February 2023

Igniting SDG Progress Through DIGITAL FINANCIAL INCLUSION

2023 edition

UNSGSA
UNITED NATIONS SECRETARY-GENERAL'S SPECIAL ADVOCATE FOR INCLUSIVE FINANCE FOR DEVELOPMENT

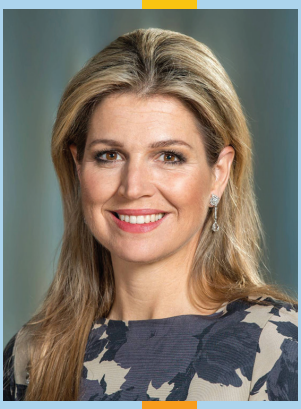
BETTER THAN CASH ALLIANCE

UNCDF
Impact Capital for Development

CGAP

WORLD BANK GROUP

Foreword



Seven years ago, the world first committed to the United Nations Sustainable Development Goals (SDGs). Over that time governments and the private sector have embraced financial inclusion as an enabler to achieve these goals. Access to financial services—including payments, savings, credit, insurance, and investment products— allows households and small businesses to respond to economic shocks, as well as build healthy and productive futures.

Yet, we have also witnessed how fragile this progress can be. COVID-19 continues to have profound negative impacts on poverty and livelihoods. Global conflicts and inflation are causing food insecurity and cost-of-living crises, with developing countries disproportionately affected.

In these challenging times, digital financial inclusion provides an important tool to build resilience and realize the shared prosperity envisioned by the SDGs.

During the pandemic, countries with digital public infrastructure in place—such as connectivity, data interchanges, digital ID and interoperable payment systems—could rapidly deploy government cash transfers to support people. This also helped millions gain access to the formal financial system, receiving and making digital payments for the first time.

Mobile wallets and cross-border remittances help those forcibly displaced meet their basic needs and build up savings buffers as they seek safety and stability. Such services are critical for the unprecedented number of people forced to move.

Digital platforms are offering new opportunities for micro, small, and medium-sized enterprises (MSMEs) to access the formal financial system, often leveraging alternative data for credit scoring, and in combination with online marketplaces. As the backbone of most emerging economies, financial inclusion of small businesses can have a major impact on employment and inclusive growth.

Women are economically empowered by digital financial inclusion, too. In India, paying women benefits directly into their own accounts increases their financial independence and household decision-making power.

An important update from the 2018 compendium is the role of digital financial inclusion in addressing climate change. Emerging economies often face higher climate risks, with fewer tools to manage them. Digital financial inclusion helps households and small businesses manage weather shocks and invest in a green future. For instance, we see smallholders in Mali use index insurance to cope with severe storms, while farmers in Kenya adopt climate-smart agricultural practices through mobile platforms facilitating access to seeds or fertilizer, markets, and financing.

As digital solutions become more ubiquitous, it is important to ensure the rapid digitization does not lead to unnecessary risks, especially for low-income clients. **Therefore, it is vital that technology-based solutions are introduced responsibly, with robust frameworks for financial consumer protection, and financial and digital literacy.**

A key priority looking toward 2030 is to ensure that financial services build resilience and result in positive development outcomes. New approaches need to reach the nearly 30% of adults in developing economies who remain unbanked, including heightened focus on savings and insurance products.

As global efforts to achieve the SDGs continue, I encourage everyone to widely share this important compendium, and for governments, businesses, and civil society to put it to use. The solutions presented here not only inspire, but also help inform policies that lead people out of poverty and support more resilient and sustainable livelihoods.

H.M. Queen Máxima of the Netherlands
United Nations Secretary General's Special Advocate for
Inclusive Finance for Development (UNSGSA)

Introduction

Digital financial services offer real hope to help the world get back on track to achieve the Sustainable Development Goals[1] (SDGs) by 2030.

New evidence demonstrates how responsible digital financial inclusion creates the foundation for inclusive growing economies. Building on the success of the first compendium, *Igniting SDG progress through digital financial inclusion*,[2] released in 2018, this new version takes a stronger focus on women and climate change across all SDGs.

Pressing global challenges—crucially, the lingering effects of the COVID-19 pandemic, unpredictable climate shocks, protracted international conflicts, high inflation and rising food insecurity—continue to adversely impact emerging economies. Women are worst hit. Nearly 400 million[3] women and girls are expected to be living in extreme poverty by the end of this year. Over the past decade, 80%[4] of the 250 million[5] people forcibly displaced by natural disasters in emerging economies were women. Yet they have less access to technology and productive resources, and have less capacity to adapt their livelihoods.

Digitial financial services can enable financing for billions of people facing emergencies, such as health crises, natural disasters and conflict. The digitization of public sector wages and social protection schemes in recent years, especially during the pandemic, prompted millions of previously unbanked women to open accounts. Nearly 70% of women in emerging economies have an account—a rise of more than 30 percentage points over the past decade, according to the recently released World Bank Global Findex.[6]

If you are a leader in government, business, or civil society, this compendium will give you plenty of good reasons to make responsible[7] digital financial inclusion a priority. You will find extensive evidence-based examples for each of the 13 SDGs relevant to the wide benefits of inclusive digital financial services, including:

- In **Uganda**'s northern region, the use of mobile money accounts for households in rural areas raised food security by 45% (SDG 2).
- In **India,** a government workfare program reaching over 100 million people found that paying women benefits directly into their own financial institution account increased women's financial control, and incentivized them to find employment, compared to those paid in cash (SDG 5).
- In **Tanzania,** water payment digitization dramatically cut average water-collection waiting times, from three hours to 10 minutes, benefiting women who are usually in charge of water collection by allowing them to pursue more productive activities (SDG 6).
- In **Kenya,** using a digital mobile platform, 1.3 million farmers greatly raised their profits in 2021, and were able to build their capacity to weather external shocks (SDG 13).
- In **Mexico,** digitizing tax payments raised overall tax revenue and social security contributions by about 95%, to almost $140 billion between 2010 and 2016 (SDG 16).

Digital financial inclusion, when done responsibly, not only drives growth, but also advances the Sustainable Development Goals, helping reach financial equality for women.

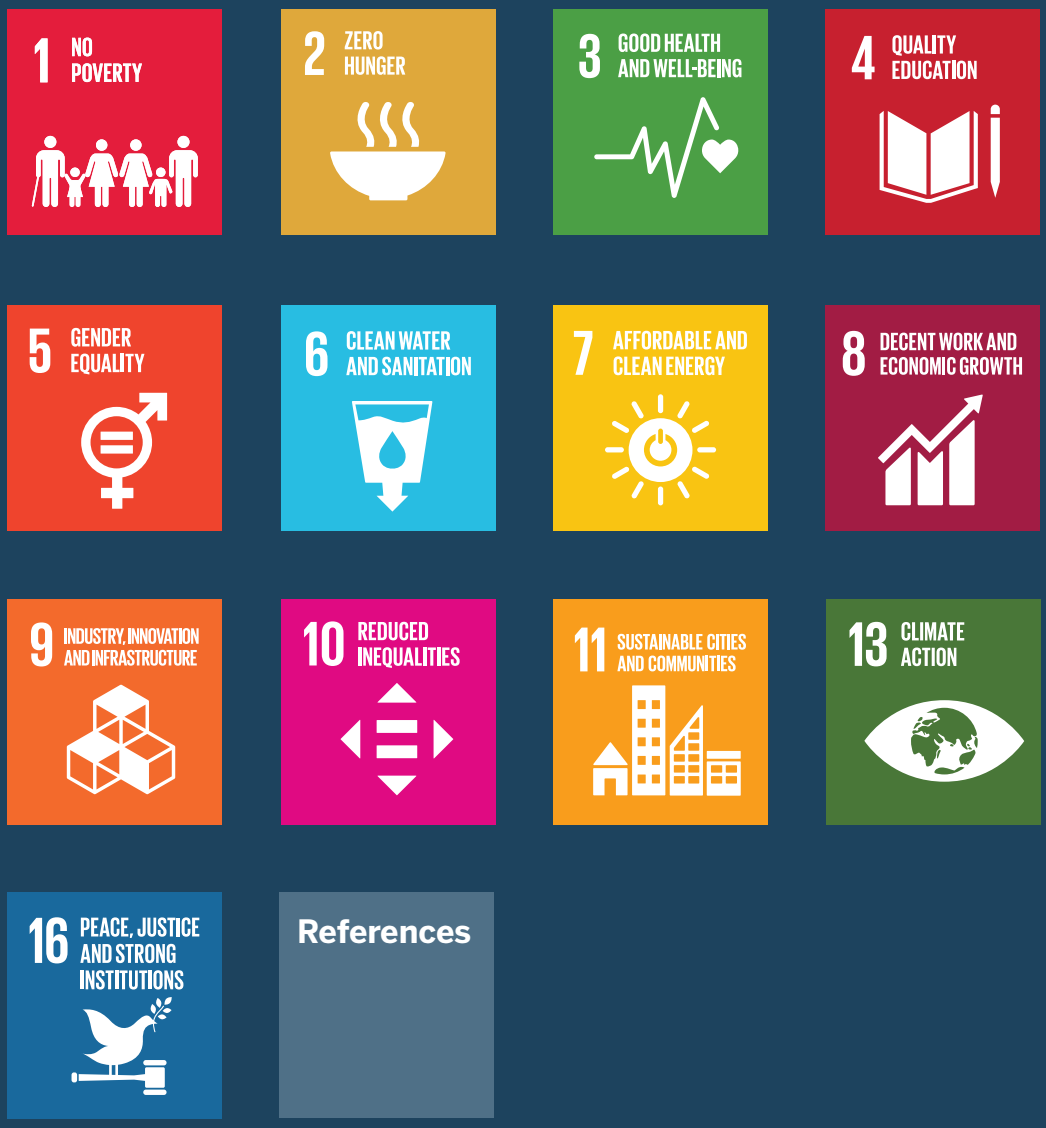
This compendium is a collaboration between the Office of the United Nations Secretary-General's Special Advocate for Inclusive Finance for Development (Her Majesty Queen Máxima of the Netherlands), the United Nations-based Better Than Cash Alliance, the United Nations Capital Development Fund, the Consultative Group to Assist the Poor (CGAP) and the World Bank.

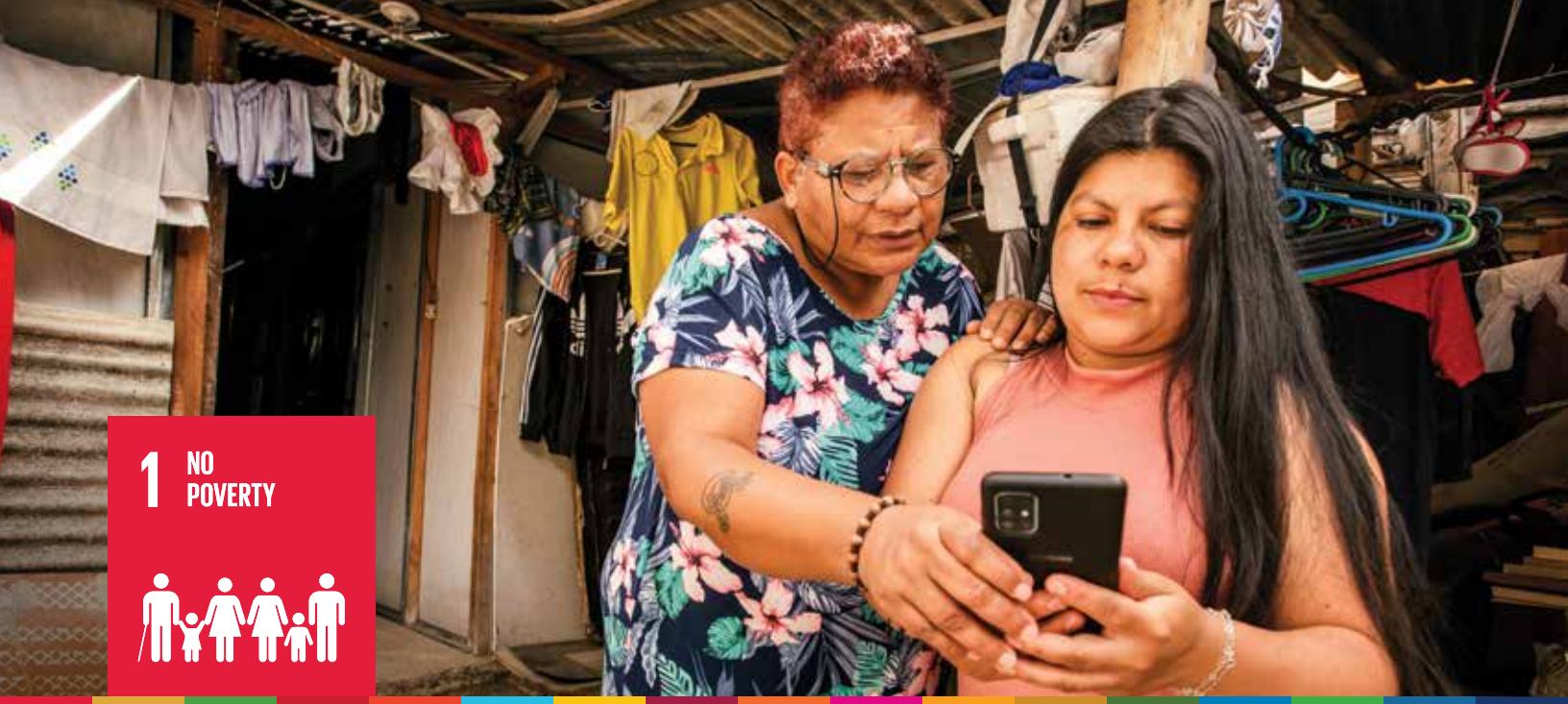
1. United Nations, DESA. **2.** UNSGSA, BTCA, WBG, 2018. **3.** UN Women, 2022. **4.** United Nations, 2021. **5.** UNDRR database. **6.** World Bank, 2021. **7.** BTCA, 2021.

Contents

Digital financial inclusion aligned with the SDGs

Click/tap a numbered tile to go to that SDG-aligned section





February 2023

Ending poverty through DIGITAL FINANCIAL INCLUSION

Global conflict, the lingering effects of the COVID-19 pandemic, and climate shocks are causing increases in extreme poverty not seen in 25 years. Compared with pre-pandemic projections, 75 million more people were living in extreme poverty by the end of 2022.[1]* As of 2022, almost 388 million women and girls were living in extreme poverty.[2]

OPPORTUNITY

Digital financial services have become a critical lifeline for billions of people facing emergencies (health, natural disasters, conflict), and can be designed to benefit women in particular, many of whom are underserved. During the pandemic, digital public infrastructure[3] enabled the rapid expansion of social safety net programs for low-income households, promoted access to health services, and facilitated emergency access to credit for small businesses.[4]

* Extreme poverty is defined at the threshold of $1.90 a day.[5]

CHALLENGES

- **Shocks, including illness, job loss, and natural disasters,** can negatively affect household consumption and prolong cycles of poverty.[6] Households can be exposed to multiple shocks at once, exacerbating negative impacts on health, access to basic services, and finance.[7]
- Many low-income households and small businesses face irregular income streams. Without access to financial services, they **can struggle to build up savings and expand income-generating activities.** This can be more pronounced for women, given that they often work in the informal sector and can face complex social norms restricting economic opportunities.[9]
- **One-third of adults in sub-Saharan Africa, totaling more than 360 million people, do not use accounts to send or receive domestic remittances.** Without accounts, they are less likely to use domestic remittances to build up savings buffers and make productive investments.[12]

SOLUTIONS

- Digital financial services help the most vulnerable populations to **smooth cash flows and build resilience** in response to shocks, including through digital payments, savings, insurance, and social protections.[8]
- Social protection payments and domestic remittances received through mobile money can help to generate stable income streams, with positive impacts on consumption and welfare for vulnerable households.[10] **Greater access to funds means improved bargaining power for women in the household.**[11]
- Digital payments facilitate more efficient and transparent money management, as they **make sending and receiving remittances easier**, and create more investment opportunities for individuals.[13]

Photo: Communication for Development Ltd

Ending poverty through
DIGITAL FINANCIAL INCLUSION

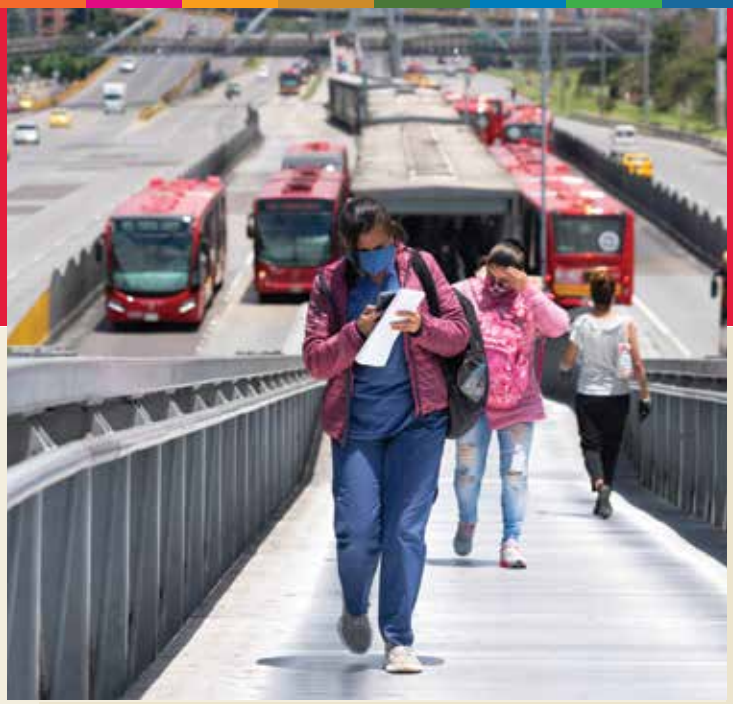


Photo: © Shutterstock

BRAZIL

The COVID-19 emergency program supported micro-entrepreneurs, informal workers, and unemployed citizens by setting up digital savings accounts. It reached 68.2 million participants, including 5 million micro-businesses.[14] Further, Bolsa Familia, the largest social protection program in the world, has been found to have a positive impact on the local formal labor market and the overall economy.[15]

COLOMBIA

The COVID-19 emergency program, Ingreso Solidario, provided rapid income support to low-income and vulnerable households via bank accounts and mobile wallets. By April 2021, the program had reached **4 million households—over 64% of them women-headed.**[16]

MOZAMBIQUE

Following a flood shock, mobile money improved welfare by allowing rural villagers to increase consumption expenditure by 47.7% in one year compared with non-users.[17]

KENYA

The spread of mobile money **lifted 1 million households out of extreme poverty** from 2008 to 2014—the equivalent of 2% of the population.[18]

UGANDA

Mobile money contributed to higher household incomes and consumption levels for coffee farmers, while facilitating transactions with new buyers in high-value markets rather than selling to only local traders.[19]

1. World Bank Group, 2022. **2.** UN Women, 2022. **3.** Per the Digital Public Goods Alliance, digital public infrastructure refers to solutions and systems that enable the effective provision of essential society-wide functions and services in the public and private sectors. These include data exchange, interoperable payment infrastructure, and digital identification. **4.** Task Force on Digital Financing of the Sustainable Development Goals, 2020. **5.** World Bank Group, 2022. **6.** Arbelaez et al., 2019. **7.** Heltberg, Oviedo, and Talukdar, 2014. **8.** Venkatesan and Stark, 2022. **9.** CGAP, 2020 and 2021. **10.** Jack and Suri, 2016. **11.** Aker et al., 2016. **12.** World Bank Group, 2021. **13.** Bill & Melinda Gates Foundation, 2021. **14.** International Finance Corporation and SME Finance Forum, 2021. **15.** Gerard, 2021. **16.** BTCA, 2022. Ingreso Solidario Website **17.** Batista and Vicente, 2022. **18.** Jack and Suri, 2016. **19.** Sekabira and Qaim, 2017.

