# The development potential of remittances using blockchain technology in Nepal

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# Foreword

Remittances have been a stable source of external finance to many lower-middle income countries (LMICs) surpassing foreign direct investment (FDI) and official development assistance (ODA) flows. With USD 554 billion flowing to LMICs in 2019, they are a major vehicle of economic growth. However, the COVID-19 pandemic is set to dramatically dampen these remittance inflows in the short to medium term, threatening the livelihoods of migrants and their families back home, and foreshadowing a deterioration of current accounts.

In that context, innovative digital solutions provide new opportunities for public and private actors to compensate in part the quantitative loss caused the crisis, by improving the financial and development impacts of remittances in countries of origin. This paper reviews the introduction of blockchain technology in the management of remittance flows from the United Arab Emirates to Nepal. Looking specifically at the Finance Against Remittances (FAR) project, it demonstrates how policies centred on this innovative technological solution can help migrants and their families improve their financial resilience. It concludes that the collateralisation of remittances using blockchain technology is a powerful way of rebuilding sustainable and better livelihoods in least developed countries in the context of COVID-19.

This note was prepared by Friederike Rühmann, Sai Aashirvad Konda and Paul Horrocks of the OECD Development Co-operation Directorate (DCD). It provides an overview of diverse perspectives on the intersection of blockchain technology and remittances by exploring the opportunities and challenges of this technology for reducing the cost of remittances. It does not represent the official views of the OECD or of its member countries. The opinions expressed and arguments employed are those of the authors.

This note contributes to the work of the OECD Blockchain Policy Centre which provides a global reference point for helping policy makers to address the challenges raised by blockchain and DLT and to seize the opportunities it offers for achieving policy objectives. For more information see www.oecd.org/daf/blockchain.

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# Abbreviations and acronyms

| | |
|---|---|
| FAR | Finance Against Remittances |
| FDI | Foreign Direct Investment |
| ODA | Official Development Assistance |
| LDCs | Least Developed Countries |
| MiFiX | Multi-interface Financial Exchange |
| UNCDF | United Nations Capital Development Fund |
| WPS | Wages Protection System |
| MTO | Money Transfer Operator |
| EMI | Equated Monthly Instalment |
| LMIC | Low to Middle Income Countries |

# Executive summary

Remittances have been a stable source of external finance to many low to middle income countries (LMICs) surpassing foreign direct investment (FDI) flows and official development assistance (ODA) (Ratha et al., 2020[1]). With USD 554 billion flowing to LMICs in 2019, remittances are an important vehicle of economic growth in developing contexts. The COVID-19 pandemic is set to dramatically dampen remittance flows. At this stage, the long-term effect of COVID-19 is largely unknown. As the world is grappling with unprecedented socio-economic ramifications due to COVID-19, remittances have declined with expectations they will fall by 14% in 2021 (Ong, 2020).

In researching this paper, the OECD conducted interviews with a range of international experts on blockchain technology and remittances to illustrate how blockchain technology can leverage the potential of remittances for the provision of financial services in least developed countries. It focuses on the Finance Against Remittances (FAR) project in Nepal, which demonstrates how policies centred on innovative technological solutions like blockchain can create new opportunities for migrants to improve their financial resilience.

The COVID-19 pandemic has exposed the vulnerabilities of migrant and their families back home. The collateralisation of remittances is a powerful tool for rebuilding sustainable and better livelihoods for migrants in their countries of origin. The host countries benefit from economic development through efforts and work of migrant workers in their economies. Migrants willing to invest are not eligible for credit in the destination countries and are denied credit in their origin countries mainly due to information asymmetry. FAR is a blockchain-based innovation that addresses the data asymmetry and inefficiencies associated with the provision of credit in a home country based on remittances originating from across borders. The creation of digital documentation and formalisation of workers would enable a conducive environment for migration and assist in realising the benefits of migration and remittances for both host and origin countries.

The use of technologies like blockchain could pave the way to advance financial inclusion and amplify the development impact of remittances beyond the cost reduction of remittances. Harnessing the potential of remittances as a source of finance will have multiple benefits for all the stakeholders, which are further outlined in this paper. Technological solutions using blockchain technology can create the trust required for mainstreaming financial institutions to engage in this high social impact space. In particular, the digitisation of identification documents and possible creation of e-Know Your Customer for migrants in host countries would enable them to access and yield the benefits of financial products and services in origin countries.

