communities in rural areas where sparse populations lead to lower transaction volumes and weaker financial incentives for businesses to serve as agents. This is where donor agencies have a role to play by helping develop agent networks in the last mile.

Innovative solutions have emerged to bridge the gaps in the last mile from leveraging blockchain and modifying sim cards to enable additional functionality on feature phones to utilizing voucher systems, that ultimately increases inclusion and lowers costs in remote areas.

Companies such as Bibimoney, Hiveonline, NextGen Telesolutions, and Ping Money have looked to address and remove friction from last mile payments for women and rural communities.

Q CASE STUDY

Hiveonline partners with the Association of Women in Agriculture in Kenya (AWAK) to explore the digitalisation of Women's agricultural groups.

Project Scope: To promote gender empowerment in rural communities through the mycoop.online application

- Implemented a platform that provided groups with a financial identity and access to finance opportunities.
- Using low-energy blockchain technology, myCoop.online monitors commitments and transactions.
- Participants adopted best practices in agriculture, which were validated through the data collected.

As production plans and transactions are recorded through the app, both individual users and groups themselves build a financial history that can then be shared with financial institutions.

AWAK and their field agents are able to receive real-time data on association activities to monitor group progress without the need for in-person visits through the Hiveonline dashboard. In another rollout in Zambia, there was a 30% reduction in travel to groups, saving in costs and carbon footprint.

This collaboration aims to build the capacity of farmers through the use of digital platforms, increasing access to finance and becoming informed decision-makers and key industry players. This project is being rolled out to 50 groups with 25 members in each group and an 80% women representation.

Initiatives such as these specifically focused on facilitating community, female participation and developing practical tools and training can be adapted to supplement the existing digital payments infrastructure.

Other companies such as NetGen Telesolutions and Bibimoney are focused on enhancing existing technology, infrastructure and mobile device functionality to facilitate secure last mile payments into the hardest to reach areas. Disbursement of humanitarian relief and social assistance is a key component of longer-term sustainable development.

Instant, secure and transparent digital payments will provide the foundation for successful climate action and regenerative agriculture projects. As the world economy becomes more reliant on LMICs for long term global environmental security of the planet interconnectivity and efficient last mile payments are key.

Q CASE STUDY

NextGen Telesolutions are working with UNICEF and the UNCHR on disbursement of digital aid payments in Libya.

Project Scope: To provide targeted digital aid payments via adapted mobile technology and smart eVouchers

- Work with UN agencies to help children, refugees and the needy for food, medicines and living expenses, with digital payment capabilities
- Create multiple sub-wallets under the UN agency master wallet for each programme in country to ensure full visibility and accountability of disbursed funds. The sub-wallets are for each beneficiary and can be extended to multiple family members also under the user wallet
- Limit spend to retailers appointed for this specific purpose, using the funds and authorisations credited against the beneficiary account by the UN agencies

Vouchers can be created on demand or

sent out in bulk, depending on the UN agency requirements.

NextGen technology delivers a 100% digital transaction, based on eVouchers and SMS text-based vouchers for the beneficiary that can be scanned by a merchant smart phone mobile app with a phone's camera.

The redemption is then mapped to the Voucher setup in the master engine. Each voucher can be for a specific activity or configuration and is unique to each beneficiary. This tech solution is low-cost, with minimal merchant on-boarding costs.

NextGen's has developed a range of mobile technology adaption techniques designed to provide NGOs, governments and MNOs with the ability to disburse funds to the most basic mobile phone models, ultimately covering 100% of all beneficiary device types.

CONCLUSION

Digital technology and blockchain has enabled a broader, more robust approach to the development of an inclusive payment system. Specialist more targeted last mile payment innovation is still in its early stages but will gather momentum as aid donors, investors in climate action and gender empowerment seek to accelerate impact, requiring increasingly transparent and secure payment methods.

This has already begun to take effect in remote areas where high-cost branch and ATM networks are not feasible, but where innovative microfinance institutions have proliferated. Agent and mobile banking models have redrawn the landscape in many LMICs as mobile network operators (MNOs) assume an important role in the provision and distribution of financial services.

New "for-purpose" business models powered by low-cost technologies aimed to drive financial inclusion en masse will continue to improve last payments infrastructure. This key area of sustainable development will accelerate and ultimately provide a platform for the introduction of additional last mile financial services such as microinsurance and microlending.



SUSTAINABLE LAND USE



As of 2022, 75% of Earth's terrestrial environment has already been altered by human actions. In the last two hundred years alone, humans have converted or modified 70% of the world's grasslands, 50% of the savannah, 45% of the temperate deciduous forest and 27% of the tropical forest.¹¹

Transitioning away from current extractive and intensive land-use models towards sustainable land use techniques would have a number of significantly positive effects. Firstly, it would make a substantial contribution

to achieving net-zero targets through halting deforestation, land conversion and soil degradation. Sustainable land use mitigates a number of risks for businesses especially in view of climate change impact, while regenerative agriculture ensures better productive opportunities of the future.

It's estimated that the forest, land and agriculture sectors have the potential to deliver up to 30% of the needed climate mitigation actions from now through 2050. The prevention of deforestation and land conversion, increased investment in restorative land use must now be central to companies' climate commitments. Additionally decarbonizing land use is critical to achieving the global net zero targets.

¹¹ Land Matters for Climate Reducing the Gap and Approaching the Target, UNCCD 2022.

According to the Science-based Target Initiative (SBTi) Corporate Net-Zero Standard, companies reliant on land use need to reduce land-based emissions by at least 80% by 2050.

Many businesses especially food and beverage companies, depend directly on the land for their operations and supply chain. However, land-related risks to businesses are not always immediately apparent, as their dependence on land is often embedded in the supply chains.

Land use-related reputational, market, legal and financial risks are also coming to the fore. Governments are taking more ambitious action to conserve and restore land, for example, the EU's landmark legal proposals to ban imports of beef, palm oil, soy, cocoa and other products linked to deforestation.

A sustainable transition in food, land and ocean-use systems can create almost \$3.6 trillion in annual value and 191 million jobs by 2030. Preserving and restoring land resources does not only demonstrate good foresight but clearly is also a strong business opportunity. Considering that food systems are the world's largest employer of young people, ensuring strong and resilient livelihoods in the sector would build on a sustainable vision. For this business investments are needed to develop the skillsets for them to pursue meaningful work or become 'ecopreneurs' in the new restoration economy.¹²

Women have a critical role to play in regenerative agricultural and sustainable land use. JustDiggit has combined gender empowerment with innovative land restoration techniques to back vegetation with the help of grasses.