UNSGSA · BETTER THAN CASH ALLIANCE · UNCDF Impact Capital for Development · CGAP · WORLD BANK GROUP

February 2023

Helping eliminate hunger through DIGITAL FINANCIAL INCLUSION

In 2020, just under 2.4 billion people were without food or unable to eat a consistently healthy, balanced diet.[1] The food system is under increasing stress due to climate change and conflict. Women are more likely than men to report food insecurity in almost two-thirds of countries worldwide.[2]

OPPORTUNITY

Digital innovation offers new opportunities for smallholder farmers to access more productive agricultural inputs, connect to new markets and value chains, and use financial products to improve productivity and bolster resilience to shocks.[3] As well as being highly reliant on their own agricultural produce for their food and nutrition security,[4] smallholder farmers play a critical role by producing 35% of the global food supply.[5]

CHALLENGES

- A cash-based agricultural value chain creates information asymmetries between smallholder farmers and markets, resulting in **higher costs, less income for crops, and higher risks for farmers**.[6]
- The **visible impacts of climate change**—including extreme weather, higher temperatures, desertification, salinization, and the loss of biodiversity—pose significant risks to food security.[8]
- Food insecurity and malnutrition in all their forms are made worse by high and persistent levels of **inequality, including in access to information and technology**.[10]
- Women's financial exclusion can be in part due to the **restrictive social norms** that give them less access to assets and less decision-making authority than men.[12] These social norms can negatively affect food consumption and diet within households.[13]

SOLUTIONS

- Digital financial services **improve the efficiency and transparency of agricultural value chains.** Farmers benefit through less-expensive inputs and greater market access. Digital financial services can also reduce farmer dependency on intermediaries and shorten transaction times.[7]
- Index-based agricultural insurance, which offers payouts based on external weather indicators, gives a **buffer against climate change shocks.** It thereby improves food security, particularly for rural smallholder farmers.[9]
- The digital delivery of social protection can positively impact **diet diversity and help to address food insecurity** for the undernourished, particularly in low-income and rural communities.[11]
- Digital financial services promote women's empowerment, economic participation, and food security. Women with bank accounts are more likely to have **greater bargaining power** and to allocate more household resources to buying nutritious food.[14]

Photo: Communication for Development Ltd

Helping eliminate hunger through

DIGITAL FINANCIAL INCLUSION

Photo: Communication for Development Ltd

BANGLADESH

Households who received mobile money transfers ahead of peak flooding as part of a government emergency program were 36% less likely to go a day without eating.[15]

UGANDA

The use of mobile money accounts **increased food security by 45% for rural households** in a year. It also led to cost savings for remittance transactions, and cut the share of households with very low food security.[16]

BURKINA FASO AND SENEGAL

Women who bought index-based agricultural insurance had higher average yields and were better able to manage food insecurity and income shocks.[17]

CÔTE D'IVOIRE

In 2017, nearly 14,000 cocoa farmers saved around $600,000 using mobile savings wallets. They were 50% less likely to have trouble feeding their families.[18, 19]

LEBANON

Digital transfers to 87,000 Syrian refugees via cards increased food and water expenditure by $25 per month relative to non-recipients. **Each dollar that recipients spent generated $2.13 of GDP for the Lebanese economy**.[20]

KENYA

The use of mobile money helped farmers to overcome market access barriers. They were able to buy more inputs such as fertilizer, pesticides, and hired labor, and so had higher harvest sales.[21]

1. United Nations, 2021 **2.** UN Women. **3.** EY, 2020. **4.** FAO, 2018. **5.** Lowder et al., 2021. **6.** Asia-Pacific Economic Cooperation, 2017. **7.** Lopez, 2019. **8.** FAO, 2021. **9.** USAID, 2018. **10.** FAO, 2021. **11.** Aker et al., 2016. **12.** CGAP, 2021. **13.** Kumaraswamy and Bin-Humam, 2019. **14.** Schroeder, 2020. **15.** Pople et al., 2021. **16.** Weiser et al., 2019. **17.** Delavallade et al., 2015. **18.** Lonie et al., 2018. **19.** IFC, 2019. **20.** Lehman and Masterson, 2014. **21.** Kikulwe, Fischer, and Qaim, 2014.

UNSGSA · BETTER THAN CASH ALLIANCE · UNCDF Impact Capital for Development · CGAP · WORLD BANK GROUP

February 2023

Better health through DIGITAL FINANCIAL INCLUSION

Health-care costs due to COVID-19 pushed more than half a billion people into extreme poverty.[1] Around 100 million people, mainly with low income and largely uninsured, fall into poverty each year due to health shocks and stresses. The impact of climate change is making the trend worse: it is anticipated to add about 250,000 more deaths annually between 2030 and 2050.[2]

OPPORTUNITY

Digital financial services can improve the speed and efficiency of health wage payments,[3] the reach and effectiveness of health services, and the monitoring and management of health programs. They also enable individuals, safely and affordably, to store, send, and receive money in planning for emergencies, and in making productive investments or savings for the future, such as in health.[4] Wage digitization could be particularly beneficial for women, since the majority of lower-level health workers at the front line in many emerging economies are women.[5]

CHALLENGES

- About 50% of adults in emerging economies were very worried about covering health expenses in the event of a major illness or accident, and **36% said health-care costs were their biggest worry.**[6]
- **A shortage of health workers,** especially in rural and remote areas, makes it harder to deliver effective and affordable health services. **Delayed wage payments** have been one of the concerns for health workers on strike. They may also lead health workers to solicit informal payments from patients.[10]
- While gender disparities in mobile phone ownership have narrowed over time, **women continue to be less able to access critical health-care information** from the government and health-care providers.[15]

SOLUTIONS

- Digital financial services make individuals and households less vulnerable to catastrophic health-care expenditures.[7,8] When compared with non-users, between 2013 and 2016, **mobile money holders in Kenya spent 98% more per capita on health care,** were 50% more likely to buy medication, and used more formal health-care facilities.[9]
- Reliable payment processes improve worker morale, performance, hours worked, and retention, which may lead to improvements in the delivery of high-quality health services.[11,12] Wage digitization also reduces costs, and improves transparency and program governance.[13] For instance, **digitizing 50% of employee payments has the potential to boost Senegal's economy by $84 million each year**.[14]
- Digital financial services, such as receiving remittances through mobile money, can improve health-care access and delivery. In Uganda, for instance, women who used mobile money were **more likely to seek prenatal care**, improving health outcomes for both mother and child.[16]

Photo: Communication for Development Ltd

Better health through
DIGITAL FINANCIAL INCLUSION

Photo: Communication for Development Ltd

KENYA

M-TIBA, a health-care financing platform, onboarded 4.7 million users and over 3,000 health-care providers between 2016 and 2021. Every year, the platform manages more than 1 million treatment claims.[18] Almost all of the 4,354 surveyed users—93%—reported that the mobile-enabled services resulted in greater control, access to quality health care, and a better payment process.[19]

NEPAL

Women who opened no-fee savings accounts **increased household spending on education and nutritious foods,** and their daughters stayed in school. They also **invested more in preventive health care,** thereby improving resilience to health shocks.[20]

SENEGAL

The integrated management information system for universal health coverage, digitized enrollment and premium payments, resulted in reduced per user enrollment costs from $4.70 to $2.40 and enrolled 2.8 million people between 2019 and late 2020.[21]

SIERRA LEONE

Shifting to digital payments at the height of the Ebola crisis from 2014 to 2016 helped **critical health workers to receive their pay quicker, reducing the payment time from over a month to around one week.** This eliminated worker strikes and secured the Ebola response workforce that saved countless lives.[26]

CÔTE D'IVOIRE

Surveys showed that eight in 10 polio vaccinators preferred mobile money over cash, citing convenience, speed of receiving funds, and security as the top three benefits. Most vaccinators were able to get paid within a half hour.[22]

TANZANIA

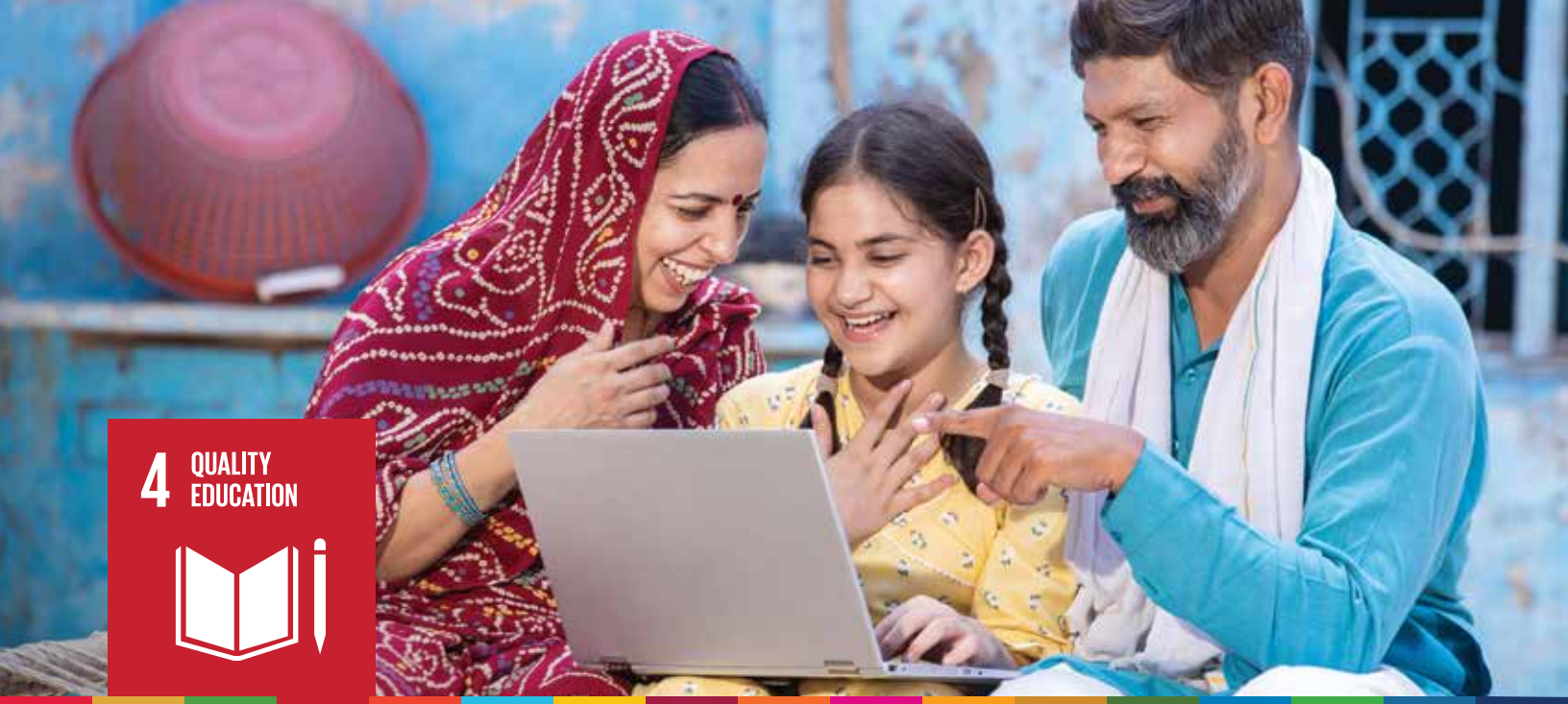
Jammi, a mobile micro-health insurance product, reduced insurance administration costs by 95% and enabled access to cheap insurance, starting at $1 a month via USSD.[23,24]

KENYA

The Mobile Alliance for Maternal Action used mobile money to pay incentives to health workers, enabling faster payment delivery, within 11 to 30 days as opposed to 41 days.[25]

1. WHO, 2021. **2.** Ibid. **3.** BTCA, 2020 **4.** USAID, 2018 **5.** McConnell et al., 2022. **6.** World Bank, 2021. **7.** USAID, 2018. **8.** Pazarbasioglu et al., 2020 **9.** Ahmed and Cowan, 2021. **10.** Data points from 2009–2018 across a group of 31 low-income countries (Salama, McIsaac, and Campbell, 2019; McConnell et al., 2022). **11.** Russo et al., 2019. **12.** McConnell et al., 2022. **13.** USAID, 2018. **14.** Chaintreau, Mvondo, and Annoussamy 2021. **15.** GSMA, 2020. **16.** Egami and Matsumoto, 2020. **17.** AFI, 2021. **18.** Nationally representative survey in August 2020 on mobile services used for health care (CarePay and Ajua, 2020). **19.** Prina, 2015. **20.** BTCA, 2021a. **21.** In Côte d'Ivoire, 382 vaccinators were surveyed (60 Decibels, 2021a); in Liberia, 464 were surveyed (60 Decibels, 2021b); McConnell et al., 2022. **22.** Peverelli and de Feniks, 2017. **23.** Signé, 2021. **24.** BTCA, 2021b. **25.** Bangura, 2016.

UNSGSA · BETTER THAN CASH ALLIANCE · UNCDF Impact Capital for Development · CGAP · WORLD BANK GROUP



4 QUALITY EDUCATION

February 2023

Delivering quality education through DIGITAL FINANCIAL INCLUSION

Since the onset of the COVID-19 pandemic, schoolchildren's in-person learning has suffered a loss of at least 1.8 trillion hours globally.[1] One billion children, or roughly half of the 2.2 billion worldwide, live in one of the 33 countries regarded as at extremely high risk. This makes them more vulnerable to the effects of climate change and risks their health, education, and safety.[2] Added to this, less than 40% of countries give girls equal access to education.[3]

OPPORTUNITY

Digital financial services can make education more affordable through tools to finance educational expenditure, and can improve the speed and efficiency of delivering wages to teachers.[4] They also allow children to stay in school longer when a shock hits, through the resilience given by savings and insurance products.[5]

CHALLENGES

- **258 million children and young people lack access to education.** Poverty is the main obstacle to access.[6]
- When **teacher salaries and benefits are not paid on time,** it has a detrimental effect on educational quality and examination performance.[8]
- **Less than 40% of countries give girls equal access to education.**[10] It is evident that keeping girls in school reduces gender-based violence, child marriage, and early pregnancy.[11]

SOLUTIONS

- By **lowering costs and improving convenience,** digital savings, loans, and remittance products make it possible to accumulate funds for educational costs. Students may buy additional study materials through digital financial services in conjunction with e-learning platforms, such as pay-as-you-go fee plans. This reinforces classroom lessons while keeping the resources affordable.[7]
- Digital salary and per diem payments **save time and expense for teachers,** potentially reducing their absenteeism and improving their satisfaction.[9]
- When **women are empowered to have a say in household spending decisions,** they choose to invest in education, safe housing, and health care. These investments have an especially positive impact on women and children.[12] Education subsidies (G2P) delivered directly to mothers' mobile money accounts have also shown positive effects.[13,14]

Photo: © Shutterstock

Delivering quality education through

DIGITAL FINANCIAL INCLUSION

Photo: Sarah Farhat / World Bank

BANGLADESH

The direct transfer of educational stipends cut the administrative burden on teachers and lowered the risk of mismanagement allegations against school staff. Almost all—96%—of 25 school principals surveyed preferred transfers using mobile payments.[15]

UGANDA

By providing digital school fee loans to solar home system borrowers, ENGIE Energy Access's ReadyPay program resulted in a **50% drop in the number of children who were not enrolled** in school, and a 36% increase in spending on education-related costs, such as school fees, supplies (uniforms, pens, pencils, notebooks, etc.), transportation, and school meals.[16]

EAST AFRICA

Kupaa, a digital school management platform, allows parents to pay school fees in installments, and schools to track payments and expenses. As of October 2019, 270,000 students were registered across more than 500 schools in Uganda.[17, 18, 19]

LIBERIA

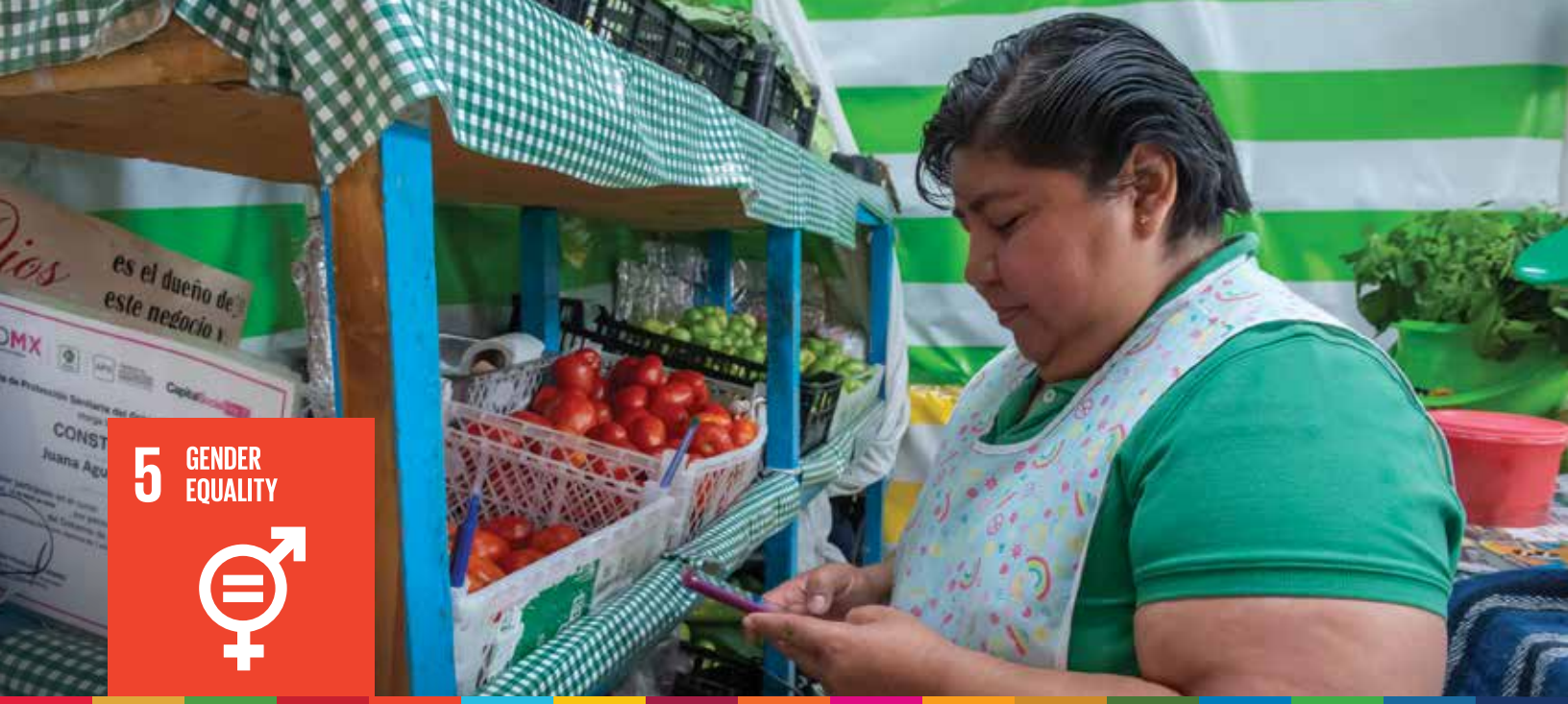
Digitizing teachers' wage payments resulted in a **92% decline in the cost of salary collection, from $25 per paycheck to $2.** Since they did not have to commute to collect their wages, teachers saved money on transportation and spent more time in classrooms.[20]

CÔTE D'IVOIRE, GHANA, KENYA and RWANDA

Through partnerships with mobile money providers, Eneza Foundation has enabled affordable access to digital educational content, especially for vulnerable and remote populations.[21] By December 2021, the mobile education platform had reached 11.1 million people with over 2.5 billion messages exchanged on its SMS platform.[22, 23]

1. UNICEF, 2021a. **2.** UNICEF, 2021b. **3.** UNGEI, 2018. **4.** Ibid. **5.** USAID, 2018. **6.** UNESCO, 2020. **7.** USAID, 2018. **8.** Katete and Nyangarika, 2020. **9.** Ibid. **10.** UNGEI, 2018. **11.** Rasmussen and Mattern, 2022. **12.** Ibid. **13.** Gelb et al., 2019. **14.** Ministry of Education, Colombia, 2018. **15.** Gelb et al., 2019. **16.** Mattern and Garcia, 2021. **17.** Rasmussen and Mattern, 2022. **18.** Mastercard Center for Inclusive Growth, 2019. **19.** Miebach, 2019. **20.** Dusza, 2016. **21.** GSMA, 2020. **23.** Rohatgi and Galdava, 2018. **24.** Eneza Education, 2021.

UNSGSA · BETTER THAN CASH ALLIANCE · UNCDF Impact Capital for Development · CGAP · WORLD BANK GROUP



February 2023

Advancing women's economic empowerment through DIGITAL FINANCIAL INCLUSION

The COVID-19 pandemic disproportionately affected women-owned firms for multiple reasons, including that women took on more caretaking responsibilities, and their businesses had less public support than those run by men.[1,2] A lack of access to finance can put women and their businesses at risk of being excluded from economic recovery. About 740 million women do not have an account.[3] Yet, financial services for women strengthen their economic empowerment and financial independence, and have multiplier effects for future generations of women.

OPPORTUNITY

Lower costs and more powerful distribution channels through digital technologies make the design of women-centered digital financial products viable. These include payments, savings accounts, and credit, creating inclusive market opportunities.

CHALLENGES

- Although there has been progress, **women in emerging economies are still six percentage points less likely than men to own an account**.[4]
- Financial exclusion prevents women from building traditional credit histories and scores, further undermining their access to credit. Across regions, women-led enterprises have lower access to finance, and pay higher rates for it.[8] **In low- and middle-income countries, women-led businesses face a $1.3 trillion financing gap**.[9]
- Inexperienced account owners who need the help of a family member or banking agent may be **more vulnerable to financial abuse**. In sub-Saharan Africa, women are nine percentage points more likely than men to need help using their mobile money accounts.[16]
- The **lack of gender-disaggregated data** hinders our ability to clearly define and scope the problem, and prevents us from making the issue visible for decision-makers.