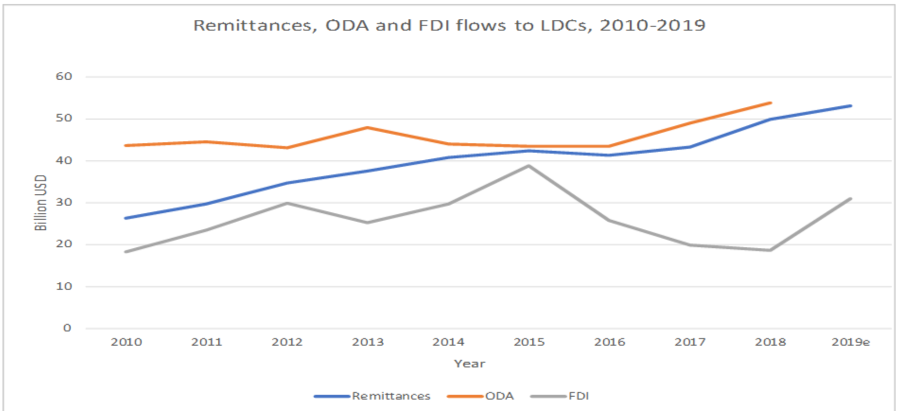
While remittances continue to be an important source of development finance for many developing and least developed economies, governments in both host and origin countries need to ensure that migrants are more resilient to shocks. The encouragement of ideas and solutions like FAR could be a positive step in the right direction and the realisation of benefits demands digitisation and documentation of migrant workers in host countries. The implementation of similar projects in other corridors (e.g. from Europe to Africa) is conditional upon the extent of migrants' documentation in host countries and a well-functioning banking system as well as adequate financial infrastructure in the origin countries. This would be particularly useful in LMICs where it could be most relevant for inclusive growth and financial inclusion.

# 1 The significance of remittances for least developed countries (LDCs)

With USD 554 billion flowing to LMICs in 2019, remittances are an important vehicle of economic growth in developing contexts (Ratha, et al., 2020). Remittances have been a stable source of external finance to many LMICs surpassing foreign direct investment (FDI) flows and official development assistance (ODA) (Ratha, et al., 2020). At this stage, the long-term effect of COVID-19 is largely unknown. As the world is grappling with unprecedented socio-economic ramifications due to COVID-19, remittances have declined with expectations they will fall by 14% in 2021 (Ong, 2020). While in some other corridors remittances have increased since the pandemic, remittances to LMICs are estimated to fall by about USD 110 billion, severing crucial lifeline for many vulnerable households (World Bank, 2020).

Remittances play a significant role in one-third of least developed countries (LDCs) accounting for 7% of global remittances. In 2019, LDCs had received USD 53 billion as remittances, higher than the FDI flows and other private equity flows (Figure 1).

## Figure 1. Remittances, ODA and FDI flows to LDCs, 2010-2019




Source: Authors calculations based on OECD and World Bank data (World Bank, 2020; World Bank, 2020) https://www.worldbank.org/en/topic/migrationremittancesdiasporaissues/brief/migration-remittances-data. https://data.worldbank.org/indicator/BX.KLT.DINV.CD.WD?end=2019&locations=XL&start=2010.

Remittances to LDCs are heterogeneous and uneven in their distribution. The top three recipients among LDCs (Bangladesh, Nepal and Yemen) receive more than half of the USD 53 billion of remittances. The LDC group includes some of the world's top remittance recipients relative to gross domestic product (GDP). For example, in Haiti, South Sudan and Nepal remittances form 37%, 34% and 27% of GDP respectively (World Bank, 2020).

## The impact of remittances in least developed countries

Remittances increase the ability of households in LDCs to afford better education, health, nutrition and they reduce households' vulnerability to risks such as drought, famine and other disasters (UNCTAD, 2012). In terms of poverty reduction and human capital investment in LDCs, remittances undoubtedly exert a positive effect at household level, but their contribution to long-term development through investment is weak (Chami, Fullenkamp, & Jahjah, 2003; Kim, 2007; UNCTAD, 2012). For instance, often in poor households, a large portion of remittances are allocated for day to day consumption and debt repayment. They are not channelled towards productive investments which could increase their wealth and enable a sustainable fall-back mechanism for migrants when they return to their original countries. Additionally, the absence of financial services and investment conducive to a macroeconomic environment in LDCs limits the savings and investment potential of remittances. This could ultimately contribute to poverty alleviation in LDCs, and have been shown to reduce the depth of poverty in Asia, Africa and the Pacific (Brown, 2010; Mashayekh, 2013; UNCTAD, 2012).