¹² Why businesses must care about sustainable land use – and actions they can take to protect it, World Economic Forum 2022.

Q CASE STUDY

JustDiggit: Increased income for Maasai Women through regenerative land use

Project scope: Grass seed banks managed and maintained by Maasai women groups and form small parts of communal land that are used for the production of grasses and grass seeds. The grasses that grow on the grass seed banks are protected from grazing livestock and wildlife by a so-called live fence of local shrubs. They form an oasis of green in the barren surroundings.

- Increase opportunities for Maasai women to undertake regenerative agricultural projects and generate income streams for financial independence
- Produce grass seeds which are sold by the women in local markets or to accelerate impact by enabling other greening projects.
- Protect the local environment and significantly reduce land degradation in areas under threat from desertification.

Once the grasses are fully grown, the grasses produce grass seeds which are sold by the women on local markets or to other greening projects.

One major issue faced was that Elephants love to eat the grasses of the grass seed banks.

Unfortunately, this causes damage to the fences used to protect the grasses and the grass itself. But Save the Elephants came up with an innovative solution: using beehives in the fencing of the grass seed banks. Elephants are terrified of bees. When they try to enter the grass seed banks, the bees in the hives woke up and scared the elephants away.

The other big benefit for the Maasai women groups is the production of honey. The women have been trained in how to maintain these beehives and how they can harvest the honey. By selling the honey they create an extra income.

Overall, this dual use project and the income generated serves as an alternative livelihood, making the women more independent. It enables women to pay for school fees, health care and support their family. Other people within the communities see the successes of the grass seed banks, providing the women a higher status within their community.

One of the main barriers to investment in new sustainable land use and regenerative agriculture techniques is a lack of recognized standards and methodologies in order to measure success. However, Land to Market which was the world's first outcomes-based verified regenerative sourcing solution assesses land for regenerative outcomes using the Savory Institute's Ecological Outcome Verification protocol.

So far, the Savory Institute has trained more than 12,000 farmers in regenerative agriculture and measured the soil health, sequestered carbon, water infiltration rates and biodiversity of millions of acres of land to date. This has led to hundreds of products in markets around the world, from small brands, to multinational corporations, that feature the Land to Market verification seal.

Ecological Outcome Verification (EOV) is the science behind Savory Institute's Land to Market program. EOV was developed in collaboration with leading soil scientists, ecologists, agronomists, and an extensive network of regenerative land managers around the world. EOV is a practical and scalable soil and landscape assessment methodology that tracks outcomes in biodiversity, soil health, and ecosystem function (water cycle, mineral cycle, energy flow and community dynamics). EOV applies to grassland environments, including natural and planted grasslands, as well as grassland mixed with crop and/or forest areas. Farms demonstrating positively trending outcomes in land regeneration through EOV are entered into a "Verified Regenerative Supplier Roster", from which participating buyers, brands, retailers and end consumers can access products or services that have been produced on a verified regenerative land base.

Farms are set up with EOV using satellite cartography. A farm monitoring plan will combine Short Term monitoring stations, distributed extensively throughout the farm, with permanent transects and photo-points located across the farmland. Both monitoring procedures are linked by the Ecological Health Index, calculated using the scorecard.



Q CASE STUDY

SoilWatch: Peace in the Ground - Environmental peacebuilding amongst refugees and host communities

This environmental and market analysis was the first of its kind, combining in depth remote ecosystem analysis with on the ground socio-economic data to support a project targeting refugees.

Project Scope: Supporting the EU funded International Organisation for Migration project “Mitigating the potential for tension and conflict in areas impacted by the refugee influx in Sudan” with evidence around land use, environmental degradation, livelihoods, and deforestation. Combining advanced remote sensing techniques with socio-economic data, the project analysed the degree to which current practices in agropastoral livelihoods and forestry are sustainable, to what degree the ecosystem’s sustainability is currently threatened, and what mechanisms were available to improve outcomes.

- Soil health and erosion risk and vegetation productivity used to express land degradation
- Above Ground Biomass, expressed in carbon density of woody biomass in tC/ha, as indicative of the loss of perennial vegetation on the land.
- High temporal frequency satellite data allows for trends analysis in the periods preceding and post the establishment of the refugee camp.

Also, a factor was human-induced productivity losses resulting from suboptimal land management highlighted

The project found that intense land degradation was taking place and leading to lowering yields for farmers and pastoralists. Indications were that the refugee influx along with the economic crisis in the host community intensified deforestation for charcoal and firewood, exacerbating the issues of land degradation and tensions between communities.

The impacts of environmental degradation had implications for food security, stability and conflict, migration, soil health, biodiversity, and so on. Although climate change is commonly used as an explanation and a catch-all term for such environmental issues, the project found a host of local and human activity for environmental loss, and an understanding of this at a local level.

The assessment, mapping and analysis of the project laid the ground work for evidence-based decision making to support sustainable productivity increases through community-based natural resources management committees, soil regenerating and climate smart agricultural techniques, including interventions funded by carbon financing mechanisms.

CONCLUSION

Other start ups in regenerative agriculture such as AgVenture and AgWild in East Africa have recognized the need to employ Monitoring, Reporting & Verification which enables projects to benefit from investment via the voluntary carbon credits markets. This investment is critical to reverse the issues associated with mono-cropping of cereals, like increased soil-borne disease, declining yields and diminishing productivity. With climate change triggering more extreme weather events these challenges will be exacerbated requiring further investment and strategic planning.

Indigo AG has fully embraced carbon credits as a funding mechanism to accelerate regenerative agriculture and land restoration. Advising farmers on climate-friendly strategies to pull carbon dioxide into the soil and capture emissions, it funds its work by selling carbon credits to corporates with the farmers receiving 75% of the proceeds and Indigo AG gets the rest.

As we will examine in more detail later in this report; satellite technology and remote sensors are supplementing and, in some cases, replacing the need for examining changes to land use on the ground. There's been a proliferation of regenerative agriculture use cases that will both tackle the effects of climate change and enable women and local communities to increase their income.

These techniques and agritech will need to develop in parallel with digital and financial inclusion that will pave the way for additional training, education and the access to the markets. In particular financial products like micro insurance and micro lending will ensure that gains made in approved farming techniques will be further protected from unforeseen events.