SOLUTIONS

- In emerging economies, **37% of women opened their first account at a financial institution to receive a wage payment or money from the government.**[5] Access to digital identification[6] and mobile phones[7] can enable digitizing of payments.
- **Financial education and clear product terms are important** for women with limited financial experience and capability. Classroom-based financial education and ongoing financial training may encourage 'learning-by-doing' and lead to regular account use and savvier customers.[10–15]
- **Digital channels help** with the collection of data to understand the social norms and constraints faced by women.[17]

Photo: © Better Than Cash Alliance

Advancing women's economic empowerment through

DIGITAL FINANCIAL INCLUSION

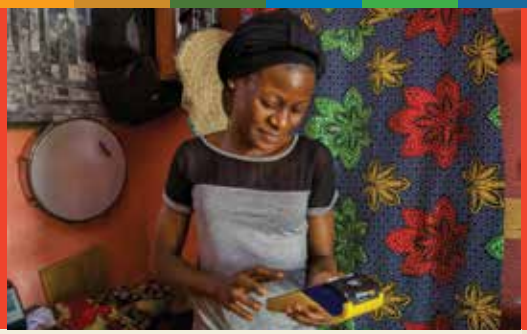


Photo: Communication for Development Ltd

BANGLADESH

Workers in the garment sector, majority of whom are women, who received wages directly into an account increased savings and their ability to meet unexpected expenses, such as a family emergency, and also learned to use the account without assistance, were able to use a wider set of account features, and learned to avoid illicit fees.[18, 19]

CHILE

Low-income women members of microfinance institutions who received free savings accounts were able to reduce their reliance on debt and to improve their ability to make ends meet during an economic emergency.[20]

INDIA

A government workfare program that reached over 100 million people found that **paying women benefits directly into their own financial institution account**—not into the account of a male household head—**increased women's financial control, and incentivized them to find employment** compared with those paid in cash.[21]

NIGER

Digitizing social transfers into women's accounts shifted the spending toward the items women prioritized, such as for more dietary diversity, which was 9–16% higher compared with the control group. This shift persisted after the program ended, indicating an increase in household bargaining power for women.[22]

KENYA

When zero-interest savings accounts were offered to male and female entrepreneurs, women used them far more than men, and increased their business investment by 38% more than the control group.[23]

DOMINICAN REPUBLIC

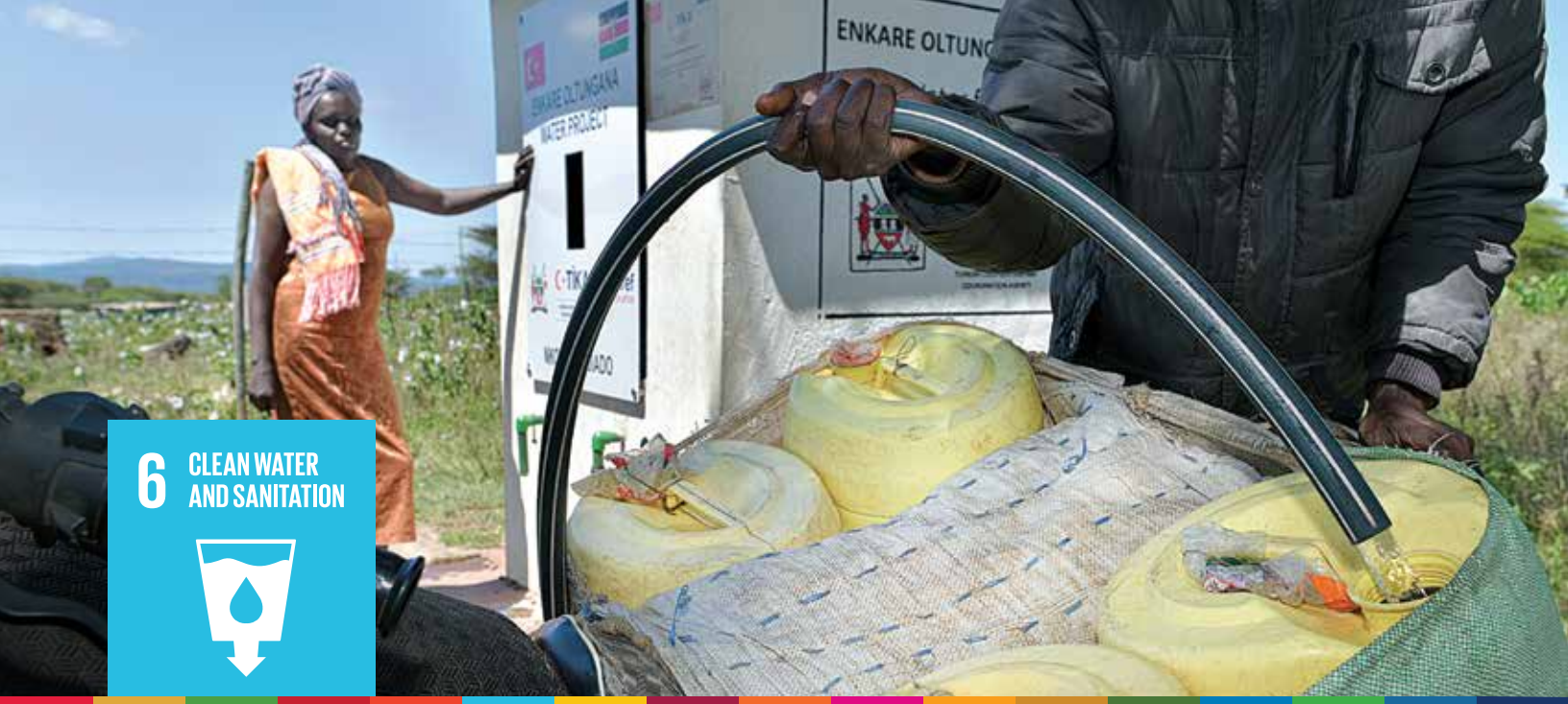
Preliminary findings indicate that using a gender-differentiated approach, with different credit-scoring algorithms for women and men, could lead to **80% more women having a higher credit score** than they would under a traditional model.[24, 25]

PHILIPPINES

With mobile banking, microfinance members spent 70% less time on withdrawals, saving about 42 minutes per withdrawal, majority of the sample members were women.[26, 27]

1. Torres et al., 2021. **2.** World Bank, no date. **3.** Demirgüç-Kunt et al., 2022. **4.** Ibid. **5.** Ibid. **6.** World Bank, 2021. **7.** GSMA, 2022. **8.** WeFi, 2022. **9.** Dalal, Gomez, and Patel, 2022. **10.** Bruhn, Ibarra, and McKenzie, 2014. **11.** Bruhn et al., 2016. **12.** Doi, McKenzie, and Zia, 2014. **13.** Fernandes, Lynch, and Netemeyer, 2014. **14.** Breza, Kanz, and Klapper, 2020. **15.** Lee et al., 2021. **16.** Demirgüç-Kunt et al., 2022. **17.** FinEQUITY, 2020. **18.** HERproject, 2020. **19.** Breza et al., 2020. **20.** Kast, Meier, and Pomeranz, 2018. **21.** Field et al., 2021. **22.** Aker et al., 2016. **23.** Dupas and Robinson, 2013. **24.** Financial Alliance for Women, 2020. **25.** Robinson, Park, and Blumenstock, 2022. **26.** Bill & Melinda Gates Foundation, 2021. **27.** Harigaya, 2020.

UNSGSA · BETTER THAN CASH ALLIANCE · UNCDF Impact Capital for Development · CGAP · WORLD BANK GROUP



February 2023

Improving access to water and sanitation through DIGITAL FINANCIAL INCLUSION

Globally, 2 billion people lack consistent access to clean drinking water, and 3.6 billion have no access to basic sanitation facilities, resulting in 1 million preventable deaths each year.[1, 2, 3] Over 355 million women and girls had no access to basic sanitation in 2017.[4] For communities living with very low incomes, reliable water supplies help them to withstand climate change, such as longer dry seasons and flooding.[5]

OPPORTUNITY

Digital financial services can make safe drinking water and basic sanitation facilities more affordable and locally accessible. Local access frees up time for women, who are usually in charge of water collection, allowing them to pursue more productive activities. It can also prevent the spread of waterborne and hygiene-related diseases and deaths.[6,7,8]

CHALLENGES

- Water and sanitation providers that want to reach rural customers with affordable water and sanitation services face **high operating costs**. This limits their ability to expand services to people with low incomes and makes these services prohibitively expensive to access.[9,10]
- Women are responsible for collecting water in 80% of low-income households, and African women spend up to an hour[13] collecting water each day. The **time burden for water collection is increasing[14] due to climate change**, as droughts create water shortages and floods result in water contamination, forcing women to walk further to find safe water sources.[15,16,17]
- Poor water and sanitation conditions are directly linked to the **1.7 billion annual cases of diarrhea in small children,** 3 million cases of cholera, and 11 million cases of typhoid fever.[19]

SOLUTIONS

- Digital payments **reduced revenue-collection costs by up to 95%** for water and sanitation providers in Ghana. This can make water and sanitation services more affordable.[11,12]
- Digitally enabled micro-loans, savings, and pay-as-you-go products can make **safe and sustainable water and sanitation services accessible to women** in low-income households. Local access frees up time for productive activities and improves women's economic empowerment outcomes.[18]
- Digital wallets can make it **easier to save and to pay** for water and sanitation services, allowing low-income and vulnerable people to live in more hygienic conditions.[20]

Photo: Communication for Development Ltd

Improving access to water and sanitation through
DIGITAL FINANCIAL INCLUSION

Photo: Communication for Development Ltd

BANGLADESH, CAMBODIA, INDIA, LAO PEOPLE'S DEMOCRATIVE REPUBLIC

After switching from cash to prepaid cards, Drinkwell—which has provided safe drinking water to over 250,000 people through 200 water ATMs—reported **a significant drop in the cost of collecting payments, from 20% to 2% of revenue**.[21,22]

MADAGASCAR

Container toilet company Loowatt cut its operating expenses by 20% when it shifted from cash to digital collections. It passed on these savings to customers, making sanitation services more affordable. Loowatt is expanding from 520 to 1,100 home toilets in Antananarivo.[23,24]

KENYA

Sanergy makes low-cost portable sanitation facilities and sells them through a franchise model, in which residents can pay the small subscription fee to local franchisees/entrepreneurs through a digital wallet. More than 127,000 people living in urban areas with low incomes now have access to hygienic sanitation systems using this model.[25,26]

WORLDWIDE/ BANGLADESH

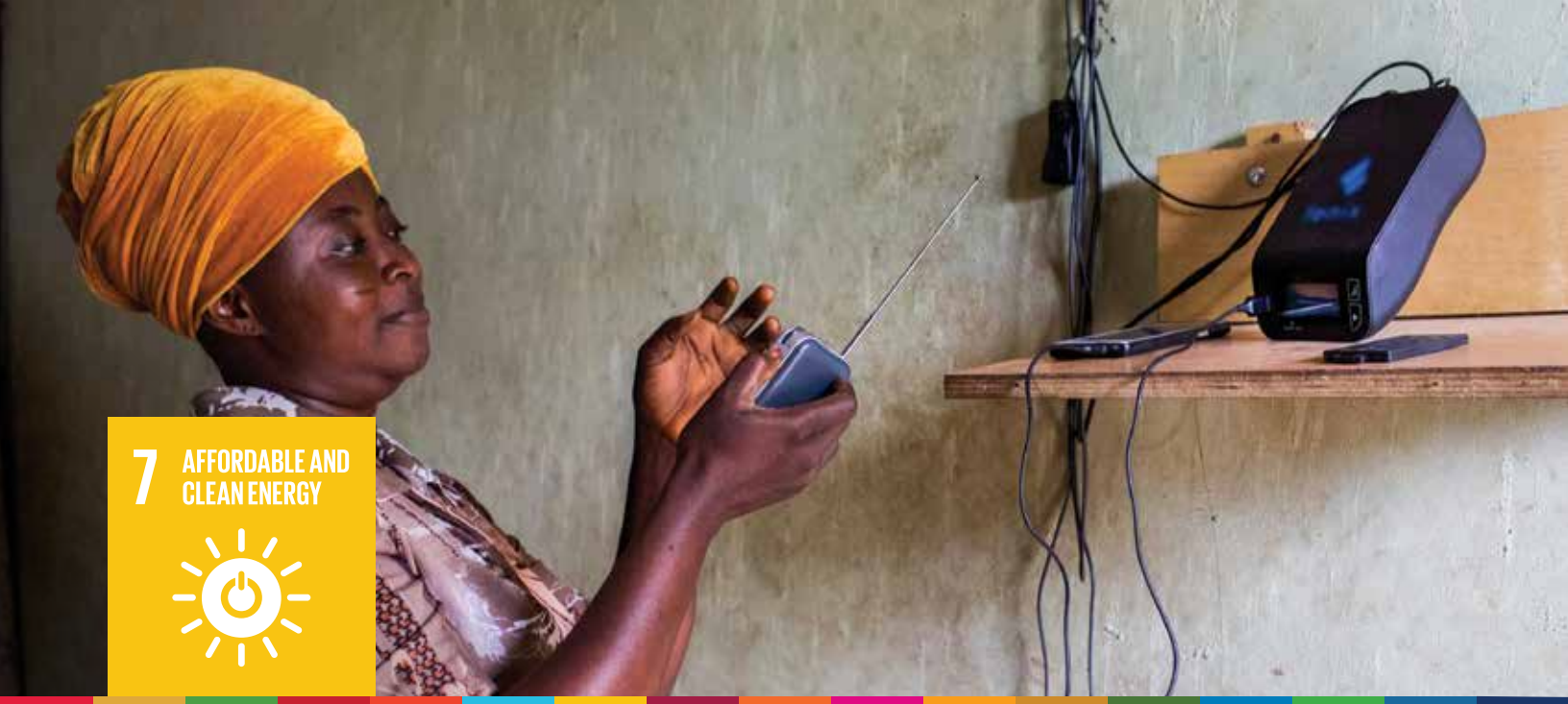
According to the Global Findex, nearly 9% of individuals in low-income countries used mobile phones to make utility payments in 2021, up from 3% in 2017. In Bangladesh, the proportion of adults who made a utility payment through a financial account went up from 11% to 25% between 2017 and 2021.[27]

TANZANIA

A water payment digitization project resulted in a tripling of water utility payments, and a **reduction in the average daily water-collection waiting time from 3 hours to 10 minutes,** benefiting women in particular.[28]

1. WHO, 2021. **2.** Ritchie and Rose, 2021. **3.** Water.org, 2022. **4.** Crowley, 2017. **5.** United Nations, 2019. **6.** IRC, 2021. **7.** UNICEF, 2016. **8.** OECD, 2021. **9.** Njoroge, 2021. **10.** Waldron et al., 2019. **11.** Morais and White, 2020. **12.** Njoroge, 2021. **13.** UNICEF, 2016. **14.** UNICEF, 2022. **15.** Ibid. **16.** WHO and UNICEF, 2017. **17.** UNICEF, 2016. **18.** IRC, 2021. **19.** CDC, 2020. **20.** Waldron and Sotiriou, 2018. **21.** Waldron et al., 2019. **22.** GSMA, 2019. **23.** Waldron et al., 2019. **24.** Njoroge, 2021. **25.** Mastercard, 2018. **26.** Sanergy, 2022. **27.** World Bank, 2021. **28.** Water.org, 2018.

UNSGSA · BETTER THAN CASH ALLIANCE · UNCDF Impact Capital for Development · CGAP · WORLD BANK GROUP



7 AFFORDABLE AND CLEAN ENERGY

February 2023

Affordable clean energy through DIGITAL FINANCIAL INCLUSION

Around 770 million people had no access to electricity in 2020,[1] with more than 60% of them (479 million people) living in the least-developed countries.[2] Globally, around 2.4 billion people still use solid fuels to cook.[3] Women and children, who spend more time closer to domestic hearths, have higher exposure risks.[4]

OPPORTUNITY

Digital payments and loans offer flexible, remote, and secure payment solutions for energy services for millions of people with prepaid metering solutions—not only for pay-as-you-go but also in the mini-grid[5] sector.[6,7] An estimated 27 million customers have access to energy through PayGo[8] systems.[9]

CHALLENGES

- The negative impact of COVID-19 on household incomes made basic energy services less affordable. An estimated **90 million people in Africa and Asia lost access to basic energy services during the pandemic**.[10]
- **Four out of five people in sub-Saharan Africa have no access to electricity**, a problem exacerbated by the pandemic.[12]
- **Girls and women in low-income households are disproportionately affected by energy poverty**. Women devote more time and effort than men to collecting and preparing wood and other household fuels, and are more susceptible to indoor air pollution, as they spend more time on housework. This also leaves them less time for productive activities.[14]

SOLUTIONS

- Digital payments are **cost-effective**, and models such as smart meters and pay-as-you-go combine digital bill payments and prepaid energy to lower the cost of energy access.[11]
- PayGo solar is enabling households to pay system costs over a longer time, providing **affordable solar power to over 8 million people in sub-Saharan Africa** between 2013 and 2018.[13]
- **Digital financial services enable customers to build transaction histories,** helping providers to underwrite loans and increase women's access to finance and basic services.[15]

Photo: © Dominic Sansoni / World Bank

Affordable clean energy through

DIGITAL FINANCIAL INCLUSION

Photo: Better Than Cash Alliance / Allan Gichigi

RWANDA

Launched in December 2016, the Instant Payment Notification hub—which connects multiple PayGo utility providers and mobile money providers—has processed notifications for over 1.5 million unique payment transactions. The hub has enabled clean energy access for up to 100,000 households and **cut the time taken to supply energy to customers, from over 2 hours to 3 minutes.**[16]

PAKISTAN, MALAWI AND OTHERS[17]

Angaza, a technology platform based on the PayGo model, has assisted over 5 million consumers in emerging markets to save over $100 million (as of 2020), by aiding their transition from kerosene to clean, renewable energy.[18]

TANZANIA

Access to PayGo solar lamps **increased the likelihood of a rural woman working outside the household by five percentage points.** This led to 40 minutes more paid work and 24 minutes more unpaid work per day.[19,20]

GHANA AND OTHERS[21]

As of March 2017, the Azuri PayGo solar home system provided 46.8 million hours of clean light and 15.3 million hours of mobile phone charging, avoiding 5,668 tonnes of CO_2 emissions.[22] According to surveys, the average customer saves up to $70 in the first year. Thirty-seven percent of Azuri customers spent their savings on school fees, 28% spent them on food and water, and 20% reinvested the money in their business.[23]

CÔTE D'IVOIRE, GHANA, MALI AND SENEGAL

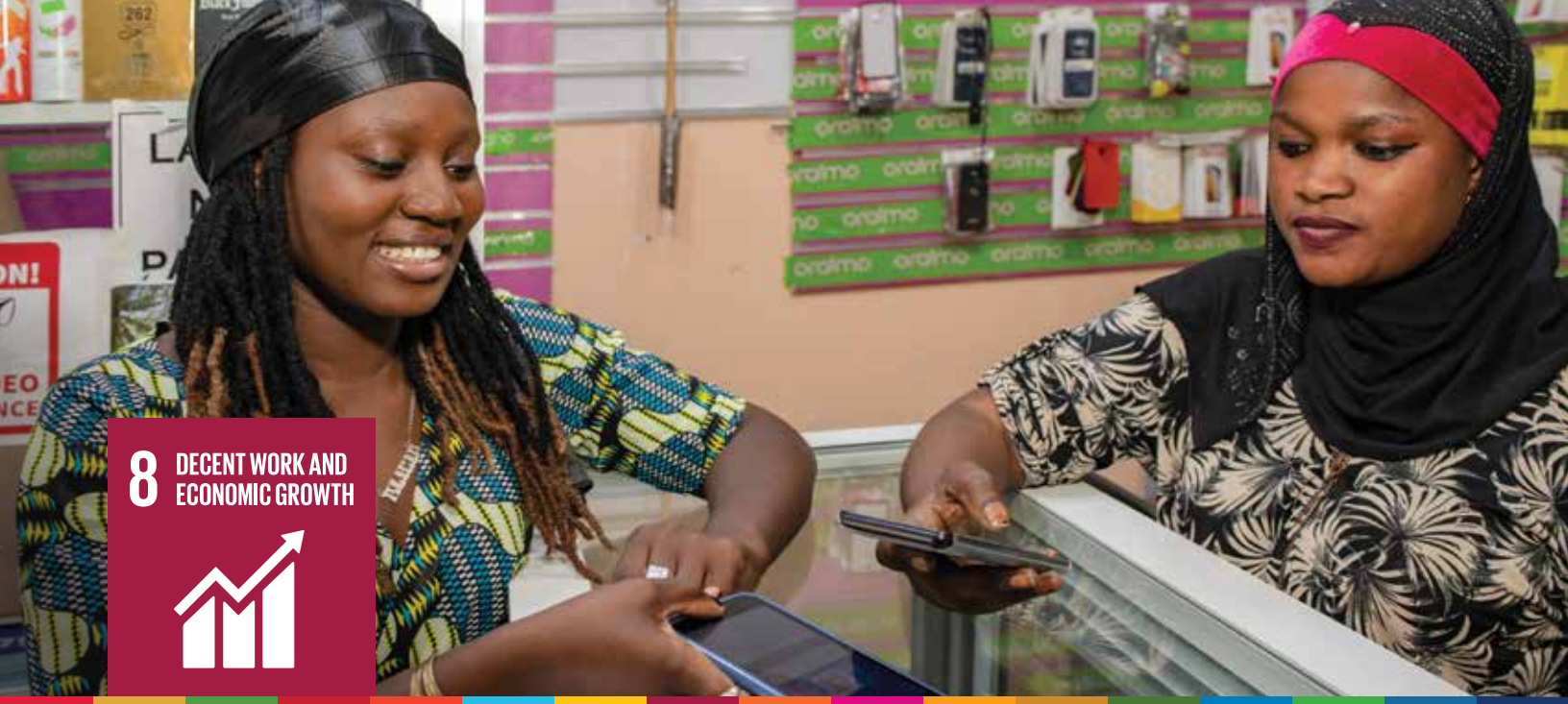
Reaching 700,000 people with its solar devices, PEG Africa helps customers to establish credit ratings and gain access to loans. In 2020, the sales from hundreds of pump installations surpassed $1 million.[24]

WORLDWIDE

There are 1.2 billion registered mobile money accounts[25] enabling new business models for affordable and clean energy companies. As of 2021, 30 million people are benefiting from a PayGo affordable modern energy products and services.[26]

1. IEA, 2022. **2.** IEA et al., 2021. **3.** WHO, 2022. **4.** Whiting, 2021. **5.** According to Energypedia, mini-grids are a set of electricity generators and possibly energy storage systems interconnected to a distribution network that supplies electricity to a localized group of customers. **6.** Waldron et al., 2018. **7.** Tellez et al., 2019. **8.** Pay-as-you-go (PayGo) is a system where costs are met as they arise, or services are paid for before they are used. New business models are emerging where mobile payments or other forms of digital payment are used to facilitate payment processing. **9.** Faz, Khaki and Mattern, 2021. **10.** United Nations, 2022. **11.** Waldron et al., 2018. **12.** Cozzi, Tonolo, and Wetzel, 2021. **13.** IRENA, 2020. **14.** Kumaraswamy, 2021. **15.** Ibid. **16.** GSMA, 2018. **17.** India, Kenya, Nicaragua, Sierra Leone, South Africa and Uganda **18.** IRENA, 2020. **19.** Aevarsdottir, Barton, and Bold, 2017. **20.** Kumaraswamy, 2021. **21.** Ethiopia, Kenya, Malawi, Rwanda, Sierra Leone, South Africa, Tanzania, Togo, Uganda, Zimbabwe **22.** UNFCCC, 2017. **23.** UNFCCC, no date. **24.** Jackson, 2021. **25.** GSMA, 2021. **26.** GOGLA, 2021.