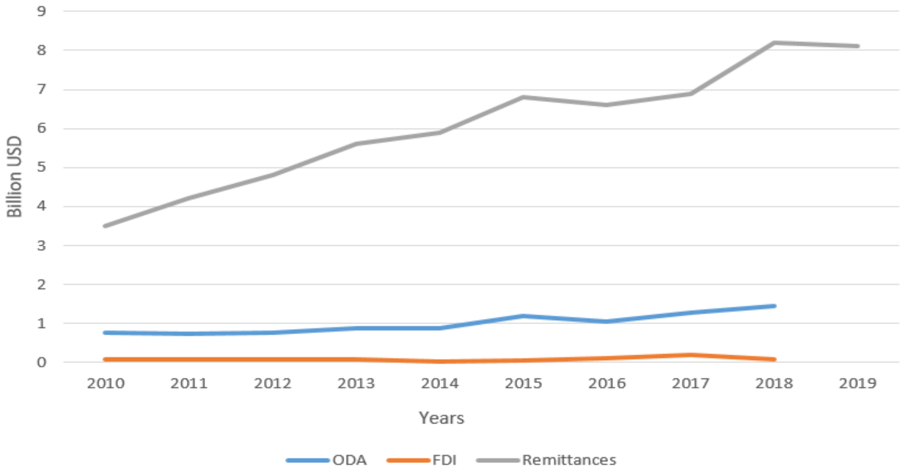
Harnessing the potential of remittances for long-term development in LDCs is therefore crucial. While financial inclusion has improved in recent years, access to finance remains the main bottleneck for sustainable investment. Digital technologies, such as distributed ledger technology (e.g. Blockchain technology) has the potential to make remittance transactions faster, cheaper and to reach areas that are currently difficult to get to or underserved by formal financial systems. (EIB, 2020)

# 2 Migration and remittances trends in Nepal

With about 2 million Nepali migrants across the world, Nepal received USD 8 billion remittances constituting 27.3% of the GDP in 2019 (World Bank, 2020). Remittances are remarkably larger than the FDI and ODA flows to Nepal (Figure 2.1). Following the 2015 earthquake in Nepal, remittances increased to 15% of GDP in 2015 versus 5% in 2014. They increased during other disasters and were helpful mostly for home reconstruction and restoration of damaged livelihoods (Figure 2.2).

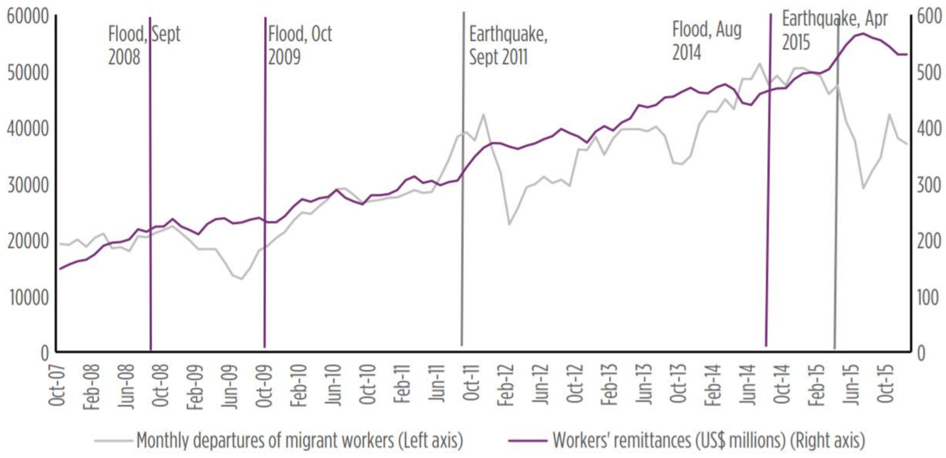
There are around 2 million Nepali migrants across the world; Nepal received USD 8 billion remittances constituting 27.3% of the GDP in 2019.

### Figure 2.1. Remittances, ODA and FDI flows to Nepal




Source: Authors calculation based on World Bank and OECD data (World Bank, 2020; World Bank, 2020), Migration and Remittances Data, https://www.worldbank.org/en/topic/migrationremittancesdiasporaissues/brief/migration-remittances-data. Foreign Direct Investment Net Inflows (BoP, current USD, Least Developed Countries, UN Classification), https://data.worldbank.org/indicator/BX.KLT.DINV.CD.WD?end=2019&locations=XL&start=2010.