CARBON OFFSETTING AND CLIMATE FINANCE



It is widely acknowledged that carbon markets are a very important tool to reach global climate goals, particularly in the short and medium term. They mobilize resources and reduce costs to give countries and companies the space to accelerate the low-carbon transition and be able to achieve the goal of net zero emissions. At the COP26 climate summit in Glasgow, the approval of Article 6 - the Paris Agreement's rulebook governing carbon markets, was a further recognition of their importance to the global community's commitment to net zero.

However, the voluntary carbon credits market has suffered from opacity and over-complexity where carbon asset developers on the ground and in rural communities in LMICs have been forced to be price takers resulting in most of the capital raised being lost through a fragmented high-friction market.

Ajay Ubhi, Senior Research Analyst at African Energy states; "Demand for voluntary carbon credits from Africa has risen sharply over the past decade, but in recent years the supply of new credits has fallen away. Developers blame a complex and fragmented marketplace, with numerous credit certifiers, exchanges, brokers and aggregated funds making it challenging to navigate and access financing opportunities."

Legacy registries and certification bodies such as Verra, Gold Standard and the American Carbon Registry have sought to increase confidence in carbon offsets through ex post facto auditing and complex methodologies. While these certification bodies ensure high standards and limited scope for greenwashing, this has also left behind many communities and smaller producers especially in developing countries that are unable to manage complex and costly systems and/or cannot rely on sufficient support systems for the upfront investment cost. This has led to a fragmentation and disruption within the market which is unable to service the massive increase in demand.

New verification tools are replacing traditional manual certification processes in order to give instant and immutable verification. Monitoring, reporting and verification (MRV) data via satellite imagery, remote sensors, LIDAR and IoT on the ground is being integrated with Blockchain or Distributed Ledger Technology to provide real time updates.

Companies such as eLEAF, Satelligence and Treeconomy are leading the way in remote land monitoring and are continuously developing new techniques that increase precision and lower costs. Treeconomy is the most carbon focused using high-resolution remote sensing data improve the accuracy of carbon accounting within carbon removal projects. Satelligence assesses patterns and trends in forests and agriculture, tracking deforestation and environmental risks in near real-time. Their mission is to make sustainable agriculture mainstream through providing data that leads to climate positive sourcing and investment decisions.

These technologies not only serve to attract greater investment in regenerative agriculture but will also play a significant role in enabling critical financial inclusion including parametric insurance to help protect against climate related risks. The decentralised nature of the sector also holds great promise for reaching underserved and marginalised communities such as women producers. Much of the work around gender empowerment in the sector remains focused on the social aspect, but this could be transformed into ensuring better access to finance for women producers.

Leveraging these advances in remote monitoring, a number of carbon credit marketplaces have emerged built on blockchain with some also adopting cryptocurrency based primarily in global financial or tech hubs such as Berlin, London, New York, San Francisco and Singapore. Air Carbon Exchange, Climate Impact X, Climate Trade, FlowCarbon, JustCarbon, LIBER, Toucan, Xpansiv are some of the entrants to the market that have deployed a range of Distributed Ledger Technologies (DLT) including Alastria, Celo, Chintai, Polygon in order to bring voluntary carbon credits to market. Sylvera, a carbon credits "ratings agency", has also entered the market applying ratings based on a carbon score, additionality and permanence showing that the market is trying to find structure. However, it appears that the main focus thus far has been on what technology can deliver downstream into climate markets and much less on increasing impact, quality through transparency upstream and ensuring that the flow of funds to projects on the ground to help accelerate climate action and the supply of high-quality offsets.

Q CASE STUDY

eLEAF: Scaling Up Agricultural Insurance in Togo

This project started in October 2021 and is set for two years.

Project Scope: Increase the resilience of small-scale farmers against climate-related risks in Togo through the eLEAF satellite and remote sensing expertise and technology.

- Awareness & Marketing Campaign to register 40.000 farmers
- Risk Modelling and Product Development
- Distribution of parametric insurance products to smallholder farmers in all regions of Togo

Within two years, the project is expected to facilitate climate-risk insurance for 70.000 households. By 2025, this is expected to increase to 560.000 households.

Togo's agricultural sector continues to be highly vulnerable to climate variations as a

result, Togo's farmers observe increasingly severe and frequent climate weather events that affect or even annihilate their production thus perpetuating poverty.

eLEAF is developing a weather index insurance product based on relative evapotranspiration (RE) and precipitation data. The amount of benefit payable is predetermined and varies with the severity of the drought / excessive rainfall measured by the average RE level and precipitation observed at each phase of the insurance period.

eLEAF is developing three new parametric insurance products against drought and excessive rainfall for maize, rice, and cotton and upscale and enhance the existing parametric drought insurance product for soy.

The envisaged insurance product will not only contribute to the protection of farmers against climate risk but also increase the financial literacy and inclusion of farmers.

This full layer of trust and transparency is required for full scalability, boosting buyer confidence, preventing double counting and increasing the price of the final offsets so more funds can directly reach the projects and local communities for reinvestment in regenerative agriculture nature-based solutions and other projects that preferably include social impact projects such as gender empowerment and youth development.

Other entrants to the carbon markets such as Stockholm based EarthBanc and Cynk the first such carbon offsets platform to emerge from Africa, headquartered in Nairobi, are looking at a more inclusive end-to-end approach which uses DLT to also enable broader grassroots and local community participation in LMICs by also using technology upstream.

This philosophy supports the vision that “high-quality” carbon offsets should be determined as such, dependent to a large extent on the level of social impact. This is particularly relevant to women, indigenous groups and rural communities as these groups have traditionally been undervalued in favour of large-scale projects run by developers.

Q CASE STUDY

Cynk: Carbon Offsetting promoting Gender Empowerment

Cynk was launched in April 2022, becoming the first carbon offset platform launched in Africa using Blockchain and DLT technology to bring high-quality, transparent carbon offsets to market, delivering a range of social impact initiatives including gender empowerment.

Project Scope: Climate action carbon project to reduce deforestation in Kenya empowering women and youth.

- Secure a fair transparent market price for “high-quality” carbon credits to accelerate investment and the flow of funds into climate action in Africa.
- Guarantee that 75% of revenues generated from the sale of the carbon credits reach implementers.
- Deliver social impact programme providing free feminine hygiene products and education.