UNSGSA · BETTER THAN CASH ALLIANCE · UNCDF Impact Capital for Development · CGAP · WORLD BANK GROUP



February 2023

More jobs and economic growth through DIGITAL FINANCIAL INCLUSION

To absorb the growing global workforce, 600 million new jobs[1,2] will be needed by 2030, and more than two-thirds of employment opportunities worldwide are provided by micro, small and medium-sized businesses (MSMEs).[3] Closing the finance gap of almost $5.2 trillion every year is especially pressing in emerging markets, where MSMEs account for 70% of job opportunities.[4]

OPPORTUNITY

Digital payments are a key enabler of financial inclusion by driving account ownership and usage, and reducing the gender gap.[5] Through wage digitization, workers can access value-added financial services to pay bills, make purchases, send money abroad, build a credit history, and save.[6] Women in particular are able to have more control over their earnings and more access to other financial services.[7] Digital payments can also contribute to a living income by providing more income transparency as well as with creation of data footprints.[8]

CHALLENGES

- Globally, about **165 million unbanked adults received private-sector wages in cash.**[9] This is inefficient for employers, and risky and disempowering for workers, particularly women workers.[10]
- Just over **50% of women participate in the labor force globally,** compared with 80% of men. Because they are less likely to work in the formal sector, they have fewer opportunities for business growth.[12]
- Despite many low-income workers in emerging markets incorporating platform work[15] into their livelihoods, **limited growth prospects persist**. A recent survey revealed that 45% believed they did not have access to the capital they needed to improve their skills and thus their income.[16]

SOLUTIONS

- Shifting from cash to digital wage payments has the potential to **improve payroll service efficiency, labor rights compliance, and workers' financial inclusion.**[11]
- By increasing access to finance, digital financial services can **increase women's financial autonomy**, support their labor participation, and improve business performance.[13,14]
- Financial services can **help platform workers at every stage**, including the financing they often need at the outset (e.g., to invest in tools) and during unforeseen events (e.g., climate, health).[17]

Photo: © Better Than Cash Alliance/ Elise Fitte-Duval

More jobs and economic growth through
DIGITAL FINANCIAL INCLUSION

JORDAN

When three Jordanian garment companies paid wages digitally, the time taken to make the payments fell by 66% for direct deposits to bank accounts, and by 70% for direct payments to e-wallets. Nearly three-quarters of Jordan's garment workers are women.[18]

BANGLADESH

As a result of wage digitization in the garment industry, the percentage of both male and female workers who regularly save rose by 21 percentage points. The percentage of women who said they were more confident in their ability to handle unforeseen financial shocks rose by 19 percentage points.[19]

INDIA

After digitizing wage payments, Gap reported time savings equivalent to adding 16 more full-time workers per month to the production lines. This also led to a **20% cut in the annual employee turnover**.[20]

KENYA

ImaliPay, an artificial intelligence-powered embedded finance solution for Africa's gig economy, provides PayGo financing, savings, and credit-building for productive purposes such as fuel, repairs, or a smartphone. ImaliPay generated a 100% rise in revenue per worker in Kenya in the first 12 weeks of its partnership with SafeBoda.[21,22]

ARGENTINA

Cuenta DNI is the first digital wallet designed to be interoperable using shared QR codes, and was introduced during COVID-19 for MSMEs.[23] It supported 4.6 million transactions between April 2020 and March 2021, and reached 58 million transactions and 5 million subscribers in 2022.[24]

INDONESIA

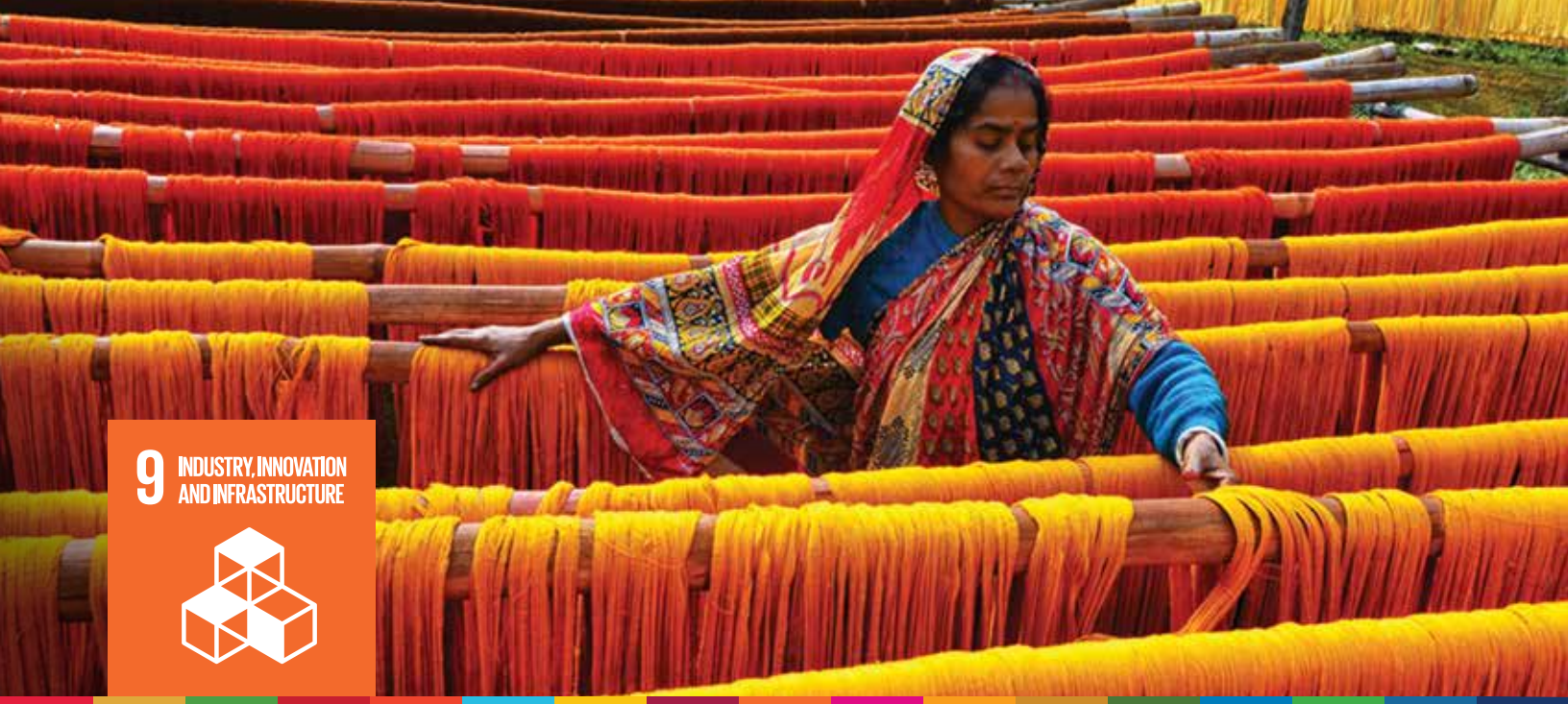
Gojek used digital payments to enhance logistics and payments for MSMEs, contributing to 1.6% of Indonesia's GDP in 2020.[25] The Government of Indonesia and Gojek have jointly committed to an **ambitious target of digitizing 30 million MSMEs by 2024**.[26]

CHINA

MYbank uses artificial intelligence, computing, and risk management technologies to boost the speed of loan approvals and improve customer service. It gave loans to over 7 million women-owned businesses between 2015 and 2020, totaling $43.8 billion, and provided women-owned businesses interest relief totaling more than $21.1 million.[27]

1. World Bank, no date. **2.** ILO, no date. **3.** ILO, 2019. **4.** Safran, 2022. **5.** BTCA, 2022a. **6.** BTCA, 2021a. **7.** BTCA, 2022b. **8.** IDH, no date. **9.** World Bank, 2021. **10.** ILO, 2021. **11.** Ibid. **12.** World Bank, 2022. **13.** Global Partnership for Financial Inclusion, 2020. **14.** BTCA, 2021b. **15.** Platform workers sell a wide array of services—from ride-hailing to freelance marketing services—while platform sellers offer goods via e-commerce sites and social media platforms (Roest and Bin-Humam, 2021). **16.** Murthy and Deshpande, 2022. **17.** Roest and Bin-Humam, 2021. **18.** BTCA, 2021a. **19.** Mastercard Center for Inclusive Growth, 2020. **20.** BTCA, 2021b. **21.** Murthy and Deshpande, 2022. **22.** Mercy Corps Ventures, 2021. **23.** IFC and SME Finance Forum for the G20 Global Partnership for Financial Inclusion, 2021. **24.** Bancoprovincia, 2022. **25.** GoJek, 2022. **26.** Nurhaliza and Adji, 2021. **27.** IFC and EC, 2020.

UNSGSA · BETTER THAN CASH ALLIANCE · UNCDF Impact Capital for Development · CGAP · WORLD BANK GROUP



February 2023

Expanding small industry through DIGITAL FINANCIAL INCLUSION

In emerging economies, 131 million or 41% of registered small and medium enterprises are either fully or partially credit-constrained. Of these firms, 23% are owned by women.[1,2] In many emerging markets, small and medium enterprises also operate below optimal productivity levels, impacting output, revenue, and employment generation.[3,4] Rural MSMEs in emerging economies face significant challenges in adapting to climate change, including a lack of resources and poor familiarity with climate-smart solutions.[5]

OPPORTUNITY

Digital financial services can support the productivity and growth of small and medium enterprises by enabling business owners to deliver a better customer experience. Businesses can benefit by, for example, accepting payments from any location via mobile phone, reducing costs compared with manual transactions, enabling better record-keeping through cloud-hosted transaction data, and by delivering services to a broader geographic area.[6,7]

CHALLENGES

- Small businesses have historically faced barriers to finance due to physical distance, lack of proper documentation, lack of credit history, and high cost.[8,9] COVID-19 lockdowns have also heightened the **risk of widespread bankruptcies**.[10]
- Only one in three small businesses was receiving a loan or line of credit in 2020–2021.[13] **Women-owned small and medium enterprises account for 32% of the finance gap in emerging economies**.[14]
- Low-income users face more difficulty **adapting to and participating in an increasingly technological and green economy**.[17]

SOLUTIONS

- Digital financial services can facilitate access to finance for small and medium enterprises. Simplified loan application processes and the use of alternative data for credit decision-making could **cut turnaround times**.[11] Lenders using alternative credit scoring and accepting non-traditional forms of collateral, including moveable assets, can give faster and cheaper credit.[12]
- Digital credit **can spur entrepreneurial growth,** particularly of small e-commerce firms.[15] Technological capabilities have also enabled lenders to reach underserved small and medium enterprises (e.g., firms in rural and remote areas, micro-enterprises, and informal ventures), and to cut transaction costs.[16]
- **Digital financial services could help low-income people to participate in the transition economy** by giving them access to markets, low-cost finance, education, and information.[18]

Photo: Sanghamitra Sarkar CGAP Photo Contest

Expanding small industry through
DIGITAL FINANCIAL INCLUSION

Photo: ©Better Than Cash Alliance / Junarya photography

SENEGAL

Of 343 businesses surveyed across 19 industries, **82% felt safer with digital wages** because they did not have to travel with their paychecks. Also, 57% of workers said they had better access to financial services after their wages were digitized.[19]

KENYA

NCBA Bank disbursed $3.9 billion in 2020 and $5.1 billion in 2021 using technology and innovation, including digital payments, credit access, and the immediate disbursement of small working capital loans.[20]

MEXICO

Grupo Bimbo, the world's largest baking company, worked with small retailers to help them adopt digital payments. **Sales revenue rose in one year by up to 30% for participating merchants.**[21]

INDIA

The Unified Payments Interface in India enabled the seamless flow of data and payments between banks and payment service providers, even allowing small businesses without a bank account to accept payments via a digital wallet.[22] By September 2021, the interface had grown to include around 259 participating financial service providers and more than 3.5 billion monthly transactions.[23]

AFRICA

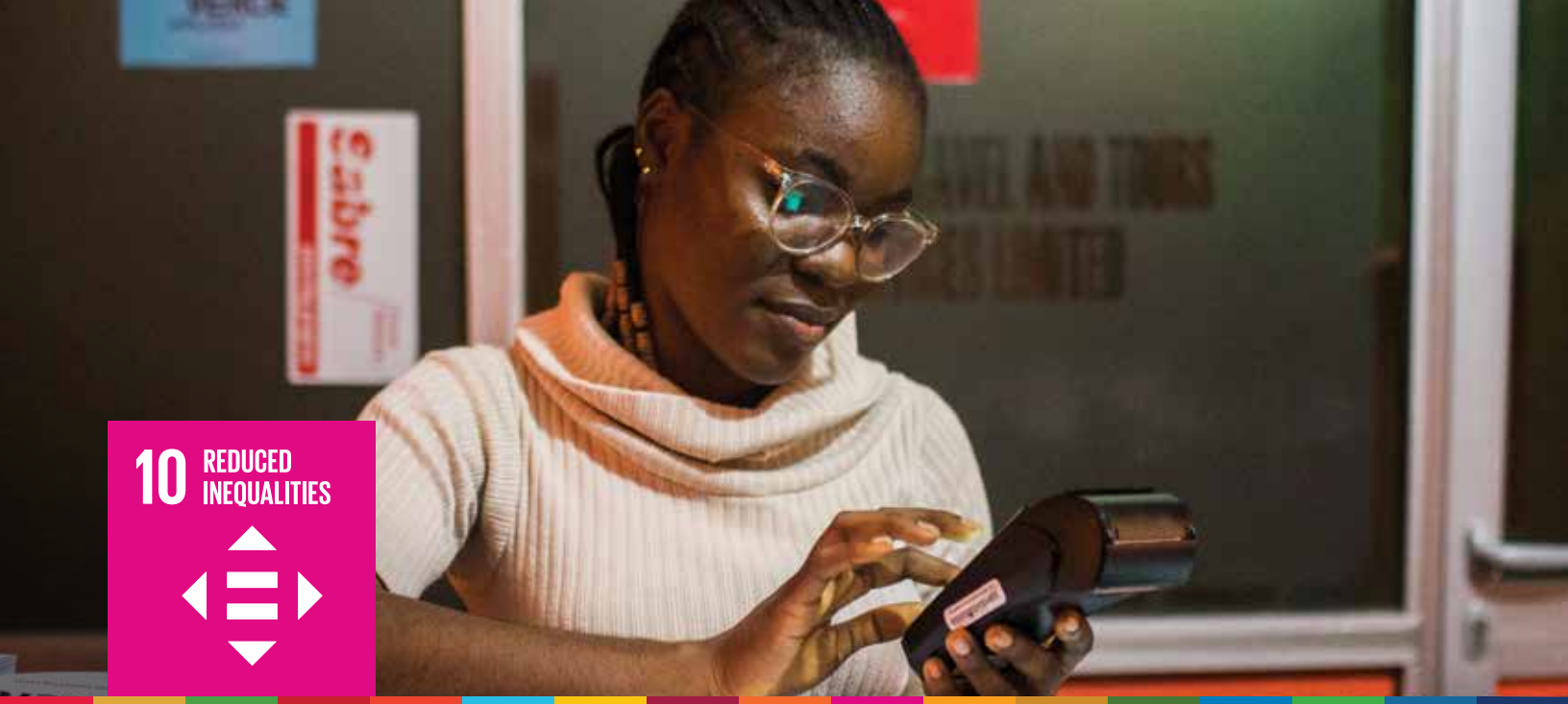
To authorize short-term loans, KopoKopo uses electronic transaction histories to evaluate the creditworthiness of MSMEs. Over 20,000 of the 45,000 merchants onboarded since its launch in 2012 were active in 2020.[24]

MEXICO

According to a recent Visa–60 Decibels survey of 753 micro and small businesses that have adopted digital payments, 72% of respondents confirmed more customer spending, and 75% reported higher revenues.[25]

1. GPFI, 2020. **2.** SME Finance Forum, 2018. **3.** Albaz et al., 2020. **4.** OECD, no date. **5.** GPFI, 2017. **6.** Deloitte, 2018. **7.** GPFI, 2020. **8.** Ibid. **9.** Sun et al., 2021. **10.** Small businesses have been forced to close and to lay off employees, while many others are facing cash flow difficulties (Karr, Loh, and Wirjo, 2020; Sun et al., 2021). **11.** GPFI, 2020. **12.** Frost et al., 2019. **13.** United Nations, 2022. **14.** SME Finance Forum, no date. **15.** Hau et al., 2021. **16.** OECD, 2020. **17.** Pasricha and Baur-Yazbeck, 2020. **18.** Ibid. **19.** BTCA, 2021a. **20.** Gamser and Chen, 2022. **21.** BTCA, 2021b. **22.** Carrière-Swallow, Haksar, and Patnam, 2021. **23.** BTCA, 2021c. **24.** Theuri, 2020. **25.** Visa, 2021.

UNSGSA · BETTER THAN CASH ALLIANCE · UNCDF Impact Capital for Development · CGAP · WORLD BANK GROUP



10 REDUCED INEQUALITIES

February 2023

Reducing inequality through DIGITAL FINANCIAL INCLUSION

Global poverty rates have risen for the first time in 20 years. Inequality has worsened, and the most disadvantaged groups have been hit the hardest. Over 90% of the people who have fallen into poverty as a result of the COVID-19 pandemic live in low- or lower-middle-income countries.[1] Between 2019 and 2021, the average income of the poorest 40% of households was estimated to have fallen by 2.2%, compared with just 0.5% for the richest 40% of households. By disproportionately affecting low-income individuals and women, climate change risks worsening inequality and pushing more people into poverty.[2]

OPPORTUNITY

Inclusive digital financial services can equip low-income households with the tools to make them more resilient to emergencies and income shocks, through products such as digital remittances, formal savings, and credit.