**Figure 2.2. Remittances, migration trends and disasters in Nepal**




Source: Migration and Remittances Recent Developments and Outlook. (World Bank.2016)
http://pubdocs.worldbank.org/en/661301460400427908/MigrationandDevelopmentBrief26.pdf

Migration from Nepal is predominantly male; leaving wives and other female family members at home (International Organization for Migration, 2019). Female migrant workers account for less than 5% of the total labour migration (Ministry of Labour, Employment and Social Security, 2020). Since the early 2000s, labour migration (measured by issued work permits) from Nepal is heavily concentrated in Gulf Cooperation Council (GCC) countries and Malaysia[1] (Ministry of Labour, Employment and Social Security, 2020). In 2018-19, the top five destination countries for Nepali migrants were Qatar, United Arab Emirates, Saudi Arabia, Kuwait and Malaysia (Nepal Labour Migration Report 2020, 2020)). Nepali migrants mostly work in low-paying low-skilled jobs and their salaries vary according to occupation (Ministry of Labour, Employment and Social Security, 2020).

## Return and circular migration

The strict lockdown measures amidst the COVID-19 pandemic have severely affected construction, hospitality and manufacturing in host countries resulting in an unprecedented return migration of Nepali migrants. The Nepal association of foreign employment agencies reports that 25-30% jobs held by migrants are lost due to the pandemic, triggering an unprecedented return of 600 000 migrant workers (Mandal, 2020). In the United Arab Emirates, the estimated job loss for Nepali migrants is 30% (Mandal, 2020). The job losses result in the decline of remittances being sent to Nepal and the World Bank estimates that remittances to Nepal would decline by 14% in 2020 (Ratha, et al., 2020). The global economic slowdown and travel restrictions are likely to keep remittances subdued in 2021 (Ratha, et al., 2020).

Migration for temporary/short-term employment is a prominent feature of Nepal's labour migration. Given the temporary and short-term nature of labour migration, both return and circular migration is common in Nepal (Ministry of Labour, Employment and Social Security, 2020). There are approximately 756 000 recent working age returnee migrants in Nepal as of 2018 (Central Bureau of Statistics, 2019).

[1] India is the most popular destination for Nepali migrants however they do not require any work permits to work in India.

Migration for temporary/short-term employment is a salient feature of Nepal's labour migration. Given the temporary and short-term nature of labour migration, both return and circular migration is prominent in Nepal. There are approximately 756 000 recent working age returnee migrants in Nepal as of 2018.

Multiple reasons influence return migration but the most popular reason is completion of contract followed by the search for better job opportunities (Central Bureau of Statistics, 2019; Ministry of Labour, Employment and Social Security, 2020). Permanent return migration is frequent in the case of Nepali migrant workers, with secure gainful employment the most important objective of this (Zwagger & Sintov, 2017). The COVID-19 pandemic has resulted in job losses triggering greater return migration. However, in situations when migrants lack reliable economic integration mechanism they become poorer, indebted and more vulnerable. The migrants want to ensure economic security when they return back to their home countries.

Returnee migrants plan to utilise the skills gained to start and operate businesses but insufficient capital, inadequate infrastructure and an unfavourable business environment hinder the execution of such plans (International Labour Organization, 2016). A main impediment to operating a business is the difficulty in obtaining a bank loan due to strict collateral requirements, lack of access to preferential loans at affordable interest rates and cumbersome procedures (International Labour Organization, 2016; Zwagger & Sintov, 2017). The economic integration of returnee migrants is a challenge but the government intends to utilise the spill-overs of migration and financial remittances to advance the development priorities in Nepal (Ministry of Labour, Employment and Social Security, 2020). Returnee migrants do not have adequate savings because a significant portion of their income (in the first few years) is used for repaying the loans which they have borrowed to finance their migration (International Labour Organization, 2016).