With more than 70% of national energy demand coming from fuelwood, Kenya is losing over 17,000 ha of natural forest per annum. As the country works with partners such as the FAO to increase

forest cover, replacing unsustainably sourced fuelwood with upcycled biomass briquettes and pellets made from agri-waste is key to satisfy its energy intensive food processing production sector.

Cynk has partnered with the HBAR Foundation and its Sustainable Impact Fund to bring trust and transparency to carbon projects that have traditionally been excluded from the market.

Leveraging Hedera blockchain to tokenize carbon offsets, Cynk combines technology with its social impact manifesto, ensuring sustainable development for local communities as well as climate action.

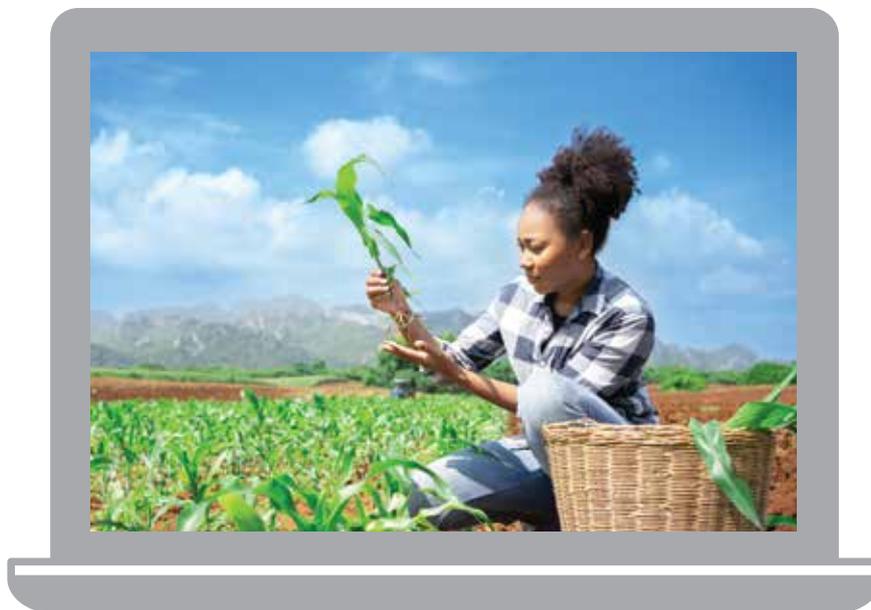
In conjunction with Ruby Cup, this project will deliver 4000 silicon menstrual cups in the Kisumu area meaning women working on the project and their daughters will have access to hygiene products.

Additionally, 8 mentors from the Golden Girls Foundation will deliver an educational workshop, carry out follow up sessions 8-12 weeks later and complete data collection sessions 6 months after distribution.

CONCLUSION

The approval at COP 26 of Article 6 of the Paris Agreement's rulebook governing carbon markets has given the sector renewed impetus. However, the market remains highly fragmented and concentrated. Blockchain and DLT technology is being deployed to increase trust and transparency, where opacity was commonplace, and to connect projects directly to end-users. The vast majority of entrants to the market are however focused on platform creation downstream for opportunities into the climate markets rather than upstream into project development and creating further impact.

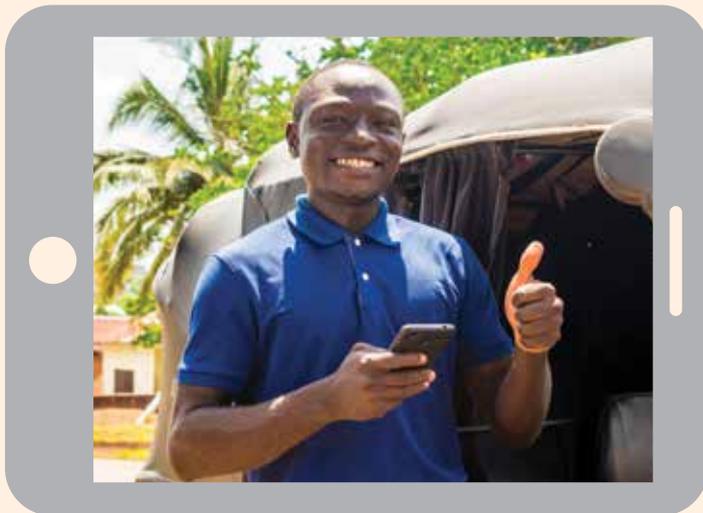
The main issues that need to be addressed in parallel are project development, geographical concentration of existing projects, market price mechanisms and the flow of funds, social impact created by projects and the supply side shortage of high-quality credits. Importantly, new methods of sequestering carbon are becoming mainstream like blue carbon and regenerative agriculture which is hugely relevant to emerging economies reliant on cash crops as a source of income and foreign currency. Finally, corporates must consider carbon offsetting as an opportunity to ensure economic viability of our production system beyond the positive social impact. Carbon offsetting can play an integral role in climate action and furthering impact if the stakeholders recognize the need and impact created by high quality transparent carbon offsets.







CONCLUSION



The term last mile in payments will overtime become a misnomer, as remote communities become the origination of many financial transactions linked to climate action, involving projects such as regenerative agriculture and nature-based solutions. Many communities on the front line of climate change are located in rural areas in LMICs where women and young people play a pivotal role in protecting the environment. Therefore, efforts to increase mobile network coverage, the accelerated adoption of mobile

wallets and adapted handset technology such as SIM overlays will be prioritized.

As identified digital inclusion via the roll out of digital IDs is the cornerstone of financial inclusion and LMICs can learn from major successes in India in this area. Government funding and administration are required for this infrastructure to be adopted en masse, but the benefits are clear and have, de facto, extended greater financial independence to women. Mobile technology has enabled companies to build on these gains and extend financial literacy to the traditionally underserved.

Mobile network operators and the GSMA are working to close the coverage gap in LMICs mapping areas and overlaying population density, while leveraging new technologies such as blockchain and long-range antennas to extend the network more cost effectively in rural areas. These efforts have allowed mobile network operators to continue to increase the number of mobile money wallets globally and in turn financial inclusion opportunities.

With digital infrastructure in place, more targeted disbursement of aid or sustainable development funds can be facilitated ensuring accuracy of payments, reduced leakage and use of vouchers for designated purposes. These capabilities lend themselves to protecting more vulnerable recipients including refugees and women. Furthermore, this digital and financial inclusion has allowed microinsurance and microlending products to be launched in more agricultural areas which will further bolster sustainable development and gender empowerment.