CHALLENGES

- Vulnerable populations, including women and people with low incomes, are typically **harder to reach during emergencies,** in spite of being disproportionately affected.
- Getting emergency funds through family or friends can be difficult if there are barriers to accessing them. Over 50% of remittances are sent to households in rural areas, but the **cost of remittances can be high**.[4]
- A lack of documentation and collateral makes **access to formal lending difficult** for low-income households and MSMEs that typically have meager cash buffers.[7]

SOLUTIONS

- Inclusive digital finance, including digital payment channels, can be used to disburse support payments to households and firms. This allows beneficiaries to **get relief payments more quickly and safely**, thus providing vulnerable populations with the resources to cope with adverse shocks.[3]
- Households spend more on food and other items, and lower their borrowing when remittance payments are high, thereby reducing extreme poverty.[5] Digital finance **lowers the cost of remittances**, which in turn helps to reduce poverty and build resilience to shocks.[6]
- Digital technologies can cut the high costs of the origination and servicing associated with shorter-term loans, by **automating credit underwriting, monitoring, and collection,** and by using low-cost digital disbursement and repayment processes. Together, these innovations make short-term loans to digitally connected MSMEs and households more viable.[8]

Photo: Communication for Development Ltd

Reducing inequality through

DIGITAL FINANCIAL INCLUSION

Photo: Dominic Chavez / World Bank

BANGLADESH

Low-income households and family members who had migrated to the city were introduced to mobile money accounts, resulting in more urban-to-rural remittance payments being sent back home. By extension, spending by mobile banking users on food and other items rose, and borrowing fell.[9]

MEXICO

Income rose by 7% when bank branches were rapidly opened in retail stores in rural Mexico, where people with low incomes benefited the most. Increased access to banking services created new jobs and made it easier for informal business owners to operate.[10]

ASIA

Data from a fintech in Korea used by low-income workers to send money home to developing economies in Asia show the cost and time savings of digital payments, and workers learning to optimize the timing of their transactions to get the best exchange rates.[11]

KENYA

Fuliza, the M-PESA overdraft facility launched in partnership with NCBA and KCB Bank, allowed users to complete payments or execute transfers even without sufficient balances in their accounts, effectively functioning as a short-term source of credit for household and business expenses, and emergencies.[12] Together with government policies that temporarily removed transfer fees, it is likely to have been a key factor in the doubling of digital payments processed in 2021.[13]

INDIA

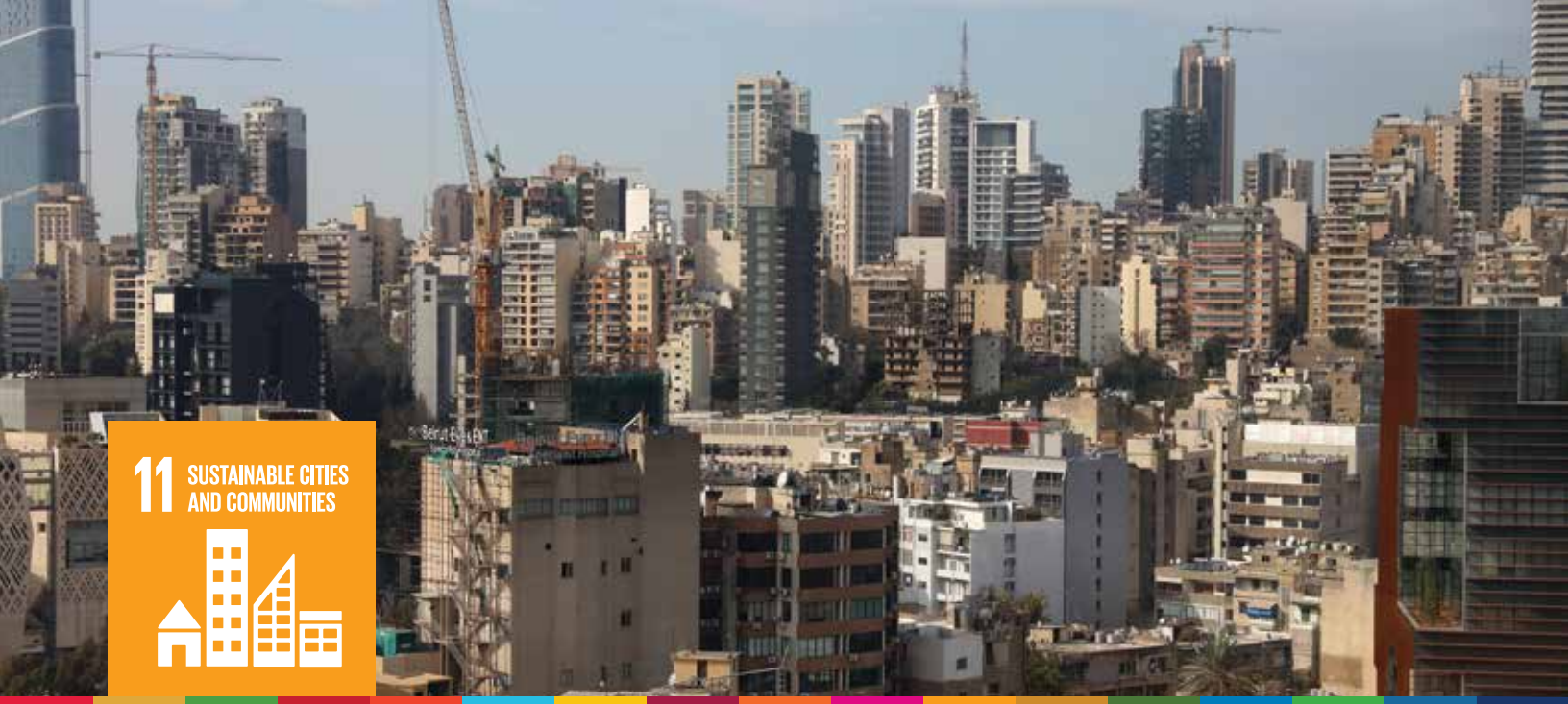
In rural communities, storing income in a digital bank account rather than keeping cash at home **raised household savings by 131% within three months,** and the effect was long-lasting.[14]

WORLDWIDE

By cutting the costs of remittances by five percentage points, recipients in emerging economies could benefit from **$20 billion more each year**.[15] In 2020, $12.7 billion cross-border remittances were made via mobile money.[16]

1. Mahler et al., 2021. **2.** IMF, 2021. **3.** World Bank, 2022a. **4.** IFAD, 2022. **5.** Lee et al., 2021. **6.** Jack and Suri, 2014. **7.** World Bank, 2022b. **8.** Ibid. **9.** Lee et al., 2021. **10.** Bruhn and Love, 2014. **11.** Agarwal et al., 2021. **12.** World Bank, 2022a. **13.** Safaricom, 2021. **14.** Somville and Vandewalle, 2018. **15.** Ratha, 2015. **16.** Visa, 2021.

UNSGSA · BETTER THAN CASH ALLIANCE · UNCDF Impact Capital for Development · CGAP · WORLD BANK GROUP



February 2023

Creating sustainable cities through DIGITAL FINANCIAL INCLUSION

The COVID-19 pandemic highlighted the importance of sustainable urban development through strengthening city resilience and access to basic services such as housing and transport for people with low incomes living in urban areas. Many countries will face challenges in meeting the needs of their growing urban populations, including for housing, transportation, energy systems, and other infrastructure, as well as for employment and basic services such as education and health care.[1]

OPPORTUNITY

Projections show a gradual shift of the human population toward urbanization, with the urban population predicted to rise to 68% by 2050. The efficiency gains of urbanization can be improved by digital payment solutions to encourage public transportation use, cut the overuse of limited resources, and make cities greener and more inclusive.

CHALLENGES

- One in four urban dwellers, or about 1 billion people, live in informal settlements. Housing finance is not keeping up with population growth and urbanization. It is estimated that over **3 billion people are expected to need affordable and adequate housing by 2030**.[2]
- **Only 52% of the urban population has access to** convenient public transportation.[3] Lack of transport leaves many without easy access to jobs, schools, health centers, and other basic services.
- **Congestion on roads** is strangling low- and middle-income countries.[5] Congestion in Manila costs the city around $70 million every day.[6]

SOLUTIONS

- Digital financial services models can offer **affordable financing options**, such as micro-mortgages, for people living in informal settlements.
- Digital solutions, including digital transit payment systems, have the potential to **improve the public transport systems while also making cities greener and more inclusive**.[4]
- Digital tolling systems **cut costs and leakages** while also allowing governments to accurately price the externalities caused by congestion.[7]

Photo: © Dominic Chavez / World Bank

Creating sustainable cities through

DIGITAL FINANCIAL INCLUSION

Photo: © Hendri Lombard / World Bank

INDIA

Digital tolls, through FASTag,[8] **raised tax collection by 55%** from 2016/2017 to 2020/2021.[9]

CHINA

The use of tap-to-pay instead of card-inserting systems on diesel buses led to 20% lower emissions compared with a cash payment system.[10]

RWANDA

Moving from cash to tap-and-go smart cards for buses in Kigali helped the bus operator to **raise revenue by 140% in just one month,** mostly by cutting leakage.[11, 12]

COLOMBIA

The use of smart transit cards in Bogota has facilitated $2.5 million in targeted subsidies, creating a 56% boost in ridership among recipients.[13]

SINGAPORE

Switching to an all-electronic tolling system lowered congestion, resulting in a 24% reduction in the number of trips taken to the city and also a 25% increase in speed of travel.[14]

1. United Nations, 2018. **2.** United Nations, 2022. **3.** Ibid. **4.** Arroyo Arroyo and Niina, 2021. **5.** Tellez-Merchan and Waldron, 2018. **6.** Baker and Watanabe, 2017. **7.** Tellez-Merchan and Waldron, 2018. **8.** NPCI, no date. **9.** PIB, 2021 **10.** Tang, Ceder, and Ge, 2020. **11.** Iqbal, 2016. **12.** Iqbal, 2016. **13.** Rodriguez and Peralta Quiros, 2016. **14.** BTCA, 2018.

UNSGSA · BETTER THAN CASH ALLIANCE · UNCDF Impact Capital for Development · CGAP · WORLD BANK GROUP

13 CLIMATE ACTION

February 2023

Combating and adapting to climate change through DIGITAL FINANCIAL INCLUSION

In 2021, around 3.6 billion people lived in contexts that were highly vulnerable to climate change. This number is expected to rise as global warming severely affects water availability, food, and the livelihoods of millions of people. Women and people with low incomes are disproportionately affected by climate-related shocks and stresses.[1]

OPPORTUNITY

Digital financial services can help vulnerable businesses, governments, and individuals, especially women, to mitigate and adapt to climate and disaster risks by enabling access to funds during an emergency, and for longer-term investments in more resilient and climate-friendly assets, livelihoods, and infrastructure.[2,3]

CHALLENGES

- Emerging economies will need to finance an estimated **$250 billion per year by 2030 to adapt to climate change;** five to 10 times more than current public finance flows for adaptation.[4]
- The social and economic transformations needed for climate-change mitigation and adaptation will impact particularly those who rely on natural resources for their livelihoods.[7]
- Over the past decade, **over 250 million people were forcibly displaced by natural disasters;** in emerging countries, **80% of these people were women.**[11, 12, 13]
- **Women are more vulnerable to the impacts of climate change and yet have less access to technology, social capital, and productive resources** to adapt and diversify their livelihoods.[19]
- Smallholder farmers have **limited access to finance, technology, public services, and the information needed** to adopt climate adaptation solutions.[21]

SOLUTIONS

- Digital financial services can enable climate financing to reach the people and places needing it the most. **Savings, loans, insurance and payment products** can incentivize and remunerate local communities' climate actions.[5,6]
- By accessing loans, insurance, and savings products, households and businesses can **invest in the skills, assets, and practices needed** to participate in the transition to low-carbon economies.[8,9,10]
- Digital payment systems offer **fast, targeted, and cost-efficient channels for financial assistance and insurance pay-outs**, as well as for information and early warnings, including to climate migrants.[14,15, 16, 17, 18]
- Digital financial services can enable women in rural and agricultural livelihoods to access finance, training, and climate-smart and time-saving tools that help to **maintain income sources, increase farm productivity, build financial resilience, and shift social norms**.[20]
- Access to climate risk insurance and safety nets gives farmers the **confidence they need to invest in their farms** by protecting them and their assets from hazards.[22]

Photo: Communication for Development Ltd

Combating and adapting to climate change through
DIGITAL FINANCIAL INCLUSION

TANZANIA

Mobile money users were more likely to receive remittances than non-users and, after a rainfall shock, the value of remittances received rose for mobile money users, replacing two-thirds of the losses incurred through the shock.[23]

KENYA

Through DigiFarm's digital mobile platform, **1.3 million farmers—with half of the active users being women smallholders—significantly raised their profits** in 2021, and were able to build their capacities to weather external shocks through access to financing, and quality seeds and inputs.[24]

INDIA

SMV Green Solutions has helped 1,700 rickshaw drivers to switch to e-rickshaws through a suite of services, including rickshaw sales, asset financing, and a pay-per-use battery swap service that enables drivers to avoid long charging times.[25]

KENYA

Despite the harsh climatic and economic conditions that affected about 2.5 million Kenyan farmers in 2020, **81% of those with a SunCulture solar irrigation system were able to raise their revenue.** This was compared with 88% of non-SunCulture farmers seeing a worsening of their economic situations. SunCulture aims to mitigate 2–3 million tonnes of CO_2 by scaling up its solar irrigation solutions across the continent within the next seven years.[26,27]

MALI

In 2021, severe storms hit rural regions in Mali and OKO Finance's mobile-based crop insurance product triggered a payout to 1,850 affected farmers totaling $100,000.[28] They were previously otherwise unprotected against this type of disaster.

BRAZIL

Carbon marketplace Acorn and startup reNature, in partnership with a Brazilian farmers' cooperative, produced their first round of 242 carbon removal units, resulting in each farmer earning around $19.[29]

CHINA

Between 2016 and 2021, 600 million Alipay Ant Forest users planted more than 326 million trees.[30] Working with farmers to plant them, to develop organic agricultural products, and to connect with e-commerce platforms, Alipay Ant Forest has also contributed to the creation of about 400,000 climate-smart jobs and $8.4 million in income between 2016 and 2019.[31]

1. IPCC, 2022. **2.** Ibid. **3.** Naughton and Brady, 2022. **4.** Chapagain et al., 2020. **5.** IIED, 2021. **6.** UNEP, 2019. **7.** CIF, 2021. **8.** Aggarwal et al., 2020. **9.** Paulson Institute Green Finance Center and the Research Center for Green Finance Development of Tsinghua University, 2020. **10.** Liu et al., 2021. **11.** UNDRR, 2022. **12.** Quiñones, 2021. **13.** UNDP, 2017. **14.** IPCC, 2022. **15.** Riley, 2018. **16.** Lopez, 2019. **17.** Calderone, Weingärtner and Kroessin, 2019. **18.** Pasricha and Baur-Yazbeck, 2020. **19.** Anderson, Coetzee, and Mattern, 2021. **20.** Ibid. **21.** Ibid. **22.** Ibid. **23.** Riley, 2018. **24.** Koyama et al., 2021. **25.** Karelia, 2021. **26.** Sunfinder, 2021. **27.** Aggarwal et al., 2020. **28.** Njiraini, 2021. **29.** reNature, 2021. **30.** Business Wire, 2021. **31.** UNFCCC, no date.

UNSGSA · BETTER THAN CASH ALLIANCE · UNCDF Impact Capital for Development · CGAP · WORLD BANK GROUP

February 2023

Promoting just and inclusive societies through DIGITAL FINANCIAL INCLUSION

Every year worldwide, 20% of government revenues go missing, amounting to about $5 trillion lost.[1] Every region suffers from corruption, and nearly one in six businesses have been approached by public officials for bribes.[2] Due to a combination of climate-related disasters and the socioeconomic effects of climate change, 200 million people every year—twice as many as in 2021—could need international humanitarian aid.[3]

OPPORTUNITY

Digital payments have the potential to help governments to overcome systemic challenges, resulting in less leakage and lower implementation costs, and the more effective monitoring of social protection programs.[4] This helps to hold governments to a higher standard of using public funds, and increases the funds available for vital public services, investments, and transfers.[5]

CHALLENGES

- In 2020, more than one in five people who used a public service used **personal connections**.[6] The use of cash in government payments makes it harder to trace funds, enabling corruption and leakages.[7]
- Millions of women are at risk from the insecurity and a lack of social protection that categorizes informal, temporary, and unpaid labor. In many emerging countries, **most of the women who earn incomes work informally**. The share is as high as 95% in Asia and 89% in sub-Saharan Africa.[11,12]
- **Tax revenue collection as a share of GDP is less than 15% in fragile countries**,[15] and only 15% to 20% in lower-income and middle-income countries. These shares compare with over 30% in upper-income countries.[16]

SOLUTIONS

- Governments delivering payments through secure, transparent, and convenient digital channels are able to reduce corruption.[8] Globally, **governments could save up to $1 trillion** by leveraging payment data and advanced analytics.[9,10]
- Government payments, such as public-sector wages, pensions, and safety-net transfers, were the reason vast numbers of women—140 million globally—were able to open their first bank account and so be financially included in the system.[13] According to Global Findex 2021, the **global gender gap in account ownership has narrowed to four percentage points**.[14]
- With reduced costs and increased transparency, digitizing tax payments and related activities in emerging countries can potentially raise an extra **$300 billion in government revenues every year**.[17] The digitization of bureaucratic procedures reduces discretion and the opportunities for bribery.[18]

Photo: Communication for Development Ltd

Promoting just and inclusive societies through
DIGITAL FINANCIAL INCLUSION

Photo: © Nugroho Nurdikiawan Sunjoyo / World Bank

INDIA

Between 2013 and March 2020, direct benefit transfers helped to **save a cumulative amount of $24.4 billion** by removing duplicate beneficiaries, cutting the cost of transactions, and plugging the leakages in the previous cash delivery system.[19]

RWANDA

Between 2013 and 2018, electronic billing machines cut the value-added tax (VAT) filing time from 5 hours to 45 minutes. The number of registered taxpayers nearly doubled between 2011 and 2018.[20]

MEXICO

Digitizing tax payments **raised overall tax revenue and social security contributions by 95%,** to almost $140 billion, between 2010 and 2016. Further, larger businesses started pushing smaller providers to use e-invoices, bringing an estimated 4.2 million micro-enterprises into the formal economy.[21]

CAMBODIA

Digitizing person-to-government payments by Cambodia's Ministry of Public Works and Transport raised the revenue from almost $15 million in 2017 to $37 million in 2019.[22]

UGANDA

The government saved nearly $7 million in less than a year in 2016–17 by verifying the digital identities of civil servants against the national identity database and removing more than 4,600 ghost workers from the public payroll.[23]

1. Cunningham, Davis and Dohrmann, 2018. **2.** United Nations, 2022. **3.** Costella et al., 2021. **4.** Hare and Parekh, 2020. **5.** BTCA, 2020. **6.** Transparency International, 2020. **7.** Manyika et al., 2016. **8.** Setor, Senyo, and Addo, 2021. **9.** Cunningham, Davis and Dohrmann, 2018. **10.** Wald, 2018. **11.** World Bank, 2020. **12.** ILO, 2018. **13.** Miller et al., 2020. **14.** World Bank, 2021. **15.** Chehade et al., 2021. **16.** Bachas, Kondylis, and Loeser, 2021. **17.** BTCA, 2020. **18.** Santiso, 2021. **19.** Jain et al., 2021. **20.** BTCA, 2020. **21.** Ibid. **22.** Fichers and Naji, 2020. **23.** World Bank, 2018.

UNSGSA · BETTER THAN CASH ALLIANCE · UNCDF Impact Capital for Development · CGAP · WORLD BANK GROUP

References

Introduction

UNDRR Database. https://www.undrr.org/gar2022-our-world-risk.

United Nations, 2021. Women bear the brunt of the climate crisis, COP26 highlights. United Nations, 9 November. https://news.un.org/en/story/2021/11/1105322.

UNSGSA, BTCA, and WBG, 2018. Igniting SDG Progress Through Digital Financial Inclusion. https://www.betterthancash.org/explore-resources/igniting-sdg-progress-through-digital-financial-inclusion.

UN Women, 2022. Poverty deepens for women and girls, according to latest projections. https://data.unwomen.org/features/poverty-deepens-women-and-girls-according-latest-projections.

World Bank, 2021. Global Findex Database 2021: Financial Inclusion, Digital Payments, and Resilience in the Age of COVID-19. https://www.worldbank.org/en/publication/globalfindex.

Aker, J.C., et al., 2016. Payment Mechanisms and Antipoverty Programs: Evidence from a Mobile Money Cash Transfer Experiment in Niger. *Economic Development and Cultural Change*, vol. 65, no. 1. https://www.journals.uchicago.edu/doi/10.1086/687578.

Arbelaez, M., Fergusson, L., and Zambrano, A., 2019. Endogenous Persistent Shocks and Poverty Traps. https://sistemas.colmex.mx/Reportes/LACEALAMES/LACEA-LAMES2019_paper_127.pdf.

Batista, C., and Vicente, P.C., 2022. Is Mobile Money Changing Rural Africa? Evidence from a field experiment. https://www.catiabatista.org/batista_vicente_mm_experiment.pdf.

Bill & Melinda Gates Foundation, 2021. The Impact of Mobile Money on Poverty. Seattle, WA: Bill & Melinda Gates Foundation. https://docs.gatesfoundation.org/Documents/ImpactofMobileMoneyonPoverty_ResearchBrief.pdf.

BTCA, 2022. Colombia's Ingreso Solidario Case Study. https://www.betterthancash.org/alliance-reports/colombias-ingreso-solidario.

CGAP, 2020. Annual Report 2020. Washington, DC: Consultative Group to Assist the Poor (CGAP). https://www.cgap.org/sites/default/files/organizational-documents/2020_09_CGAP_2020_Annual_Report.pdf.

CGAP, 2021. Addressing Gender Norms to Increase Financial Inclusion: Designing for Impact. Washington, DC: Consultative Group to Assist the Poor (CGAP). https://www.cgap.org/research/publication/addressing-gender-norms-increase-financial-inclusion-designing-impact.

Gerard, F., Naritomi, J., and Silva, J., 2021. Cash Transfer Programmes can Stimulate the Local Economy: Evidence from Brazil. https://voxdev.org/topic/macroeconomics-growth/cash-transfer-programmes-can-stimulate-local-economy-evidence-brazil.