## Costs of migration and source of funds

The process of migration involves expenses like the cost of obtaining a passport, visa fee, fee to employment agency[2], smuggling, bribery, travel costs and medical examination fees. The cost of migration varies by country of employment, but on average a migrant worker has to bear approximately USD 1 372 (NPR 150 000), which is higher than the median annual household income of USD 1 065 (NPR 127 281) according to 2011-12 estimates (International Labour Organization, 2016; Government of Nepal, 2011). Although many households own assets such as farm land, cattle and jewellery, they are reluctant to sell their property and source of livelihood. Owing to high costs, low incomes and lack of willingness to sell/mortgage their assets, many households rely on credit from informal sources to finance their journey. A striking 90% of the labour migrants are dependent on credit to finance their migration (International Labour Organization, 2016).

90% of labour migrants in Nepal are dependent on credit to finance their migration.

[2] Employment agencies are an important channel of migration from Nepal. They charge high fee for assisting migrants in arranging a job and processing paper work (International Labour Organization, 2016).

Borrowing from money lenders as well as relatives or friends is the most preferred source of credit. Banks are not the preferred source for credit due to multiple reasons such as collateral requirement, lack of trust in commercial banking, lack of flexibility in loan repayment, cumbersome procedures for obtaining a loan and other stringent lending requirements (related to proof of employment, identification document for Know Your Customer (KYC) processes (International Labour Organization, 2016; Zwagger & Sintov, 2017). Without any alternative source of formal credit, prospective migrants borrow uncollateralised loans from money lenders at exorbitant interest rates. In Nepal, the average interest of loan from a money lender is 35% and 21% from a friend or relative (Figure 2.4) (International Labour Organization, 2016). Owing to high interest rate loans, remittances are often channelled towards debt repayment during the initial days besides basic consumption. Thus, leaving no, or less resources available for investment.

Borrowing from money lender and relatives or friends is the most preferred source of credit. Without any alternative source of formal credit, prospective migrants borrow uncollateralised loans from money lenders at exorbitant interest rates. In Nepal, the average interest on a loan from a money lender is 35% and 21% from a friend or relative.

**Figure 2.3. Source of funds for migration expenses and interest rates in 2016**

| Source of fund | % of migrants | Interest rate (%) | | | Average distance to bank (km) |
|---|---|---|---|---|---|
| | | Average | Minimum | Maximum | |
| Loan from moneylender | 41.7 | 34.9 | 14.0 | 60.0 | 2.6 |
| Loan from friend or relative | 39.8 | 22.6 | 0.0 | 60.0 | 1.9 |
| Household savings | 6.0 | n/a | n/a | n/a | 2.3 |
| Loan from bank or finance institution* | 5.0 | 17.4 | 13.0 | 25.0 | 2.9 |
| Household income | 3.8 | n/a | n/a | n/a | 2.1 |
| Sale of household assets | 1.9 | n/a | n/a | n/a | 1.8 |
| Loan from employment agency or agents | 1.0 | 33.0 | 24.0 | 36.0 | 1.8 |
| Others | 0.5 | 25.0 | 14.0 | 36.0 | 3.5 |

Source: Promoting informed policy dialogue on migration, remittance and development in Nepal (International Labour Organization, 2016) http://ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---ilo-kathmandu/documents/publication/wcms_541231.pdf

## Limited accessibility to formal credit for investment

A small portion of remittance income is channelled towards investment with real estate being the most preferred one followed by retail and wholesale businesses, agriculture, raising livestock and garment/handicraft manufacturing (Zwagger & Sintov, 2017; International Labour Organization, 2016). Low levels of financial inclusion, financial literacy and loan repayment limits the ability of households to make investments (International Labour Organization, 2016). However, there are barriers for households to stimulate remittances for investment. Households rely heavily on credit as the key source of funds for potential investment but the lack of affordable interest rate loans prevents households from accessing credit (Zwagger & Sintov, 2017). Migrants willing to invest are not eligible for credit in the destination countries and are denied credit in their countries of origin mainly due to information asymmetry. Banks in the origin country[3] cannot verify the source of income (for repayments) originating in some other country

[3] Origin country is the recipient country where the migrant is from.

and do not have adequate information on the migrant's employment status, residence status, legal status and KYC details to offer credit and other financial services (Viswanathan, 2019).

> Migrants willing to invest are not eligible for credit in the destination countries and are denied credit in their origin countries mainly due to information asymmetry.

It is within this context of information asymmetry and the consequent problem in offering credit that FAR leverages a blockchain-based solution to collaterise remittances and securely exchange customer information.