After COP 26 in Glasgow carbon credits have come to the fore as a climate financing tool, while the number of marketplaces and developers has also increased dramatically. Distributed ledger technology, IoT, satellite imagery and remote sensors such as LIDAR have enabled Digital Monitoring, Reporting and Verification and the tokenization of carbon credits to help scale the market. Questions still remain relating to the price paid for credits, the role of brokers and critically the amount of funds being received by projects on the ground, especially in LMICs.

In order to accelerate the move from climate action aid to creating the conditions for sustainable development a layering of digital and financial inclusion capabilities needs to take place. Governmental sponsorship is key, however private companies must also adapt their business models to ensure scalability. Following these steps, aid programs can be followed by sustainable development, resulting in access to insurance and lending from the markets.





DISRUPTIVE FINANCIAL SERVICES OPTIONS MENU

DIGITAL AND FINANCIAL INCLUSION

As of the last extensive study in 2017 conducted by Findex data, 1.7 billion people worldwide were unbanked (2021 data forthcoming). Over half of unbanked people included women from poorer households in rural areas or those outside of the workforce. The lack of or limited access to financial services creates a major barrier for communities to economic opportunities and welfare. It is also a major driver for shadow economies which largely side steps formal systems, including efforts and opportunities to ensure better and more soil friendly productive opportunities. The rise of digital knowledge in ensuring more resilient productivity, especially within the agricultural sector provides large untapped opportunities to ensure that communities can access the latest in terms of knowledge.

Digital and financial inclusion require systems approaches from a technological, energetic, and legislative standpoint. At the very basic level two main issues remain at the forefront stalling digital and financial access. Firstly, access to networks both because of cost of mobiles and GBs or lack thereof, as well as identification processes. At a secondary level, targeted solutions for underserved communities require capital to set up and leverage towards economic sustainability. To put these bottom-line issues in perspective, nearly 3 billion people globally do not have access to the internet. One major reason for this lack of connectivity is because traditional mobile networks rarely look to expand into hard-to-reach places. Smaller rural communities offer much lower returns on investment, hence a lack of digital inclusion in these areas. Below, we have identified global solutions which are already being marketed to ensure better digital and financial access to underserved remote areas, women and rural communities.

DIGITAL INCLUSION SOLUTIONS



GSMA: GSMA - Representing the worldwide mobile communications industry

Is a global organisation unifying the mobile ecosystem to discover, develop and deliver innovation foundational to positive business environments and societal change. Their vision is to unlock the full power of connectivity so that people, industry, and

society thrive. Representing mobile operators, it engages its members, governments and civil society, to advance positive policy and spectrum outcomes, facilitate digital innovation to reduce inequalities in our world, and tackle today's biggest societal challenges such as digital inclusion, climate change and sustainability.

World Mobile Group: World Mobile | Bring connection. Share the rewards

Is focused on connecting those with less purchasing power to the global community by partnering with schemes to offer free telephony to otherwise isolated areas. Their work also includes increasing connectivity for young people and women in rural communities who are more likely to be excluded from internet connection through the development of 'smart villages' in LMICs.

Flywallet: Flywallet - Home (flywalletpay.com)

Is an innovative fintech start-up that connects payment, mobility and health services by enclosing them in a single ecosystem and putting safety first, thanks to biometrics and proprietary wearable and IoT technologies. The use of wearable devices will grow in LMICs as costs come down and will provide further digitization and democratization of financial services and other services requiring biometric identification. Wearable solutions could provide important solutions to target communities from a dedicated geographical perspective and provide further financial independence and security for more vulnerable groups including women

TECNO Mobile: TECNO Mobile - Best Phones In India | Latest 5G Models | Online Mobiles (tecno-mobile.in)

Aims to provide the latest mobile technology at accessible prices, allowing the consumers to benefit from the growing range of financial services available on both smart and feature phones. In particular TECNO produces low-cost feature phones and sell them to consumers in LMICs for between USD \$10-12 that includes distributor margins and import costs. Accessing low-cost feature phones is a growing market segment, while at the same time ensuring better financial access opportunities for underserved communities.

KaiOS Technologies: [Explore KaiOS](#) ▪ [Devices - KaiOS \(kaiostech.com\)](#)

KaiOS was launched in 2017 with a unique focus on feature phones, a category that had not seen any innovation for over a decade due to the proliferation of smart phones particularly in the Global North. With a stated mission to close the digital divide KaiOS provides affordable handsets to LMICs and develops feature phone functionality to enable digital and financial inclusion.

Mojaloop: [Mojaloop Foundation - Open Source Software for Payment Interoperability](#)

Its open-source software can be used by organizations to build interoperable, digital payment systems that enable seamless, affordable financial services between individual users, banks, government entities, merchants, mobile network operators, providers, and technology companies, connecting the underserved with the emerging digital economy.

CloudCard Inc: [CloudCard Inc. – Experience the Freedom in Payments](#)

Is a next-gen digital banking and card issuance platform with a mission to provide agility, flexibility and freedom in implementing digital payment and open banking solutions globally. This enables new financial services market entrants in LMICs to provide virtual cards and digital wallets without building proprietary infrastructure increasing opportunities for fintechs in developing countries to provide lower cost off-the-shelf card and wallet solutions.

IDEMIA: [The leader in identity technologies | IDEMIA](#)

Is a global leader in Augmented Identity, that provides a trusted environment enabling citizens and consumers alike to perform their daily critical activities (such as pay, connect and travel), in the physical as well as digital space. Their technology enables users to credentialise, authenticate and analyse identities for frictionless access control, connectivity, identity, payments, public security, and travel at scale which is a critical element in extending both digital and financial inclusion.

ID4Africa: [ID4Africa – Identity for All in Africa](#)

Is driven by the need to establish identity-for-all, both as a legal right and a practical necessity to enable inclusive access to services in Africa. Service-oriented identity ecosystems built on privacy and human rights are essential for the growth of digital economies and is becoming more important as African countries move to implement the African Continental Free Trade Agreement (AfCTA).

HBAR Foundation: [The HBAR Foundation](#)

Through the HBAR Foundation and its Sustainable Impact Fund promotes the use of Hedera Hashgraph distributed ledger technology. It provides funding, support and raises awareness of projects that measurably change how the world works in a specific and attainable way across Environmental, Nature-based, and UN Sustainable Development Goal focused projects to facilitate systemic change for the planet.