Heltberg, R., Oviedo, A., and Talukdar, F., 2014. What do Household Surveys Really Tell us About Risk, Shocks, and Risk Management in the Developing World? (Accepted manuscript.) *The Journal of Development Studies*. https://openknowledge.worldbank.org/bitstream/handle/10986/22642/fjds-10.108000220388.2014.959934.pdf.

Ingreso Solidario Website https://ingresosolidario.prosperidadsocial.gov.co/

International Finance Corporation and SME Finance Forum, 2021. MSME Digital Finance - Resilience & Innovation During COVID-19. G20 Global Partnership for Financial Inclusion. https://www.gpfi.org/sites/gpfi/files/documents/5_IFC-SMEFF%20Report_MSME%20digital%20finance_Resilience%20and%20Innovation%20during%20COVID-19.pdf.

Jack, W., and Suri, T., 2016. The Long-Run Poverty and Gender Impacts of Mobile Money. *Science*, vol. 354, Issue 6317, pages 1298–1292. https://www.science.org/doi/10.1126/science.aah5309.

Sekabira, H., and Qaim, M., 2017. *M*obile Money, Agricultural Marketing, and off-Farm Income in Uganda. *Agricultural Economics.* https://doi.org/10.1111/agec.12360.

Task Force on Digital Financing of the Sustainable Development Goals, 2020. People's Money: Harnessing Digitalization to Finance a Sustainable Future. New York: United Nations Secretary-General. https://unsdg.un.org/sites/default/files/2020-08/DF-Task-Force-Full-Report-Aug-2020-1.pdf.

UN Women, 2022. Poverty Deepens for Women and Girls, According to Latest Projections. https://data.unwomen.org/features/poverty-deepens-women-and-girls-according-latest-projections.

Venkatesan, J., and Stark, E., 2022. A PACT to Promote Resilience: Using a Framework to Understand How Fintechs and Their Customers Cope, Survive, and Thrive. Center for Financial Inclusion, Accion. https://content.centerforfinancialinclusion.org/wp-content/uploads/sites/2/2022/02/A-PACT-to-Promote-Resilience-1.pdf.

World Bank, 2021. Global Findex Database 2021: Financial Inclusion, Digital Payments, and Resilience in the Age of COVID-19. https://www.worldbank.org/en/publication/globalfindex.

World Bank Group, 2021. COVID-19 G2P Cash-Transfer Payments Country Brief: Colombia. Washington, DC: World Bank Group. https://thedocs.worldbank.org/en/doc/863501593464582316-0090022020/original/WorldBankG2PxCOVID19ColombiaBrief.pdf.

World Bank Group, 2022. June 2022 global economic prospects. Washington, DC: World Bank Group. https://openknowledge.worldbank.org/bitstream/handle/10986/37224/9781464818431.pdf.

Aker, J.C., et al., 2016. Payment Mechanisms and Antipoverty Programs: Evidence from a Mobile Money Cash Transfer Experiment in Niger. *Economic Development and Cultural Change*, vol. 65, no. 1. https://www.journals.uchicago.edu/doi/10.1086/687578.

Asia-Pacific Economic Cooperation, 2017. The Role of Digital Payments in Sustainable Agriculture and Food Security. New York: Better Than Cash Alliance. https://www.apec.org/docs/default-source/Publications/2017/10/The-Role-of-Digital-Payments-in-Sustainable-Agriculture-and-Food-Security/217_FMP_Agriculture.pdf.

CGAP, 2021. Addressing Gender Norms to Increase Financial Inclusion: Designing for Impact. Washington, DC: Consultative Group to Assist the Poor (CGAP). https://www.cgap.org/research/publication/addressing-gender-norms-increase-financial-inclusion-designing-impact.

Delavallade, C., et al. 2015. Managing Risk with Insurance and Savings: Experimental Evidence for Male and Female Farm Managers in West Africa. Washington, DC: International Food Policy Research Institute. https://www.ifpri.org/publication/managing-risk-insurance-and-savings-experimental-evidence-male-and-female-farm-managers.

EY, 2020. Can Digital Innovation Help End Hunger? Ernst & Young (EY). https://assets.ey.com/content/dam/ey-sites/ey-com/en_gl/topics/corporate-social-responsibility/ey-sfsa-can-digiital-innovation-help-end-hunger.pdf.

FAO, 2018. Smallholder Farmers' Data Portrait: What the Numbers Tell Us About Smallholder Farms. Rome: Food and Agriculture Organization of the United Nations (FAO). https://www.fao.org/fileadmin/templates/esa/smallholders/smallholders_dataportrait.pdf.

FAO, 2021. The State of Food Security and Nutrition in the World 2021: The world is at a critical juncture. Rome: Food and Agriculture Organization of the United Nations (FAO). https://www.fao.org/state-of-food-security-nutrition/2021.

IFC, 2019. Working with Smallholders: A Handbook for Firms Building Sustainable Supply Chains. Washington, DC: International Finance Corporation (IFC). https://openknowledge.worldbank.org/handle/10986/29764.

Kikulwe, E., Fischer, E., and Qaim, M., 2014. Mobile Money, Smallholder Farmers, and Household Welfare in Kenya. *PLoS ONE*, vol. 9, no. 10, p. e109804. https://doi.org/10.1371/journal.pone.0109804.

Kumaraswamy, S.K., and Bin-Humam, Y., 2019. 3 Ways Financial Inclusion Improves Women's Food Security. Consultative Group to Assist the Poor. https://www.cgap.org/blog/3-ways-financial-inclusion-improves-womens-food-security.

Lehmann, C., and Masterson, D., 2014. An Impact Evaluation of the 2013-2014 Winter Cash Assistance Program for Syrian Refugees in Lebanon. New York: International Rescue Committee. https://www.calpnetwork.org/wp-content/uploads/2020/01/emergency-economies-evaluation-report-irc.pdf.

Lonie, S., et al., 2018. Opportunities for Digital Financial Services in the Cocoa Value Chain: Côte d'Ivoire: Insights from New Data. Washington, DC: International Finance Corporation. https://openknowledge.worldbank.org/bitstream/handle/10986/30203/128223-WP-IVC-ENGLISH-Digitizing-Cocoa-Value-Chain-PUBLIC.pdf.

Lopez, M., 2019. Harnessing the Power of Mobile Money to Achieve the Sustainable Development Goals. London: GSM Association. https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2019/10/GSMA-Harnessing-the-power-of-mobile-money-to-achieve-the-SDGs.pdf.

Lowder, S., et al., 2021. Which Farms Feed the World and Has Farmland Become More Concentrated? *World Development*. http://www.db.zs-intern.de/uploads/1644400674-2021WorldDevelopmentSmallFarms.pdf.

Pople, A., et al., 2021. Anticipatory cash transfers in climate disaster response. Centre for Disaster Protection. https://static1.squarespace.com/static/61542ee0a87a394f7bc17b3a/t/61b9bec86ba2e76d344f8b63/1639562959520/FINAL%2BAnticipatory_Cash_Transfers_in_Climate_Disaster_Response%2B%28for%2BWP%29%2BF3.pdf.

Schroeder, L., 2020. Food Security and COVID-19: How Financial Inclusion can Support Livelihoods. Center for Financial Inclusion. https://www.centerforfinancialinclusion.org/food-security-and-covid-19-how-financial-inclusion-can-support-livelihoods.

United Nations, 2021, The Sustainable Development Goals Report 2021. New York: United Nations. https://unstats.un.org/sdgs/report/2021/The-Sustainable-Development-Goals-Report-2021.pdf.

UN Women, no date. SDG 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture. https://www.unwomen.org/en/news/in-focus/women-and-the-sdgs/sdg-2-zero-hunger.

USAID, 2018. Using Digital Tools to Expand Access to Agricultural Insurance. Washington, DC: United States Agency for International Development (USAID). https://www.usaid.gov/sites/default/files/documents/15396/Guide_to_Using_Digital_Tools_to_Expand_Agricultural_Insurance.pdf.

Weiser, C., et al., 2019. The Impact of Mobile Money on Poor Rural Households: Experimental Evidence from Uganda. World Bank Group. Washington, DC: https://openknowledge.worldbank.org/bitstream/handle/10986/31978/WPS8913.pdf.

60 Decibels, 2021a. Insights from Surveying Polio Vaccinators: Côte d'Ivoire. https://60decibels.com/user/pages/07.Work/_polio_vaccinators/Insights%20From%20Surveying%20Polio%20Vaccinators%20Cote%20dIvoire.pdf.

60 Decibels, 2021b. Insights from Surveying Polio Vaccinators: Liberia: Campaign Round 1. https://60decibels.com/user/pages/07.Work/_polio_vaccinators/Insights%20From%20Surveying%20Polio%20Vaccinators%20Liberia.pdf.

AFI, 2021. Case Studies of Multisectoral Approaches to Integrating Digital Financial Services for Women's Financial Inclusion. Alliance for Financial Inclusion (AFI). https://www.afi-global.org/wp-content/uploads/2021/10/DWFS_Gender_CS_FINAL.pdf.

Ahmed, H., and Cowan, B., 2021. Mobile Money and Healthcare Use: Evidence from East Africa. *World Development*, vol. 141, issue C. https://econpapers.repec.org/article/eeewdevel/v_3a141_3ay_3a2021_3ai_3ac_3as0305750x21000048.htm.

Bangura, J.A., 2016. Saving Money, Saving Lives: A Case Study on the Benefits of Digitizing Payments to Ebola Response Workers in Sierra Leone: Executive Summary. New York: Better Than Cash Alliance. https://btca-production-site.s3.amazonaws.com/documents/294/english_attachments/BTC-Ebola-Case-Study-ExecutiveSummary.pdf.

BTCA, 2020, Putting Digital Payments to Work in the Time of COVID-19. Better Than Cash Alliance (BTCA). https://www.betterthancash.org/news/putting-digital-payments-to-work-in-the-time-of-covid-19.

BTCA, 2021a. UN Principles for Responsible Digital Payments. New York: Better Than Cash Alliance (BTCA). https://responsiblepayments.org/pdfs/UN-ResponsiblePayments.pdf.

BTCA, 2021b. Measuring Progress to Scale: Responsible Digital Payments in Bangladesh. Better Than Cash Alliance (BTCA). https://btca-production-site.s3.amazonaws.com/document_files/8/document_files/Bangladesh_Country_Diagnostic.pdf.

CarePay and Ajua, 2020. Mobile Health Transformation in Kenya: The Influence of Mobile Phones on Kenya's Healthcare Sector. http://mtiba.com/report/Mobile%20Health%20Transformation%20Report.pdf.

Chaintreau, M., Mvondo, J.P., and Annoussamy, S., 2021. Digitizing Workers Payments for Economic Recovery and Decent Work: Example of Senegal. New York: Better Than Cash Alliance. https://btca-production-site.s3.amazonaws.com/documents/606/english_attachments/Digitizing_workers_payments_for_economic_recovery_and_decent_work.pdf?.

Egami, H., and Matsumoto, T., 2020. Mobile Money Use and Healthcare Utilization: Evidence from Rural Uganda. *Sustainability*, vol. 12, no. 9, p. 3741. http://dx.doi.org/10.3390/su12093741.

GSMA, 2020. Connected Women: The Mobile Gender Gap Report 2020. London: GSM Association (GSMA). https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2020/05/GSMA-The-Mobile-Gender-Gap-Report-2020.pdf.

McConnell, M., et al., 2022. How are Health Workers Paid and Does it Matter? Conceptualising the Potential Implications of Digitising Health Worker Payments. *BMJ Global Health*, vol. 7, e007344. https://gh.bmj.com/content/bmjgh/7/1/e007344.full.pdf.

Pazarbasioglu, C., et al., 2020. Digital Financial Services. Washington, DC: World Bank Group. https://pubdocs.worldbank.org/en/230281588169110691/Digital-Financial-Services.pdf.

Peverelli, R., and de Feniks, R., 2017. JAMII: Bringing Affordable Health Insurance to Low Income Tanzanians. Digital Insurance Agenda. https://www.digitalinsuranceagenda.com/featured-insurtechs/jamii-bringing-affordable-health-insurance-to-low-income-tanzanians/#:~:text=The%20product%20Jamii%2C%20stands%20out,market%2C%20the%20low%20income%20population.

Prina, S., 2015. Banking the Poor via Savings Accounts: Evidence from a Field Experiment. *Journal of Development Economics*, vol. 115, pp. 16–31. https://doi.org/10.1016/j.jdeveco.2015.01.004.

Rasmussen, S., and Mattern, M., 2022. The Essential Role of Finance in Education, Housing and Health Care. Washington, DC: Consultative Group to Assist the Poor. https://www.cgap.org/blog/essential-role-finance-education-housing-and-health-care.

Russo, G., et al., 2019. Health Workers' Strikes in Low-Income Countries: The Available Evidence. *Bulletin of the World Health Organization*, vol. 7, no. 7, pp. 460–467H. https://pubmed.ncbi.nlm.nih.gov/31258215.

Salama, P., McIsaac, M., and Campbell, J., 2019. Health Workers' Strikes: A Plea for Multisectoral Action. *Bulletin of the World Health Organization*, vol. 97, no. 7, pp. 443–443A. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6593339.

Signé, L., 2021. Capturing Africa's Insurance Potential for Shared Prosperity. Brookings. https://www.brookings.edu/blog/africa-in-focus/2021/07/02/capturing-africas-insurance-potential-for-shared-prosperity.

USAID, 2018. The Role of Digital Financial Services in Accelerating USAID's Health Goals. Washington, DC: United States Agency for International Development (USAID). https://www.usaid.gov/sites/default/files/documents/15396/DFS_Accelerating_USAID_HealthGoals.pdf.

WHO, 2021a. More Than Half a Billion People Pushed or Pushed Further into Extreme Poverty Due to Health Care Costs. World Health Organization (WHO). https://www.who.int/news/item/12-12-2021-more-than-half-a-billion-people-pushed-or-pushed-further-into-extreme-poverty-due-to-health-care-costs#:~:text=Even%20before%20the%20pandemic%2C%20half,Ghebreyesus%2C%20WHO%20Director%2DGeneral.

WHO, 2021b. Climate Change and Health. World Health Organization (WHO). https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health.

World Bank, 2021. Global Findex Database 2021: Financial Inclusion, Digital Payments, and Resilience in the Age of COVID-19. https://www.worldbank.org/en/publication/globalfindex.

Dusza, B., 2016. Liberian Teacher ePayments: Stepping Stones to Inclusion. Consultative Group to Assist the Poor. https://www.cgap.org/blog/liberian-teacher-epayments-stepping-stones-inclusion.

Eneza Education, 2021. A Look at 2021. https://enezaeducation.com/a-look-at-2021/.

Gelb, A., et al., 2019. Primary Education Stipends in Bangladesh: Do Mothers Prefer Digital Payments over Cash?. Washington, DC: Center for Global Development. https://www.cgdev.org/sites/default/files/primary-education-stipends-bangladesh-do-mothers-prefer-digital-payments-over-cash.pdf.

GSMA, 2020. Educating School Children Through SMS and Mobile Technology. London: GSM Association (GSMA). https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2020/05/Eneza-Education-Educating-school-children-through-SMS-and-mobile-technology.pdf.

Katete, S., and Nyangarika, A., 2020. Effects of Late and Non-Payment of Teachers' Salaries and Benefits on Learning Process in Public Secondary Schools. *International Journal of Advance Research and Innovative Ideas in Education*, vol. 6, issue 4, pp. 1274–1290. http://ijariie.com/AdminUploadPdf/Effects_of_Late_and_Non_Payment_of_Teachers%E2%80%99_Salaries_and_Benefits_on_Learning_Process_in_Public_Secondary_Schools_ijariie12448.pdf.

Mastercard Center for Inclusive Growth, 2019. How Mobile Payments Can Help Keep Children in School. https://www.mastercardcenter.org/insights/how-mobile-payments-can-help-keep-children-in-school.

Mattern, M., and Garcia, A., 2021. In Uganda, Solar Home Systems Help Students Stay in School. Consultative Group to Assist the Poor. https://www.cgap.org/blog/uganda-solar-home-systems-help-students-stay-school.

Miebach, M., 2019. How Digital Solutions will Make 500 Million People Stronger. https://www.politico.com/sponsor-content/2019/10/10/how-digital-solutions-will-make-500-million-people-stronger.

Ministry of Education, Colombia, 2018. Familias en Acción. https://www.mineducacion.gov.co/portal/Preescolar-basica-y-media/Proyectos-Cobertura/235127:Familias-en-Accion.

Prina, S., 2015. Banking the Poor via Savings Accounts: Evidence from a Field Experiment. *Journal of Development Economics*, vol. 115, pp. 16–31. https://doi.org/10.1016/j.jdeveco.2015.01.004.

Rasmussen, S., and Mattern, M., 2022. The Essential Role of Finance in Education, Housing and Health Care. Consultative Group to Assist the Poor. https://www.cgap.org/blog/essential-role-finance-education-housing-and-health-care.

Rohatgi, S., and Galdava, E., 2018. The Role of Digital Financial Services in Accelerating USAID Education Goals. Washington, DC: United States Agency for International Development. https://www.usaid.gov/sites/default/files/documents/15396/Role_of_DFS_in_Accelerating_USAID_Education_Goals.pdf.

UNGEI, 2018. Gender and Inclusive Education. https://www.ungei.org/blog-post/gender-and-inclusive-education.

UNESCO, 2020. UNESCO Report on Inclusion in Education Shows 40% of Poorest Countries Did Not Provide Specific Support to Disadvantaged Learners During COVID-19 Crisis. United Nations Educational, Scientific and Cultural Organization (UNESCO). https://en.unesco.org/news/unesco-report-inclusion-education-shows-40-poorest-countries-did-not-provide-specific-support.

UNESCO, 2021. UNESCO Warns 117 Million Students Around the World are Still Out of School. United Nations Educational, Scientific and Cultural Organization (UNESCO). https://en.unesco.org/news/unesco-warns-117-million-students-around-world-are-still-out-school.

UNICEF, 2021a. Schoolchildren Worldwide Have Lost 1.8 Trillion Hours and Counting of In-Person Learning Due to COVID-19 Lockdowns, Says UNICEF. United Nations Children's Fund (UNICEF). https://www.unicef.org/press-releases/schoolchildren-worldwide-have-lost-18-trillion-hours-and-counting-person-learning#:~:text=NEW%20YORK%2C%2017%20September%202021,19%20pandemic%20and%20subsequent%20lockdowns.

UNICEF, 2021b. One Billion Children at 'Extremely High Risk' of the Impacts of the Climate Crisis. United Nations Children's Fund (UNICEF). https://www.unicef.org/press-releases/one-billion-children-extremely-high-risk-impacts-climate-crisis-unicef.

USAID, 2018. The Role of Digital Financial Services in Accelerating USAID's Education Goals. Washington, DC: United States Agency for International Development (USAID). https://www.usaid.gov/sites/default/files/documents/15396/Role_of_DFS_in_Accelerating_USAID_Education_Goals.pdf.

Aker, J.C., et al., 2016. Payment Mechanisms and Antipoverty Programs: Evidence from a Mobile Money Cash Transfer Experiment in Niger. *Economic Development and Cultural Change*, vol. 65, no. 1. https://www.journals.uchicago.edu/doi/10.1086/687578.

Ashraf, N., Karlan, D., and Yin, W., 2010. Female Empowerment: Further Evidence from a Commitment Savings Product in the Philippines. *World Development*, vol. 38, no. 3, pp. 333–344. https://www.hbs.edu/faculty/Pages/item.aspx?num=40276.

Bachas, P., et al., 2021. How Debit Cards Enable the Poor to Save More. *Journal of Finance*, vol. 76, no. 4, pp. 1913–1957. https://doi.org/10.1111/jofi.13021.

Bill & Melinda Gates Foundation, 2021. The Impacts of Digital Financial Services On Women's Economic Empowerment. Seattle, WA: Bill & Melinda Gates Foundation. https://docs.gatesfoundation.org/documents/the_impacts_of_digital_financial_services_on_womens_economic_empowerment_financial_services_for_the_poor.pdf.

Breza, E., Kanz, M., and Klapper, L.F., 2020. Learning to Navigate a New Financial Technology: Evidence from Payroll Accounts. Cambridge, MA: National Bureau of Economic Research. https://www.nber.org/papers/w28249.

Bruhn, M., Ibarra, G.L., and McKenzie, D., 2014. The Minimal Impact of a Large-Scale Financial Education Program in Mexico City. *Journal of Development Economics*, vol. 108, May, pp. 184–189. https://doi.org/10.1016/j.jdeveco.2014.02.009.

Bruhn, M., et al., 2016. The Impact of High School Financial Education: Evidence from a Large-Scale Evaluation in Brazil. *American Economic Journal: Applied Economics*, vol. 8, no. 4, pp. 256–295. https://www.jstor.org/stable/26156189.

Dalal, P., Gomez, L., and Patel, A., 2022. Give Her Credit: Expanding Women's Access to Finance. Mastercard Center for Inclusive Growth. https://www.mastercardcenter.org/insights/give-her-credit-expanding-womens-access-to-finance.