# 3 Collateralisation of remittances through blockchain technology

Finance Against Remittances (FAR) is a blockchain-based innovation that addresses the data asymmetry and inefficiencies associated with the provision of credit. New Street Technologies, a technology company, developed a blockchain based banking ecosystem MiFiX (Multi-interface Financial Exchange) to enable a secure and immutable exchange of information among participants in lending processes. New Street along with Al-Fardan Exchange in the United Arab Emirates, Laxmi Bank in Nepal and United Nations Capital Development Fund (UNCDF) launched FAR in the United Arab Emirates -Nepal corridor to collaterise the flow of remittances and harness the potential of remittances as a source of finance.

The United Arab Emirates is a major destination for Nepali migrants and in 2019, Nepal received USD 136 million from the United Arab Emirates (World Bank, 2019). With 8.3 million migrant population accounting for about 90% of its workforce, the United Arab Emirates has established a salary transfer system. The central bank of the United Arab Emirates developed the Wages Protection System (WPS) that allows the ministry of labour to create a database that records wage payments in the private sector to guarantee the timely and full payment of agreed-upon wages (Ministry of Labour, 2009). WPS is “an electronic salary transfer system that allows companies / institutions to pay workers’ wages via banks, bureaux de change, and financial institutions approved and authorized to provide the service” (Ministry of Labour, 2009). Al-Fardan Exchange is registered under the WPS to disburse wages and thus performs an additional role unlike any other conventional cross-border remittance service provider. The WPS system in the United Arab Emirates is a key element in the FAR project.

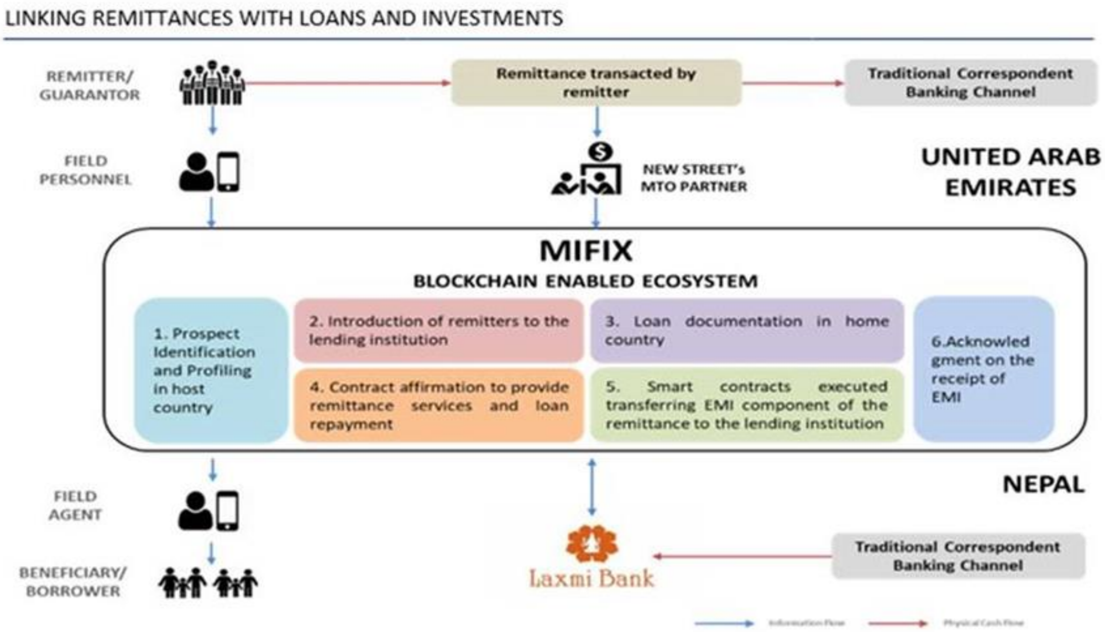
FAR addresses the aforementioned information asymmetry for banks in the origin countries by enabling a secure and immutable exchange of permissioned client information. In this case, this is between Al-Fardan Exchange and Laxmi bank in Nepal, on MiFiX. As a licensed Money Transfer Operator (MTO), Al-Fardan Exchange requires to have, and therefore has access to client information like KYC, employment details, visa status, residence status, company status and salary information from various sources including the WPS. This is all the data that Laxmi Bank requires to create a credit profile for each remitter interested in taking out a loan through their dependents in Nepal. This essential client information is securely exchanged with Laxmi Bank via the blockchain powered MiFiX and the bank is able to verify details and rationalise their lending decisions. Smart contracts executed transferring the EMI component of the remittance to the lending institution. The use of blockchain technology enables trust between the two different entities across borders and makes loan processing efficient. The banks in the home country would have full trust and confidence that data has not been altered in any way.