FINANCIAL INCLUSION SOLUTIONS



SALT: Home | SALT

Founded by a group of women thought leaders in the Indian financial services sector, SALT is focused on gender empowerment through financial inclusion. The underserved population is largely female today and with the growth in the 'gig economy' and informal employment this gap in service is likely set to grow. SALT is addressing this trend with a financial planning

and investment app that's purpose is to give women more control over their money. The aim is to have women making more financial decisions leading to greater economic independence.

Asset Direct: Home | Asset Direct

AD has created the world's first bank account with a singular focus on servicing the underbanked globally. Their account has access to a universe of financial products from thousands of providers that service the under-banked. The company has partnered with thousands of corner stores globally in an effort to reach those that are most difficult to serve. Each store sells access to the account and subsequent products, generating an income stream for them, while empowering people in their local community to access banking and other financial services for the first time.

Pula: Home - Pula (pula-advisors.com)

Has restructured insurance models, using technology and parametric insurance to insure the previously unbanked, uninsured, untapped market of 1.5 billion smallholders worldwide. Delivering innovative agricultural insurance and digital products, helping smallholder farmers endure yield risks, improve and encourage sustainable farming practices and bolstering their income.

Inclusivity Solutions: Home - Inclusivity Solutions | Digital Insurance

Builds, operates and innovates digital insurance solutions that enable financial inclusion and address the protection gap in emerging markets. They partner with mobile operators, banks, insurance companies and other financial institutions to deliver simple and affordable insurance cover through mobile phones.

MFS Africa: MFS Africa | Africa's Largest Digital Payments Gateway

Accounting for over 400 million mobile wallets in Africa MFS is one of the major players committed to accelerating financial inclusion. It delivers infrastructure that connects mobile money users and service providers, mobile financial solutions that are designed connect individuals and SMMEs in Africa to the global digital economy. It operates in over 35 African countries and 600 corridors that connect Africa with Europe, the United States, China and India. Partnering with NGOs such as World Vision, Save the Children, Oxfam, USAID, Care MFS has increasingly focused on humanitarian actors and their disbursement of aid in the last mile and vulnerable communities.

Global Technology Partners (MFS Africa): ** Global Technology Partners ** (gtplimited.com)

Offers the processing solutions developed specifically for prepaid primarily focused on Africa, with a presence in over 30 Sub-Saharan countries. GTP has leveraged its payment solutions to provide financial inclusion to the diverse seafarer population in the maritime industry and has delivered last mile government disbursements to farmers and students working and studying in remote areas.

TerraPay: TerraPay | The global payments highway

Registered and regulated across 25 global markets, TerraPay is a partner to banks, mobile wallets, money transfer operators, merchants, and financial institutions globally, creating a more expansive and inclusive international financial ecosystem. It also has focus on lower the cost of cross border remittances for diasporas sending money home to relatives and others.

M-PESA: M-PESA (vodafone.com)

A pioneer in mobile money it provides over 52 million people in Africa with a safe, secure and affordable way to send and receive money, top-up airtime, make bill payments, receive salaries, get short-term loans.

DOCOMO Digital: DOCOMO Digital | Platform for Telcos and Digital Merchants

Partners with carriers, merchants, OTT services, app stores and payment providers in both developed and emerging markets around the world. The company founding vision was to drive financial flexibility among the unbanked through providing mobile wallet solutions to telcos worldwide.

Paymentology: The Ultimate Global Card Issuer Processor | Paymentology

Is a global issuer-processor, giving banks and fintechs access to technology and support to rapidly issue and process Mastercard, Visa and UnionPay cards across 49 countries, mainly focused on increasing financial inclusion in emerging markets and LMICs.

Boku: Home - Boku Inc.

Its technology platform is linked to more than 177 mobile network operators worldwide which verifies user identity, executes payments, provisions new services, and simplifies day-to-day mobile interactions between consumers and digital organizations.

Flutterwave: Endless possibilities for every business - Flutterwave

Builds payments infrastructure to connect Africa to the global economy. Building technology, tools, and infrastructure for businesses and banks in 33 countries who are able to provide more seamless and secure payments for their customers, facilitating more African trade globally.

BiBimoney: bibimoney - The world's first interoperable mobile wallet

A Fintech focused on financial inclusion in emerging markets that provides a secure, interoperable, mobile money wallet solution that works on any phone and any mobile network. It facilitates person-to-person (domestic/international), person-to-merchant, as well as buy prepaid services such as airtime top-ups and make bill payments, while also enabling nano-financial services such as insurance, pension, loan and saving products.

Kita: Kita

Aims to accelerate climate action and social impact by removing "carbon delivery risk" from sellers and buyers in the market, using parametric insurance products that guarantee the quality and delivery of carbon units and carbon removal solutions.

LAST MILE PAYMENTS SOLUTIONS

In 2020 well over \$200 Billion was spent on humanitarian aid and international development. Delivering these funds over the last mile ensuring that marginalised populations and especially women receive direct benefits remains a significant challenge. Ensuring last mile payments are delivered in a targeted, secure and efficient way is paramount to donors, agencies and local communities. As noted earlier, marginalised populations and especially women often do not possess appropriate identifications or certificates, the majority operate informally, have no access to liquidity networks, and interact with limited places that accept digital funds. Furthermore, the lack of common and interoperable solutions, the lack of perceived profitability, the cost of acquiring, the lack of financial education and payments infrastructure are all significant barriers to effective last mile payments.

Many solutions for last mile payments have emerged out of corporate global expense management tools, however a growing number of start-ups are building solutions aimed specifically at women, displaced persons and rural communities. These fintechs will ensure more of the funds pledged reach their intended recipients and vulnerable members of society will have more protection and autonomy.

This growing mosaic of solutions can be deployed by organizations depending on the specific challenges and factors obstructing their last mile payments. Some provide greater control, visibility via customized approval workflows of expenses and budgets while others tackle a lack of infrastructure head on with a range of micro financial service offerings that deliver the transparency and interoperability needed to complete the last mile in underserved communities.