Demirgüç-Kunt, A., et al., 2022. Global Findex Database 2021: Financial Inclusion, Digital Payments, and Resilience in the Age of COVID-19. Washington, DC: World Bank Group. https://elibrary.worldbank.org/doi/abs/10.1596/978-1-4648-1897-4.

Doi, Y., McKenzie, D., and Zia, B., 2014. Who You Train Matters: Identifying Combined Effects of Financial Education on Migrant Households. *Journal of Development Economics*, vol. 109, July, pp. 39–55. https://doi.org/10.1016/j.jdeveco.2014.03.009.

Dupas, P., and Robinson, J., 2013. Savings Constraints and Microenterprise Development: Evidence from a Field Experiment in Kenya. *American Economic Journal: Applied Economics*, vol. 5, no. 1, pp. 163–192. https://www.aeaweb.org/articles?id=10.1257/app.5.1.163.

EFL Global, 2018. Enhancing Application Scorecards with Biometrics. EFL Global.

Fernandes, D., Lynch, Jr., J.G., and Netemeyer, R.G., 2014. Financial Literacy, Financial Education, and Downstream Financial Behaviors. *Management Science*, vol. 60, no. 8, pp. 1861–1883. https://www.jstor.org/stable/42919641.

Field, E., et al., 2021. On Her Own Account: How Strengthening Women's Financial Control Impacts Labor Supply and Gender Norms. *American Economic Review*, vol. 111, no. 7, pp. 2342–2375. https://www.aeaweb.org/articles?id=10.1257/aer.20200705.

Financial Alliance for Women, 2020. Gender-Differentiated Credit Scoring: A Potential Game-Changer for Women. https://financialallianceforwomen.org/news-events/gender-differentiated-credit-scoring-a-potential-game-changer-for-women.

FinEQUITY, 2020. https://www.finequity.org.

Global Partnership for Financial Inclusion and IFC, 2013. Small and Medium Enterprise Finance: New Findings, Trends and G-20/Global Partnership for Financial Inclusion Progress. Washington, DC: International Finance Corporation (IFC). https://www.gpfi.org/sites/gpfi/files/documents/SME%20Finance%20New%20Findings%2C%20Trends%20and%20G20%20GPFI%20Progress.pdf.

GSMA, 2022. Mobile Internet, Well-being and Gender: Understanding the Links. London: GSM Association (GSMA). https://www.gsma.com/mobilefordevelopment/resources/mobile-internet-well-being-and-gender-understanding-the-links.

Harigaya, T., 2020. Effects of Digitization on Financial Behaviors: Experimental Evidence from the Philippines. https://tomokoharigaya.files.wordpress.com/2020/09/harogaya_mfs_sep2020.pdf.

HERproject. https://herproject.org.

IPCC, 2022. Climate Change 2022. Intergovernmental Panel on Climate Change (IPCC). https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_FinalDraft_FullReport.pdf.

Kast, F., Meier, S., and Pomeranz, D., 2018. Saving More in Groups: Field Experimental Evidence from Chile. *Journal of Development Economics*, vol. 133, July, pp. 275–294. https://doi.org/10.1016/j.jdeveco.2018.01.006.

Lee, J.N., et al., 2021. Poverty and Migration in the Digital Age: Experimental Evidence on Mobile Banking in Bangladesh. *American Economic Journal: Applied Economics*, vol. 13, no. 1, pp. 38–71. https://www.aeaweb.org/articles?id=10.1257/app.20190067.

Prina, S., 2015. Banking the Poor via Savings Accounts: Evidence from a Field Experiment. *Journal of Development Economics*, vol. 115, pp. 16–31. https://doi.org/10.1016/j.jdeveco.2015.01.004.

Quiñones, L., 2021. Women Bear the Brunt of the Climate Crisis, COP26 Highlights. UN News. United Nations. https://news.un.org/en/story/2021/11/1105322.

Robinson, J., Park, D.S., and Blumenstock, J.E., 2022. The Impact of Digital Credit in Developing Economies: A Review of Recent Evidence. https://escholarship.org/uc/item/3d31p39h.

Sirtaine, S., and McKay, M., 2022. In an Era of Urgent Climate Risk, Does Financial Inclusion Matter? Consultative Group to Assist the Poor. https://www.cgap.org/blog/era-urgent-climate-risk-does-financial-inclusion-matter.

Torres, J., et al., 2021. The Impact of the COVID-19 Pandemic on Women-Led Businesses. Washington, DC: World Bank. https://openknowledge.worldbank.org/bitstream/handle/10986/36435/The-Impact-of-the-COVID-19-Pandemic-on-Women-Led-Businesses.pdf.

UNDP, 2017. Gender and Climate Change. New York: United Nations Development Programme (UNDP). https://www.undp.org/publications/gender-and-climate-change#modal-publication-download.

UNDRR, 2022. Our World at Risk: Transforming Governance for a Resilient Future. United Nations Office for Disaster Risk Reduction (UNDRR). https://www.undrr.org/gar2022-our-world-risk.

WeFi, 2022. Supporting Women Entrepreneurs in Developing Countries: What Works? https://we-fi.org/wp-content/uploads/2022/07/We-Fi-Evidence-Paper.pdf.

World Bank, 2021. Principles on Identification for Sustainable Development: Toward the Digital Age. Washington, DC: World Bank. https://documents1.worldbank.org/curated/en/213581486378184357/pdf/Principles-on-Identification-for-Sustainable-Development-Toward-the-Digital-Age.pdf.

World Bank, 2022. World Development Report 2022: Finance for an Equitable Recovery. Washington, DC: World Bank. https://doi.org/10.1596/978-1-4648-1730-4.

World Bank, no date. COVID-19: Impact on Firms. https://www.enterprisesurveys.org/en/covid-19.

CDC, 2020. Disease Threats and Global WASH Killers: Cholera, Typhoid, and Other Waterborne Infections. Atlanta, GA: Centers for Disease Control and Prevention (CDC). https://www.cdc.gov/healthywater/global/WASH.html.

Crowley, L., 2017. Out of Order: WaterAid Reveals Where in the World is Hardest for Women to Find a Toilet. https://www.wateraid.org/media/out-of-order-wateraid-reveals-where-in-the-world-is-hardest-for-women-to-find-a-toilet.

GSMA, 2019. State of the Mobile Connectivity. London: GSM Association (GSMA). https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2019/07/GSMA-State-of-Mobile-Internet-Connectivity-Report-2019.pdf.

IRC, 2021. How Women Gain Power Investing in Water. Stichting IRC International Water and Sanitation Centre (IRC). https://www.ircwash.org/blog/how-women-gain-power-investing-water.

Mastercard, 2018. Pay-As-You-Go and the Internet of Things: Driving a New Wave of Financial Inclusion in the Developing World. https://newsroom.mastercard.com/wp-content/uploads/2018/05/180652_MC_PAYG_Whitepp_9.pdf.

Morais, C., and White, Z., 2020. Scaling Digital Solutions in the Water Sector: Lessons from CityTaps and Wonderkid. London: GSM Association. https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2020/12/Scaling-Digital-Solutions-in-the-Water-Sector-Lessons-from-CityTaps-and-Wonderkid.pdf.

Njoroge, B., 2021. Using Digital Tools to Improve the Commercial Sustainability of Container-Based Sanitation Models. GSM Association. https://www.gsma.com/mobilefordevelopment/blog/using-digital-tools-to-improve-the-commercial-sustainability-of-container-based-sanitation-models.

OECD, 2021. Chapter 7. Women and SDG 6 – Clean Water and Sanitation: Ensure Availability and Sustainable Management of Water and Sanitation for All. In: *Gender and the Environment: Building Evidence and Policies to Achieve the SDGs*. Paris: Organisation for Economic Co-operation and Development (OECD). https://www.oecd-ilibrary.org/sites/f315deeb-en/index.html?itemId=/content/component/f315deeb-en.

Ritchie, H., and Rose, M., 2021. Clean Water. Unsafe Water Sources are Responsible for 1.2 million Deaths Each Year. Our World in Data. https://ourworldindata.org/water-access#unsafe-water-is-a-leading-risk-factor-for-death.

Sanenergy, 2022. Bold Solution for booming cities. The Urban Sanitation Challenge. https://www.sanergy.com/approach/.

Sippy, P., and Dugange, A., 2018. One Token Changing the Game for Sustainable Rural Water Supply in Tanzania. WaterAid. https://washmatters.wateraid.org/blog/one-token-changing-the-game-for-sustainable-rural-water-supply-in-tanzania.

UNICEF, 2016. Collecting Water is Often a Colossal Waste of Time for Women and Girls. United Nations Children's Fund (UNICEF). https://www.unicef.org/press-releases/unicef-collecting-water-often-colossal-waste-time-women-and-girls.

UNICEF, 2022. Water and the Global Climate Crisis: 10 Things You Should Know. United Nations Children's Fund (UNICEF). https://www.unicef.org/stories/water-and-climate-change-10-things-you-should-know.

United Nations, 2019. Policy Brief for the 2019 High Level Political Forum. Climate Change Adaptation and Resilience and Water, Sanitation and Hygiene: Links Between SDG 13 and SDG 6. https://washmatters.wateraid.org/sites/g/files/jkxoof256/files/climate-change-adaptation-and-resilience-and-water-sanitation-and-hygiene-links-between-sdg-13-and-sdg-6_0.pdf.

UN Women, 2013. Tanzanian Women Bring Safe Drinking Water to Their Communities. https://www.unwomen.org/en/news/stories/2013/3/tanzanian-water-kiosks.

Waldron, D., and Sotirou, A., 2017. Quenching a Thirst: Digital Finance and Sustainable Water Service for All. Washington, DC: Consultative Group to Assist the Poor. https://www.cgap.org/sites/default/files/Brief-Quenching-a-Thirst-Apr-2017.pdf.

Waldron, D., et al., 2019. Testing the Waters: Digital Payments for Water and Sanitation. Washington, DC: Consultative Group to Assist the Poor. https://www.cgap.org/research/publication/testing-waters-digital-payments-water-and-sanitation.

Water.org, 2018. Tanzania's Water and Sanitation Crisis. https://water.org/our-impact/where-we-work/tanzania.

Water.org, 2022. The Water Crisis. https://water.org/our-impact/water-crisis.

Whiting, K.,2021. Cooking with Polluting Fuels is a Silent Killer – Here's What can be Done. World Economic Forum. https://www.weforum.org/agenda/2021/10/polluting-cooking-fuels-deaths-women-climate.

WHO, 2021. Progress on Household Drinking Water, Sanitation and Hygiene 2000–2020: Five Years into the SDGs. Geneva: World Health Organization (WHO). https://www.who.int/publications/i/item/9789240030848.

WHO, 2022. WHO Publishes New Global Data on the Use of Clean and Polluting Fuels for Cooking by Fuel Type. https://www.who.int/news/item/20-01-2022-who-publishes-new-global-data-on-the-use-of-clean-and-polluting-fuels-for-cooking-by-fuel-type.

WHO and UNICEF, 2017. Progress on Drinking Water, Sanitation and Hygiene: 2017 Update and SDG Baselines. World Health Organization (WHO) and United Nations Children's Fund (UNICEF). https://data.unicef.org/resources/progress-drinking-water-sanitation-hygiene-2017-update-sdg-baselines.

World Bank, 2021. The Global Findex Database 2021: Financial Inclusion, Digital Payments, and Resilience in the Age of COVID-19. https://www.worldbank.org/en/publication/globalfindex.

Aevarsdottir, A.M., Barton, N., and Bold, T., 2017. The Impacts of Rural Electrification on Labor Supply, Income and Health: Experimental Evidence with Solar Lamps in Tanzania. International Growth Centre. https://www.theigc.org/wp-content/uploads/2018/02/Aevarsdottir-et-al-2017-final-report.pdf.

Borst, R., et al., 2021. How a New Set of Metrics is Poised to Transform PAYGo Solar. Consultative Group to Assist the Poor. https://www.cgap.org/blog/how-new-set-metrics-poised-transform-paygo-solar.

Cozzi, L., Tonolo, G., and Wetzel, D., 2021. The Pandemic Continues to Slow Progress Towards Universal Energy Access. International Energy Authority. https://www.iea.org/commentaries/the-pandemic-continues-to-slow-progress-towards-universal-energy-access.

Faz, X., Khaki, N., and Mattern, M., 2022. As PAYGo Solar Matures, Funders Can Do More to Close the Energy Gap. Consultative Group to Assist the Poor. https://www.cgap.org/blog/paygo-solar-matures-funders-can-do-more-close-energy-gap.

GSMA, 2018. The IPN Hub: Exploring its Utility Beyond Pay-As-You-Go Solar. London: GSM Association (GSMA). https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2018/09/GSMA-IPN-Hub-Exploring-its-utility-beyond-PAYG-solar.pdf.

GSMA, 2021. State of the Industry Report on Mobile Money. London: GSM Association (GSMA). https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2021/03/GSMA_State-of-the-Industry-Report-on-Mobile-Money-2021_Full-report.pdf.

GOGLA, 2021. Global Off-Grid Solar Market Report Semi-Annual Sales and Impact Data. https://www.gogla.org/sites/default/files/resource_docs/gogla_sales-and-impact-reporth2-2021_def2.pdf.

IEA, 2022. The COVID Pandemic has Slowed Progress Towards Sustainable Energy Goals Even as Renewables Continue to Gain Ground. International Energy Authority (IEA). https://www.iea.org/news/the-covid-pandemic-has-slowed-progress-towards-sustainable-energy-goals-even-as-renewables-continue-to-gain-ground.

IEA, et al., 2021. Tracking SDG 7: The Energy Progress Report. World Bank. https://trackingsdg7.esmap.org/data/files/download-documents/sdg7-report2022-full_report.pdf.

IRENA, 2020. Pay-As-You-Go Models: Innovation Landscape Brief. International Renewable Energy Agency (IRENA). https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Jul/IRENA_Pay-as-you-go_models_2020.pdf.

Jackson, T., 2021. PEG Africa has Emerged as the Largest Provider of Financed Solar Water Pumps in West Africa. Disrupt Africa. https://disrupt-africa.com/2021/02/17/peg-africa-has-emerged-as-the-largest-provider-of-financed-solar-water-pumps-in-west-africa.

Kumaraswamy, S.K., 2021. Does PAYGo Solar Improve Women's Lives? A Look at the Evidence. Consultative Group to Assist the Poor. https://www.cgap.org/blog/does-paygo-solar-improve-womens-lives-look-evidence.

M-KOPA, 2022. M-KOPA Secures $75M Growth Equity Round. Press release. M-KOPA Kenya. https://m-kopa.com/m-kopa-secures-75m-growth-equity-round.

Tellez, C., Waldron, D., and Chaintreau, M., 2017. The Fight for Light: Improving Energy Access through Digital Payments. https://btca-production-site.s3.amazonaws.com/documents/291/english_attachments/Full-Energy-Case-Study.pdf?1499786348.

UNFCCC, 2017. Using Pay-As-You-Go Solar Home Systems in Sub-Saharan Africa. https://unfccc.int/news/using-pay-as-you-go-solar-home-systems-in-sub-saharan-africa.

UNFCCC, no date. Azuri PayGo Energy. United Nations Framework Convention on Climate Change (UNFCCC). https://unfccc.int/climate-action/momentum-for-change/financing-for-climate-friendly/azuri-paygo-energy.

United Nations, 2022. COVID-19 Slows Progress Towards Universal Energy Access. https://www.un.org/sustainabledevelopment/blog/2022/06/report-covid-19-slows-progress-towards-universal-energy-access/.

Waldron, D., and Sotiriou, A., 2018. Digital Finance for the Real Economy: Energy. Consultative Group to Assist the Poor. https://www.cgap.org/research/reading-deck/digital-finance-real-economy-energy.

Bancoprovincia, 2022. DNI Account Exceeded 5 Million Users. https://www.bancoprovincia.com.ar/Noticias/MasNoticias/cuenta-dni-supero-los-5-millones-de-personas-usuarias-895.

BTCA, 2021a. Promoting Decent Work by Digitizing Wages Responsibly in Jordan. New York: Better Than Cash Alliance (BTCA). https://btca-production-site.s3.amazonaws.com/documents/652/english_attachments/Promoting_Decent_Work_by_Digitizing_Wages_Responsibly_in_Jordan_Exec_Summary.pdf?1634924507.

BTCA, 2021b. Reaching Financial Equality for Women. New York: Better Than Cash Alliance (BTCA). https://www.betterthancash.org/alliance-reports/reaching-financial-equality-for-women.

BTCA, 2022a. Three Key Findings that Show that Financial Equality is Within Reach in our Lifetime. Better Than Cash Alliance (BTCA). https://www.betterthancash.org/news/three-key-findings-that-show-that-financial-equality-is-within-reach-in-our-lifetime.

BTCA, 2022b. How to Scale Up Digital Wages in Line with the UN Principles for Responsible Digital Payments. Better Than Cash Alliance (BTCA). https://www.betterthancash.org/news/learning-series-how-to-scale-up-digital-wages-in-line-with-the-un-principles-for-responsible-digital-payments.

Field, E., et al., 2021. On Her Own Account: How Strengthening Women's Financial Control Impacts Labor Supply and Gender Norms. *American Economic Review*, vol. 111, no. 7, pp. 2342–2375. https://www.aeaweb.org/articles?id=10.1257/aer.20200705.

Global Partnership for Financial Inclusion, 2020. Promoting Digital and Innovative SME Financing, Washington, DC: International Bank for Reconstruction and Development/World Bank. https://www.gpfi.org/sites/gpfi/files/saudi_digitalSME.pdf.

GoJek, 2022. GoJek Factsheet. https://lelogama.go-jek.com/EN_H1_2022_Gojek_Fact_Sheet.pdf.

IDH, no date. Roadmap on Living Income: A Platform to Guide Company Action to Close Living Income Gaps in Supply Chains. https://www.idhsustainabletrade.com/roadmap-on-living-income.

IFC and EC, 2020. MYBank's Gender-Driven Approach to Lending. International Finance Corporation (IFC) and European Commission (EC). https://www.ifc.org/wps/wcm/connect/3e0cfba8-12c9-42fe-943b-e99f4a36de73/202008_D2E_MyBank.pdf?MOD=AJPERES&CVID=nfvyYCR.

ILO, 2019. The Power of Small: Unlocking the Potential of SMEs. International Labour Organization (ILO). https://www.ilo.org/infostories/en-GB/Stories/Employment/SMEs#intro.

ILO, 2021. Advancing Decent Work through Digital Wage Payments. Geneva: International Labour Organization (ILO). https://sdgs.un.org/sites/default/files/2021-05/STI%20Forum%20Side%20Event%20Summary%20Advancing%20Decent%20Work.pdf.

ILO, no date. Goal #8: Decent Work and Economic Growth. International Labour Organization (ILO). https://www.ilo.org/global/topics/sdg-2030/goal-8/lang--en/index.htm.

Mastercard Center for Inclusive Growth, 2020. Digitizing for Inclusion: Insights from Wage Digitization in the Garment Sector. https://www.bsr.org/reports/BSR-Mastercard-Digitizing-for-Inclusion.pdf.

Mercy Corps Ventures, 2021. Why we Invested: ImaliPay. https://medium.com/mercy-corps-social-venture-fund/why-we-invested-imalipay-ada74bbc914d.

Murthy, G., and Deshpande, R., 2022. How Can Financial Services Support Platform Work? Insights from Five Emerging Markets. Washington, DC: Consultative Group to Assist the Poor. https://www.cgap.org/sites/default/files/publications/2022_05_Focus_Note_Platforms.pdf.

Nurhaliza, S., and Adji, R., 2021. Gojek Supports Ministry in Digitizing 30 Million MSMEs. Antara Indonesian News Agency. https://en.antaranews.com/news/183694/gojek-supports-ministry-in-digitizing-30-million-msmes.

Roest, J., and Bin-Humam, Y., 2021. Business Her Own Way: Creating Livelihoods Through Informal Online Commerce. Washington, DC: Consultative Group to Assist the Poor. https://www.cgap.org/research/publication/business-her-own-way-creating-livelihoods-through-informal-online-commerce.

Saffarian, N., 2022. Accelerating Digital Transformation: Why Technology is the Key to Eliminating the MSME Finance Gap in Emerging Markets. https://www.opportunitynetwork.com/insights/digital-transformation-to-eliminate-msme-finance-gap.

SME Finance Forum, no date. MSME Finance Gap. https://www.smefinanceforum.org/data-sites/msme-finance-gap.

World Bank, 2021. Global Findex Database 2021: Financial Inclusion, Digital Payments, and Resilience in the Age of COVID-19. https://www.worldbank.org/en/publication/globalfindex.

World Bank, 2022. Female Labor Force Participation. https://genderdata.worldbank.org/data-stories/flfp-data-story.

World Bank, no date. Small and Medium Enterprises (SMEs) Finance. https://www.worldbank.org/en/topic/smefinance.

Albaz, A., et al., 2020. Unlocking Growth in Small and Medium-Size Enterprises. McKinsey & Company. https://www.mckinsey.com/industries/public-and-social-sector/our-insights/unlocking-growth-in-small-and-medium-size-enterprises.

BTCA, 2021a. Digitizing Workers Payments for Economic Recovery and Decent Work: Example of Senegal. New York: Better Than Cash Alliance (BTCA). https://btca-production-site.s3.amazonaws.com/documents/606/english_attachments/Digitizing_workers_payments_for_economic_recovery_and_decent_work.pdf?1618604014.