The use of blockchain technology enables trust between the two different entities across borders and makes loan processing efficient. The banks in the home country would have full trust and confidence that data has not been altered in the way.

The loan process begins in the United Arab Emirates (see Figure 3.1). Any migrant interested in a loan for their dependents in Nepal can contact Al-Fardan Exchange in the United Arab Emirates which then notifies the Laxmi bank in Nepal about this request. The use of blockchain technology for secure cross-border exchange of information allows Laxmi bank to give out loans to borrowers in Nepal based on the employment status, income and remittances history of the Nepali migrant worker in the United Arab Emirates. The decisions about the eligibility of a loan are taken by Laxmi bank. The migrant authorises Al-Fardan to access the required information and share it with Laxmi bank. All the information required is collected digitally from the migrant using web and mobile apps linked to MiFiX to ensure efficiency and transparency in handling of customer data. The migrant notifies his dependent in Nepal who then approaches their nearest Laxmi Bank branch with their own KYC documents and other credentials. Simultaneously, Laxmi bank also contacts the dependent to provide information of documents required and the nearest processing branch. The bank conducts the necessary checks and cross-verifies details on MiFiX to approve the loan after the necessary processing and approvals. MiFiX is also equipped to open the requisite savings and loan accounts on the bank's back-end systems, and disburse the funds to the borrower. Application status notifications are sent throughout the application and disbursement process to both, the remitter and beneficiary. The entire process takes about three days from the time the process is initiated to the time funds are disbursed (see Figure 3.1). The bank checks the profile and credit history of the borrower and mandates opening a savings account. The migrant can now use the savings account to regularly send remittances (i.e. via Al-Fardan Exchange) and a part of the remittance is deducted for Equated Monthly Instalment (EMI)[4]. Remittances might not be sent every month due to high cost but the bank communicates with the borrower and informs them to keep the equivalent EMI amount in the account whenever they receive remittances. Using the MiFiX scorecard engine, the bank can customise any loan product, from mortgages, to automobile loans or collateral free unsecured personal loans.

[4] An Equated Monthly Instalment is a fixed payment amount paid by the borrower to lender every month. EMIs are used to pay off both interest and principal each month so that over a period of time the loan is paid off in full (Kagan, 2020).

## Figure 3.1. MiFiX blockchain based ecosystem




Source: UNCDF 2020

The credit profile and collateralisation of remittances enabled Laxmi bank to take credit decision and offer uncollateralised loans at an interest rate of 14.25%, which is less than that of informal credit according to the ILO (2016[17]): the average interest rate from a money lender is 34% (Promoting informed policy dialogue on migration, remittance and development in Nepal, 2016). The bank gives up to NPR 200 000/migrant (about USD 1 670) without any collateral[5]. The pilot phase of the project which began in November 2019 demonstrated positive results. The project has since scaled up and has over 80 loans worth USD 132 659 in the pipeline, with the majority of the loans being used for house renovation while others have been used for investing in garment shops (e.g. buying a sewing machine) or as working capital for existing businesses[6]. Additionally, 181 migrants (47 female and 134 male) have satisfied the loan criteria worth USD 300 141 by the time COVID-19 hampered the entire process[7].

> The project has since scaled up and has over 80 loans worth USD 132 659 in the pipeline with majority of the loans have being used for house renovation while others have been used for managing garment shops or other businesses.

[5] Information provided by the UNCDF.

[6] Information provided by the UNCDF.

[7] Information provided by the Al-Fardan Exchange, UAE.

## Impact of COVID-19 on FAR and scalability

Although more than 2 000 migrants have expressed their interest in loans worth USD 1.7 million[8] in total, the lockdowns and physical-distancing measures due to the COVID-19 pandemic has hindered the processing and disbursement of loans. Amidst the pandemic, the onboarding of migrants has halted because the migrants and the beneficiaries in the origin country cannot visit money transfer operators and banks respectively for verification. In order to address the problems faced during COVID-19, New Street plans to introduce video KYC features, digital self onboarding and video banking. They also plan to introduce payment to mobile wallets so that the beneficiaries would not have to depend on ATMs[9] or branch visits for withdrawing funds.