HiveOnline: [hiveonline](https://hiveonline.com) – Creating the sustainable digital economy (hivenetwork.online)

Is building sustainable decentralised finance for financially excluded smallholders, women and local communities, by giving them access to credit and markets. Innovative solutions include: Cooperative Management that is helping farmers grow better crops, aggregate and increase revenues, with access to credit; e-Vouchers that are blockchain based no-touch vouchers facilitating efficient, secure, low-cost distribution of agricultural inputs and emergency aid; Savings Groups including digitised community savings groups such as Village and Savings and Loan Associations (VSLA). HiveOnline provides an integrated suite of solutions that includes access to information, input, as well as last mile payment in very marginalised and remote communities.

NextGen Telesolutions: [Home | Nextgen Telesolutions](https://www.nextgen-tele.com)

Digitizing and bridging the technology gap in secure banking, wallets. Enabling secure contactless payments on any mobile device, including feature phones, for customers, merchants and disbursements for NGOs including the United Nations. Integrating banking, wallets, money transfers, bill and utility payments, pre-paid top-up services and mPOS terminals into a unified offering in LMICs. NextGen is also a leader in SIM overlay technology that adds security and trust to any type of mobile phone, enabling digital signatures, secure credentials, hosting national IDs, health certificates and the ability to hold crypto and digital currencies.

Mad Rock: [Home | Madrocksolutions](https://www.madrock.com)

Provides end-to-end solutions for creating, implementing and scaling customised digital platforms - as closed loop or open loop ecosystems - linking to national switches, domestic and cross border providers in all areas of payments and distribution. Its solutions are focused on innovating in all areas of financial distribution and delivering material impact across the last mile. Enabling seamless digital access for distributors and recipients it facilitates targeted deployment of domestic and cross border distribution in a faster and at a lower cost than traditional solutions.

Leaf Global Fintech: [Wallet 2.0 | Leaf Global Fintech](https://www.leafglobalfintech.com)

Leveraging blockchain and stablecoins the company began as a response to the global displacement crisis and the problem of millions of people having to carry cash across borders each year. Carrying cash is dangerous, inconvenient, and expensive to exchange. Unbanked people and those without smartphones are disproportionately affected. Leaf is currently operational in three countries across East Africa and is quickly expanding globally.

Ripple: [Impact Through Sustainability and Financial Inclusion | Ripple](https://ripple.com)

Has launched an impact fund focused on the adoption of crypto and blockchain aimed at increasing global economic participation, opportunity, and resilience for under-banked and unbanked people. Their global crypto solutions, deliver low-cost and always-on remittances in emerging markets, that could have a significantly positive impact on last mile payments and financial inclusion.

Payhawk: The Financial System of Tomorrow | Payhawk

Combines credit cards, payments, expenses, cash management, and pre-accounting into one integrated platform that's designed to maximize accountability, control and visibility over budgets and spend. Finance teams can manage budgets, spending and close books in real time, while beneficiaries on the ground are able to request approval of funds instantly within a comprehensive reporting system. PayHawk has already begun to adapt their product to support NGOs in funding missions in the field via their app.

Crown Agents Bank (CAB): Crown Agents Bank

Is a regulated provider of wholesale foreign exchange and cross-border payments services connected across developing, emerging and frontier markets. They offer cross-border transaction banking solutions to governments, development organisations, banks and non-bank financial organisations, encompassing FX, payments, pensions, payroll, as well as deposits and trade finance.

PAPSS: PAPSS - Make instant and secure cross-border payments in local currencies across Africa

Looking to build a cross border payments area like SEPA in Europe, PAPSS enables the efficient flow of money securely across African borders, minimizing risk and contributing to financial integration across the regions. PAPSS has broad support including from; Afreximbank, AfCFTA, the African Union and Borderless Africa.

DPO Group: DPO Group | Direct Pay Online | Best Payment Gateway

Partnering with over 50 banks in Africa DPO is the largest African payment gateway offering small, medium-sized and global companies IT solutions that enable them to make and receive online payments cross border and domestically. DPO can be leveraged by African exporters and producers in the agriculture sector to reach global markets and facilitate intercontinental trade.

MoneyCorp: Moneycorp | Global Payments

Is a leading fintech delivering customized integrations, smart payment technology, high regulatory standards and payment accuracy. Their extensive banking infrastructure network allows them to send money quickly and cost effectively across borders including exotic currencies to emerging markets.

PayEm: PayEm: The Global Spend and Procurement Platform

Is an end-to-end finance operating system using technology that delivers automation, control and transparency of funds disbursement. Via the platform, project finance teams can instantly issue virtual or physical cards in line with approval policies, set rules and designate limits to make it easier to stay on track and on budget.

Pleo: Smarter spending for your business - Pleo

Offers smart debit cards that enable cardholders to buy the things they need for work, all while keeping a company's finance team in control of spending. The expense management system is designed to eliminate unauthorized transactions and to reduce the administrative burden on finance and project management teams.

Soldo: Soldo Prepaid Company Cards and Automated Expenses Platform

Combines prepaid cards with a spend management platform – to manage budgets. The focus is to reduce leakage of donor funds and facilitate easy to use expense reporting to monitor spending.

Spendesk: Company cards and spend management software | Spendesk

Has a platform that utilizes corporate cards, invoice payments, expense reimbursements, budgets, approval, reporting, compliance, and pre-accounting within in one solution. Finance teams can define approval workflows, spending policies, and card limits dependent on project requirements.

Moss: Moss: The all-in-one spend management platform (getmoss.com)

Is a technology-enabled expense and financial management solution. With smart credit cards, digital invoice management, and automated accounting. They map customized approval processes to fit with organizational structures and spend policies.

Mesh Payments: Mesh - The Complete Corporate Spend Solution (meshpayments.com)

Provides an expense management tool that gives real-time alerts for payment or funding requests, enables project managers and finance departments to set spend limits, lock payments to vendors. Enables customized approval flows with instant alerts via email, text.

Corpay: Payment Automation, Global Payments & Commercial Cards | Corpay

Is a global money transfer operator that helps organizations track, manage and pay their expenses. Leveraging its multibank platform and global liquidity providers, organisations can complete the last mile of their currency transfers more effectively than through traditional payment corridors.



CLIMATE FINANCE SOLUTIONS

Carbon credits or Offsets have an important dual role to play in the battle against climate change. They enable companies to support decarbonization beyond their own carbon footprint, accelerating transition. Importantly they also help finance projects for removal of carbon dioxide from the atmosphere. However, while the voluntary carbon credit market is currently experiencing significant momentum, it is still relatively small and critically access to financing from carbon credits remains highly complex endeavour especially for remote and marginalised communities and/or producers.