BTCA, 2021b. The Future of Supply Chains Why Companies Are Digitizing Payments. New York: Better Than Cash Alliance (BTCA). https://btca-production-site.s3.amazonaws.com/documents/360/english_attachments/Better_Than_Cash_Alliance-The_Future_of_Supply_Chains-Why_Companies_are_Digitizing_Payments.pdf?1537974289.

BTCA, 2021c. UN Principles for Responsible Digital Payments. New York: Better Than Cash Alliance (BTCA). https://responsiblepayments.org/pdfs/UN-ResponsiblePayments.pdf.

Carrière-Swallow, Y., Haksar, V., and Patnam, M., 2021. Stacking Up Financial Inclusion Gains in India. Washington, DC: International Monetary Fund. https://www.imf.org/external/pubs/ft/fandd/2021/07/india-stack-financial-access-and-digital-inclusion.htm.

Deloitte, 2018. SME Digital Payments: New Opportunities to Optimise. https://www2.deloitte.com/content/dam/Deloitte/au/Documents/financial-services/deloitte-au-fs-sme-digital-payments-270218.pdf.

Frost, J., et al., 2019. BigTech and the Changing Structure of Financial Intermediation, BIS Working Paper, no. 779. Basel: Bank for International Settlements. https://www.bis.org/publ/work779.htm.

Gamser, M. and Chen, M., 2022. Innovating Financial Products and Services for MSMEs Beyond Credit. SME Finance Forum. https://www.smefinanceforum.org/post/innovating-financial-products-and-services-for-msmes-beyond-credit-m.

GPFI, 2017. Climate Smart Financing for Rural MSMEs: Enabling Policy Frameworks. https://www.gpfi.org/sites/gpfi/files/documents/08%20GPFI%20-%20Policy%20Paper%20Climate%20smart%20financing%20for%20rural%20MSMEs_0.pdf.

GPFI, 2020. Promoting Digital and Innovative SME Financing. Global Partnership for Financial Inclusion (GPFI). https://www.gpfi.org/sites/gpfi/files/saudi_digitalSME.pdf.

Hau, H., et al., 2021. FinTech Credit and Entrepreneurial Growth. Swiss Finance Institute Research Paper, no. 21–47. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3899863.

Karr, J., Loh, K., and Wirjo, A., 2020. Supporting MSMEs' Digitalization Amid COVID-19, APEC Policy Support Unit Policy Brief, no. 35. Asia-Pacific Economic Cooperation. https://www.apec.org/docs/default-source/Publications/2020/7/Supporting-MSMEs-Digitalization-Amid-COVID-19/220_PSU_Supporting-MSMEs-Digitalization-Amid-COVID-19.pdf.

OECD, 2020. Evolution and Trends in SME Finance Policies Since the Global Financial Crisis. Paris: Organisation for Economic Co-operation and Development (OECD). https://www.oecd.org/industry/smes/Trends-SME-Finance-Policy-July-2020.pdf.

OECD, no date. Small Businesses, Job Creation and Growth: Facts, Obstacles and Best Practices. Paris: Organisation for Economic Co-operation and Development (OECD). https://www.oecd.org/cfe/smes/2090740.pdf.

Pasricha, N., and Baur-Yazbeck, S., 2020. How Financial Services Can Help the Poor in the Climate Transition. Consultative Group to Assist the Poor. https://www.cgap.org/blog/how-financial-services-can-help-poor-climate-transition.

SME Finance Forum., no date. MSME Finance Gap https://www.smefinanceforum.org/data-sites/msme-finance-gap.

Sun, T., et al., 2021. Digital Banking Support to Small Businesses Amid COVID-19: Evidence from China. *Global Financial Stability Notes*, vol. 2021, issue 002, International Monetary Fund. https://www.elibrary.imf.org/view/journals/065/2021/002/article-A001-en.xml.

Theuri, P., 2020. Coronavirus Pandemic Spurs Uptake in Online Payments. *The Standard*. https://www.standardmedia.co.ke/article/2001375030/ondeng-time-to-prioritise-online-payments.

United Nations, 2022. SDG Progress Report 2022. New York: United Nations. https://unstats.un.org/sdgs/report/2022/.

Visa, 2021. Unlocking the Benefits of Digital Payments for Micro & Small Businesses: Insights from Mexico. https://usa.visa.com/dam/VCOM/regional/na/us/about-visa/documents/unlocking-the-benefits-of-digital-payments-insights-from-mexico.pdf.

Agarwal, S., et al., 2021. Learning Through Social Networks: How Workers Optimize the use of Fintech for Remittances. KAIST College of Business Working Paper. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3927132.

Haseeb, A., and Cowan, B., 2021. Mobile Money and Healthcare Use: Evidence from East Africa. *World Development*, vol. 141, May: 105392. https://doi.org/10.1016/j.worlddev.2021.105392.

IFAD, 2022. 12 Reasons Why Remittances are Important. International Fund for Agricultural Development (IFAD). https://www.ifad.org/en/web/latest/-/12-reasons-why-remittances-are-important.

IMF, 2021. Linking Climate and Inequality. Washington, DC: International Monetary Fund (IMF). https://www.imf.org/en/Publications/fandd/issues/2021/09/climate-change-and-inequality-guivarch-mejean-taconet.

Jack, W., and Suri, T., 2016. The Long-Run Poverty and Gender Impacts of Mobile Money. *Science*, vol. 354, Issue 6317, pages 1298–1292. https://www.science.org/doi/10.1126/science.aah5309.

Lee, J.N., et al., 2021. Poverty and Migration in the Digital Age: Experimental Evidence on Mobile Banking in Bangladesh. *American Economic Journal: Applied Economics*, vol. 13, no. 1, pp. 38–71.

Mahler, D.G., et al., 2021. Updated Estimates of the Impact of COVID-19 on Global Poverty: Turning the Corner on the Pandemic in 2021? World Bank. https://blogs.worldbank.org/opendata/updated-estimates-impact-covid-19-global-poverty-turning-corner-pandemic-2021.

Nicoli, M., and Ahmed, U, 2019. How Digital Remittances Can Help Drive Sustainable Development. World Bank. https://blogs.worldbank.org/psd/how-digital-remittances-can-help-drive-sustainable-development.

Nishant, Y., Lakner, C., and Gerszon Mahler, D., 2021. Is COVID-19 Increasing Global Inequality? World Bank. https://blogs.worldbank.org/opendata/covid-19-increasing-global-inequality.

Putman, D., Mazer, R., and Blackmon, W., 2021. Competition Authority of Kenya Digital Credit Market Inquiry. Innovations for Poverty Action. https://www.poverty-action.org/publication/competition-authority-kenya-digital-credit-market-inquiry.

Ratha, D., 2015. Why We Need to Cut Remittance Fees Now. World Economic Forum. https://www.weforum.org/agenda/2015/03/why-we-need-to-cut-remittance-fees-now.

Somville, V., and Vandewalle, L., 2018. Saving by Default: Evidence from a Field Experiment in Rural India. *American Economic Journal: Applied Economics*, vol. 10, no. 3, pp. 39–66. https://www.aeaweb.org/articles?id=10.1257/app.20160547&&from=f.

World Bank, 2020. Digital Financial Services. Washington, DC: World Bank. https://pubdocs.worldbank.org/en/230281588169110691/Digital-Financial-Services.pdf.

World Bank, 2022a. World Development Report 2022: Finance for an Equitable Recovery. Washington, DC: World Bank. https://www.worldbank.org/en/publication/wdr2022.

World Bank, 2022b. Remittance Prices Worldwide: Making Markets More Transparent. https://remittanceprices.worldbank.org/.

Arroyo, F., and Niina, K., 2021. Transforming Public Transport in Africa: Are Automated Fare Systems the Answer? World Bank. https://blogs.worldbank.org/transport/transforming-public-transport-africa-are-automated-fare-systems-answer.

Baker, J., and Watanabe, M., 2017. Unlocking the Philippines' Urbanization Potential. World Bank. https://blogs.worldbank.org/eastasiapacific/unlocking-the-philippines-urbanization-potential.

Iqbal, S., 2016. A Public-Private Partnership to Digitize Bus Fares in Rwanda. Consultative Group to Assist the Poor. https://www.cgap.org/blog/public-private-partnership-digitize-bus-fares-rwanda.

NPCI, no date. National Electronic Toll Collection (NETC) FASTag. https://www.npci.org.in/what-we-do/netc-fastag/product-overview.

PIB, 2021. Toll Collection after Introduction of Fastags. https://pib.gov.in/PressReleasePage.aspx?PRID=1781653.

Rodriguez, C., and Peralta Quiros, T., 2016. An Evaluation of Bogota's Pro-Poor Transport Subsidies – How effective are they? World Bank. https://blogs.worldbank.org/transport/evaluation-bogota-s-pro-poor-transport-subsidies-how-effective-are-they.

Tang, C., Ceder, A., and Ge, Y.-E., 2018. Optimal Public-Transport Operational Strategies to Reduce Cost and Vehicle's Emission. *PLOS ONE*, vol. 13, no. 8: e0201138. https://doi.org/10.1371/journal.pone.0201138.

Tellez-Merchan, C., and Waldron, D., 2018. For Whom the Cash Tolls. Better than Cash Alliance. https://www.betterthancash.org/news/for-whom-the-cash-tolls.

United Nations, 2022. The Sustainable Development Goals Report 2022. New York: United Nations. https://unstats.un.org/sdgs/report/2022/The-Sustainable-Development-Goals-Report-2022.pdf.

Visa, 2021. The Rise of Digital Remittances: How Innovation is Improving Global Money Movement. https://usa.visa.com/content/dam/VCOM/global/ms/documents/veei-the-rise-of-digital-remittances.pdf.

Aggarwal, V., et. al., 2020. Things We Learned from Kenyan farmers During COVID-19: And What This Means for Future Crises. 60 Decibels. https://60decibels.com/user/pages/07.Work/_farmer_report/60dB_Eight_Things_We_Learned_From_Kenyan_Farmers.pdf.

Anderson, J., Coetzee, G., and Mattern, M., 2021. Financial Solutions for Women in Rural and Agricultural Livelihoods: Evidence and Strategy. Washington, DC: Consultative Group to Assist the Poor. https://www.cgap.org/sites/default/files/publications/slidedeck/2021_11_Slide_Deck_WIRAL_Financial_Solutions.pdf.

Baur-Yazbeck, S., and Pasricha, N., 2021. Inclusive Finance Can Help the World Achieve COP26 Goals – Here's How. Consultative Group to Assist the Poor. https://www.cgap.org/blog/inclusive-finance-can-help-world-achieve-cop26-goals-heres-how.

Businesswire, 2021. Over 600 Million People Planted More Than 326 Million Trees via Alipay Ant Forest in Five Years. https://www.businesswire.com/news/home/20210825005340/en.

Calderone, M., Weingärtner, L., and Kroessin, M.R., 2019. Investing in Financial Inclusion for Climate Resilience and Adaptation: The Role of Islamic Financial Services. London: Overseas Development Institute. https://cdn.odi.org/media/documents/12685.pdf.

Chapagain, D., et al., 2020. Climate Change Adaptation Costs in Developing Countries: Insights from Existing Estimates. *Climate and Development*, vol. 12, issue 10, pp. 934–942. https://doi.org/10.1080/17565529.2020.1711698.

CIF, 2021. Supporting the Just Transition to Allow Carbon and Climate Resilient Future. Climate Investment Funds (CIF). https://www.climateinvestmentfunds.org/sites/cif_enc/files/meeting-documents/joint_ctf-scf_tfc.24_8_discussion_paper_supporting_just_transition.pdf.

IIED, 2021. Digital Technologies for an Inclusive, Low-Carbon Future that Puts People First. London: International Institute for Environment and Development (IIED). https://pubs.iied.org/sites/default/files/pdfs/2021-02/17775IIED.pdf.

IPCC, 2022. Climate Change, 2022: Impacts, Adaptation and Vulnerability. Intergovernmental Panel on Climate Change (IPCC). https://www.ipcc.ch/report/ar6/wg2.

Karelia, G., 2021. Moved by their Plight, Varanasi Man Helps 1700 Rickshaw Pullers Buy E-vehicles. The Better India. https://www.thebetterindia.com/247240/smv-green-solutions-uttar-pradesh-electric-vehicles-marginalised-community-rickshaw-pullers-women-empowerment-gop94.

Koyama, N., et al., 2021. Digital Agriculture Platform Blueprints. Mercy Corps AgriFin. https://www.mercycorpsagrifin.org/wp-content/uploads/2021/01/GIZ_AgriFin_WhitePaper2.pdf.

Liu, H., et al., 2022. Impact of Green financing, FinTech, and Financial Inclusion on Energy Efficiency. *Environmental Science and Pollution Research*, vol. 29, pp. 18955–18966. https://doi.org/10.1007/s11356-021-16949-x.

Lopez, M., 2019. Harnessing the Power of Mobile Money to Achieve the Sustainable Development Goals. London: GSM Association. https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2019/10/GSMA-Harnessing-the-power-of-mobile-money-to-achieve-the-SDGs.pdf.

Naughton, J.M., and Brady, A.K., 2022. Building Resilience to Crisis Through Digital Financial Services with a Gender Lens. *Enterprise Development & Microfinance*, vol. 33, issue 1. https://practicalactionpublishing.com/article/3077/building-resilience-to-crisis-through-digital-financial-services-with-a-gender-lens.

Njiraini, J., 2021. OKO Finance is Delivering Crop Insurance to Cushion Mali's Farmers from Climate Change. AgFunderNews. https://agfundernews.com/oko-finance-is-delivering-crop-insurance-to-cushion-malis-farmers-from-intensifying-weather-patterns.

Pasricha, N., and Baur-Yazbeck, S., 2020. How Financial Services Can Help the Poor in the Climate Transition. Consultative Group to Assist the Poor. https://www.cgap.org/blog/how-financial-services-can-help-poor-climate-transition.

Paulson Institute Green Finance Center and the Research Center for Green Finance Development of Tsinghua University, 2020. Fintech Facilitates the Sustainable Development of Green Finance in China: Cases and Outlook. Washington, DC: Paulson Institute. http://www.paulsoninstitute.org/wp-content/uploads/2020/09/Fintech-report_Final1.pdf.

Quiñones, L., 2021. Women Bear the Brunt of the Climate Crisis, COP26 Highlights. UN News. United Nations. https://news.un.org/en/story/2021/11/1105322.

Riley, E. 2018. Mobile Money and Risk Sharing Against Village Shocks. *Journal of Development Economics*, vol. 135, pp. 43–58. https://doi.org/10.1016/j.jdeveco.2018.06.015.

reNature, 2021. reNature Generates First Agroforestry Carbon Credits in Brazil with Rabobank. https://www.renature.co/articles/renature-generates-first-agroforestry-carbon-credits-in-brazil-with-rabobank.

SunFunder, 2021. Groundbreaking $11m Syndication for SunCulture to Expand Solar Irrigation. https://www.sunfunder.com/post/groundbreaking-11m-syndication-for-sunculture-to-expand-solar-irrigation.

UNDP, 2017. Gender and Climate Change. New York: United Nations Development Programme (UNDP). https://www.undp.org/publications/gender-and-climate-change#modal-publication-download.

UNDRR, 2022. Our World at Risk: Transforming Governance for a Resilient Future. United Nations Office for Disaster Risk Reduction (UNDRR). https://www.undrr.org/gar2022-our-world-risk.

UNEP, 2019. Digital Finance and Citizen Action in Financing the Future of Climate-Smart Infrastructure. Nairobi: United Nations Environment Programme (UNEP). https://www.oecd.org/environment/cc/climate-futures/case-study-digital-finance-and-citizen-action.pdf.

UNFCCC, no date. Alipay Ant Forest: Using Digital Technologies to Scale up Climate Action. United Nations Framework Convention on Climate Change (UNFCCC). https://unfccc.int/climate-action/momentum-for-change/planetary-health/alipay-ant-forest.

Bachas, P., Kondylis, F., and Loeser, J., 2021. Increasing Tax Revenue in Developing Countries. World Bank. https://blogs.worldbank.org/impactevaluations/increasing-tax-revenue-developing-countries.

BTCA, 2020. Success Factors in Tax Digitalization. New York: Better Than Cash Alliance (BTCA). https://btca-production-site.s3.amazonaws.com/documents/501/english_attachments/Success_Factors_in_Tax_Digitalization_full.pdf?1606759509.

Chehade, N., Tolzmann, M., and Notta, S., 2021. Inclusive Finance in Fragile Countries: Advancing a Vital Agenda. https://www.cgap.org/blog/inclusive-finance-fragile-countries-advancing-vital-agenda.

Costella, C., et al., 2021. Social Protection and Climate Change: Scaling Up Ambition. https://socialprotection.org/sites/default/files/publications_files/Paper%20-%20Social%20Protection%20and%20Climate%20Change_%20Scaling%20up%20Ambition%20%282%29.pdf.

Cunningham, S., Davis, J., and Dohrmann, T., 2018. The Trillion-Dollar Prize: Plugging Government Revenue Leaks with Advanced Analytics. McKinsey & Company. https://www.mckinsey.com/industries/public-and-social-sector/our-insights/the-trillion-dollar-prize-plugging-government-revenue-leaks-with-advanced-analytics.

Fichers, N., and Naji, L., 2020. Digitalising Person-to-Government Payments: Leveraging Mobile to Improve Government Revenue and Access to Public Services. London: GSM Association. https://www.gsma.com/publicpolicy/wp-content/uploads/2020/09/GSMA-Digitalising-person-to-government-payments.pdf.

Gentilini, U., et al., 2021. Social Protection and Jobs Responses to COVID-19: A Real-Time Review of Country Measures. World Bank. https://openknowledge.worldbank.org/handle/10986/33635.

Hall, S., 2022. 4 Things to Know About Financial Inclusion Around the World Right Now. World Economic Forum. https://www.weforum.org/agenda/2022/07/global-digital-financial-inclusion-findex.

Hare, A., and Parekh, N., 2020. Should Government Payments be Digitized?. J-PAL. https://www.povertyactionlab.org/blog/10-13-20/should-government-payments-be-digitized.

ILO, 2018. Women and Men in the Informal Economy: A Statistical Picture. Third edition. Geneva: International Labour Organization (ILO). https://www.ilo.org/global/publications/books/WCMS_626831/lang--en/index.htm.

Jain, A., et al., 2021. A Review of the Effectiveness of India's Direct Benefit Transfer (DBT) System During COVID-19: Lessons for India and the World. MicroSave Consulting. https://www.microsave.net/2021/10/13/a-review-of-the-effectiveness-of-indias-direct-benefit-transfer-system-during-covid-19-lessons-for-india-and-the-world-2.

Manyika, J., et al., 2016. How Digital Finance Could Boost Growth in Emerging Economies. McKinsey Global Institute. https://www.mckinsey.com/featured-insights/employment-and-growth/ how-digital-finance-could-boost-growth-in-emerging-economies.

Miller, M., et al., 2020. How Can Digital Financial Services Help a World Coping with COVID-19?. World Bank. https://blogs.worldbank.org/psd/how-can-digital-financial-services-help-world-coping-covid-19#:~:text=Digital%20payments%20help%20formalize%20SMEs,of%20government%20payments%20for%20women.

Santiso, C., 2021. Digitalisation as an Anticorruption Strategy: What are the Integrity Dividends of Going Digital? CAF. https://www.caf.com/en/knowledge/views/2021/08/digitalisation-as-an-anticorruption-strategy-what-are-the-integrity-dividends-of-going-digital.

Setor, T.K., Senyo, P.K., and Addo, A., 2021. Do Digital Payment Transactions Reduce Corruption? Evidence from Developing Countries. *Telematics and Informatics*, vol/ 60, 101577. https://doi.org/10.1016/j.tele.2021.101577.

Transparency International, 2020. Bribery or Personal Connections? When and Why People Pay Bribes or Use Personal Connections. https://www.transparency.org/en/news/bribery-or-personal-connections.

United Nations, 2022. SDG Progress Report 2022. New York: United Nations. https://unstats.un.org/sdgs/report/2022/.

Wald, T., 2018, Governments can Fight Corruption by Joining the Digital Payment Revolution. World Economic Forum. https://www.weforum.org/agenda/2018/04/governments-join-digital-payment-revolution-fight-corruption.

World Bank, 2018. Public Sector Savings and Revenue from Identification Systems: Opportunities and Constraints. Washington, DC: World Bank. https://documents1.worldbank.org/curated/en/745871522848339938/Public-Sector-Savings-and-Revenue-from-Identification-Systems-Opportunities-and-Constraints.pdf.

World Bank, 2021. Global Findex Database 2021: Financial Inclusion, Digital Payments, and Resilience in the Age of COVID-19. https://www.worldbank.org/en/publication/globalfindex.

World Bank, no date. Digital Cash Transfers in the Time of COVID 19: Opportunities and Considerations for Women's Inclusion and Empowerment. Washington, DC: World Bank. https://documents1.worldbank.org/curated/en/378931596643390083/pdf/Digital-Cash-Transfers-in-Times-of-COVID-19-Opportunities-and-Considerations-for-Womens-Inclusion-and-Empowerment.pdf.