Currently, New Street's plans to launch FAR in other corridors such as India-United Arab Emirates, United Arab Emirates -Bangladesh, United Arab Emirates - Philippines, United Arab Emirates - East Africa, other GCC countries-India, Malaysia-Nepal, Malaysia-Bangladesh, Malaysia- Philippines, Europe-Africa, United Kingdom-Africa, United Kingdom-Eastern Europe, United States-Mexico and United States-Latin America. The success of FAR in other corridors depends on establishing partnerships and trust with all the stakeholders. The company intends to intensify its expansion efforts as the COVID-19 related travel restrictions ease. Meanwhile they are continuing their efforts via virtual means.

## Challenges

The idea of leveraging blockchain technology for innovative sources of finance requires further analysis. Although giving uncollateralised loans is risky for banks, Laxmi bank pioneered harnessing technological innovations like blockchain for banking to address the information asymmetry. Moreover, the bank wanted to reach a larger segment of the Nepali rural population and gain their trust. Laxmi Bank's efforts were supported by UNCDF who subsidised the overall project cost by subsidising the cost for the technology. It is also important to highlight that the solution brings advantages in terms of technology, but novel also in its design and structuring. The product design was informed by extensive in-field research, testing and market analysis. This technical assistance was also supported by UNCDF to complementing the technology and ensure customer centricity in the product's overall design and roll-out. This included planned demand-side research that uncovered insights into financial behaviour and preferences of migrant families, which were then combined by UNCDF's consultant to refine the user experience and a marketing plan.

[8] Information provided by the Al-Fardan Exchange, United Arab Emirates.

[9] Information provided by New Street Tech

# Conclusion

Remittances will continue to be an important source of development finance for many developing and least developed economies. The pandemic presents a unique learning opportunity to leverage the potential of remittances. Steps must be taken to embrace innovative digital solutions for the provision of financial services. The use of emerging technologies like blockchain could be a powerful tool to advance financial inclusion and amplify the development impact of remittances beyond the cost reduction of remittances. The collateralisation of remittances could promote sustainable and resilient livelihoods for migrants in their origin countries.

The COVID-19 pandemic has exposed the vulnerabilities of migrant and their families back home. Therefore, governments in both host and origin countries need to ensure that migrants are more resilient to shocks. The encouragement of ideas and solutions like FAR could be a positive step in the right direction and the realisation of benefits demands digitisation and documentation of migrant workers in host countries. Similar projects could be implemented in other remittances corridors more widely to encourage financial inclusion, in particular in LDCs. The digitisation of identification documents and possible creation of e-KYC for migrants in host countries would enable them to access and yield the benefits of financial products and services in origin countries. The implementation of similar projects in other LDCs corridors (e.g. from Europe to Africa) is conditional upon the extent of migrants' documentation in host countries and a well-functioning banking system as well as adequate financial infrastructure in the origin countries.

Harnessing the potential of remittances as a source of finance will have multiple benefits for all the stakeholders involved:

- Migrants can access credit through formal channels at relatively cheaper rates and beneficiaries in the origin country can utilise the credit for diversifying the source of income and build resilient livelihoods.
- This leads to financial inclusion of migrants and the beneficiaries in the origin countries. It allows the returnee migrants to reintegrate in the society with financial stability and security.
- Money transfer operators can establish long-term association (for at least two years) with the customer and minimise the costs associated with retaining/acquiring customers.
- Banks in the origin country build trust for commercial banking. They have assurance of remittances thus improving the quality of assets for the bank. They can offer additional financial products and services to the new customer base.
- The countries of origin benefit from more social and economic development which would lead them towards self-reliance.

- The increased flow of remittances through formal channels would positively impact the origin country's debt sustainability and provide better access to international capital markets[10].
- Governments should invest in financial literacy to encourage the use of innovative solutions for financial services. (OECD, 2017)
- Innovative financial services would incentivise migrants to opt for formal channels over informal channels and regulators are assured that there are no risks associated with money laundering (Viswanathan, 2019).
- The host countries benefit from economic development through efforts and work of migrant workers in their economies. The creation of digital documentation and formalisation of workers would enable a conducive environment for migration and assist in realising the benefits of migration and remittances for both host and origin countries.
- Technological solutions using blockchain technology could pave a way forward and the effectiveness and scalability of such projects will be demonstrated over time. Governments could further explore innovative solutions for financial services through sandboxes and innovation hubs. They could also collaborate more closely with technology companies, money transfer operators and financial institutions.

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