There has been a proliferation of companies that are looking to leverage blockchain technology and new Monitoring, Reporting & Verification (MRV) methods to increase trust & transparency, to accelerate the lead time to market for projects and reducing costs for participation. Fewer are putting social impact at the centre of so-called high-quality carbon credits, that ensures there is significant benefit to those on the frontline, such as smallholders and rural communities combatting land degradation.

Cynk: [cynk | cynk.io](https://cynk.io)

Cynk established on the African continent, provides a platform for voluntary carbon credits which are fully traceable using the carbon negative blockchain platform Hedera. The use of blockchain technology, coupled with the less energy intensive proof of stake approach highlights the latest in terms of ensuring fully traceable and transparent voluntary carbon credits. The offered credits are also strongly linked to a 'social impact manifesto' which prioritises gender empowerment and indigenous communities. Cynk's core philosophy is that long term sustainable climate action in LMICs can only be achieved through improving lives and infrastructure on the ground.

SoilWatch: <https://soilwatch.eu>

Believes in empowering communities to create their own solutions in the climate emergency, preventing desertification and enhancing food security in parallel. By applying remote sensing technology and machine learning, they're able to provide up to date, reliable and low-cost soil carbon measurements and develop verified carbon removal projects in North and East Africa. These projects not only remove CO2 from the atmosphere, but mitigate conflict and food insecurity in the most vulnerable areas where our team has direct on the ground experience.

Earthbanc: [Data driven carbon and green investments - Earthbanc](#)

Combines digital MRV, AI and web3 to scale climate solutions on its carbon platform. Customers can purchase fully audited carbon credits, or choose to invest in carbon removal. Earthbanc has partnered with the European Space Agency to use Satellite and Remote Sensing AI to measure the actual amount of carbon removed.

Justdiggit: Justdiggit | Cooling Down The Planet | Global Warming Charity

Re-greens dry lands at scale with a major focus on Climate, Nature and People. They scale their Re-Greening methods by working with millions of people in LMICs in local communities. Currently Justdiggit is Re-Greening an area the size of the Netherlands across Kenya & Tanzania but aims to work millions of smallholders throughout Sub Saharan Africa to replicate their sustainable, scalable and cost effective methods for soil and vegetation recovery.

Compensate: Compensate

Compensate combats climate change by offering easy access to the highest quality carbon projects, providing tools to calculate and offset emissions both for businesses and individuals. All projects are evaluated on climate impact, biodiversity, social issues, and human rights.

Indigo Ag: Indigo Ag | Harnessing Nature to Help Farmers Sustainably Feed the Planet

Improves farmer profitability and environmental sustainability, through the use of nature-based and digital technologies. Farmers improve their soil health with support from agronomists, soil samples are collected and anonymized verification and credit issuance and when the carbon credits are sold the farmer receives 75% of the revenues.

Agventure: AGVENTURE (agvke.com)

Is one of the emerging regenerative agriculture start-ups using carbon credits as an investment tool to broaden the scope of their work and bring more cooperatives into their network. They work with non-irrigated farms with a focus on enabling Sustainable Conservation Agriculture practices, focused on diversifying cropping systems; identifying alternative crops, learning how to grow them and building markets for those crops. Importantly rotational crops must become part of the economic cycle for the farm. If performed correctly, conservation agriculture can result in lower cost of production and better long-term sustainability for the farming system. Farms using these techniques are seeing increases in water holding capacity, biological activity, yield potential and consistency.

Sylvera: Sylvera Carbon Ratings

Is a leading carbon credit ratings platform, enabling corporate sustainability leaders, traders and exchanges to evaluate and invest in carbon credits. It analyses satellite images, 3-D laser scans and other data to estimate how much carbon is stored in trees. It uses machine-learning technology to grade the likely effectiveness of offset projects that plant or protect forests.

FlowCarbon: Flowcarbon - Climate solutions, powered by blockchain

Employing blockchain technology they aim to accelerate innovation and the scale of climate change solutions through their carbon credit marketplace. Combining a range of MRV solutions and IoT FlowCarbon is working to protect the earth's natural carbon sinks and to incentivize high impact climate change mitigation projects.

Air Carbon Exchange: AirCarbon: A Global Exchange Revolutionising the Voluntary Carbon Market

Their client base comprises of corporate entities, financial traders, carbon project developers and other industry stakeholders. Its aim is to create a digital exchange focused on eliminating market friction in a carbon constrained economy.

LIBER: LIBER: Invest in carbon credits and climate blockchain solutions

Is a platform that enables people to easily invest in carbon credits, offering a financial return on climate action. LIBER was founded on the belief that access to carbon credits

AgWild: AgWild | Cattle for Conservation | Sustainable Livestock Production Laikipia

Supports conservancies and regenerative farms to increase the value from livestock produced in an ecologically and commercially sustainable manner. In addition to enabling regenerative livestock systems and building healthy soils, it provides a market for cattle for local pastoralists under a fair value price mechanism and are working to incentivise improvements in local livestock production to unlock greater value for small producers. Furthermore, AgWild is exploring new methodologies in carbon credits to seek further investment for rural communities adopting sustainable farming practices.

Treeconomy: Treeconomy

Focused on nature-based solutions it uses high quality remote sensing techniques (drone-based LiDAR and satellite imagery) to quantify carbon captured and stored by trees. They package the carbon sequestered and sell this as very high-quality carbon offset to industries with hard-to-abate emissions, such as the aviation sector.

eLEAF: Home - eLEAF

Provides services and tools that are based on satellite data for agriculture, water management and crop index insurance. It has a 20+ year track record in providing satellite-based data and services to optimise agricultural production, support sustainable water management, and to assess climate risk and provide crop index insurance solutions.

Satelligence: Satelligence

Is able to assess patterns and trends in forest and agriculture, track deforestation and environmental risk in near real-time. Their aim is to make sustainable agriculture production mainstream by helping our clients achieve climate positive sourcing and investment decisions. It combines local knowledge, field trips, AI-powered predictive modelling and remote sensing to provide comprehensive MRV for the agricultural sector.

Climate Impact X: Climate Impact X

Will connect an ecosystem of partners, leveraging satellite monitoring, machine learning and blockchain to enhance transparency, integrity and quality of carbon credits. This is designed to enable corporations to take effective action and complement carbon reduction efforts as part of a holistic climate mitigation strategy.



**THE GLOBAL
MECHANISM**
United Nations Convention
to Combat Desertification