Blockchain in Developing Countries

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A large portion of the population in the developing world can benefit from blockchain technologies. According to the ICT Facts and Figures 2017 report, 42.9 percent of households in developing countries have Internet access.[1] This percentage is rising quickly due to the increasing affordability and usability of smartphones. It can be argued that in many ways, blockchain has a much higher value proposition for the developing world than for the developed world. Why? Because blockchain has the potential to make up for a lack of effective formal institutions—rules, laws, regulations, and their enforcement. In this article, we will discuss key concerns regarding institutions in the developing world and evaluate the potential use of blockchain to address them.

PROPERTY RIGHTS

According to a 2011 UN report, weak governance led to corruption in land occupancy and administration in more than 61 countries. Corruption varied from small-scale bribes to the abuse of government power at the national, state, and local levels.[2]

Enforcement of property rights incentivizes investment and provides resources to avoid poverty. Agreed-upon property rights allow entrepreneurs to use the assets as collateral and thus increase their access to capital. However, a large proportion of the poor lack property rights.

Around 90 percent of land is undocumented or unregistered in rural Africa. Likewise, a lack of land ownership remains among the barriers to entrepreneurship and economic development in India.[3] One estimate suggests that more than 20 million rural families in India do not own land and millions more lack legal ownership of the land where they have built houses and worked.[4] Landlessness is arguably a more powerful predictor of poverty in India than caste or illiteracy.[4] In addition, according to the United States Agency for International Development (USAID), only 14 percent of Hondurans legally own their properties. Among those properties that are occupied legally, only 30 percent are registered.[5]

It is not uncommon for government officials to alter titles of registered properties, and there are cases where government officials have allocated properties with altered titles to themselves. Bureaucrats have reportedly altered titles and registered beachfront properties for themselves,[6] and have allegedly accepted bribes in exchange for property titles. Citizens often lack access to records, and those records that are accessible might provide conflicting information. Property owners are often unable to defend themselves against infringement of property usage and mineral rights.[7]

Blockchain can reduce friction and conflict, as well as the costs associated with property registration. It is possible to do all or most of the processing using smartphones.[8] Given this, it is encouraging that various initiatives have been undertaken. The US-based platform for real-estate registration, Bitland, announced the introduction of a blockchain-based land registry system in Ghana, where 78 percent of land is unregistered.[9] There is a long backlog of land-dispute cases in Ghanaian courts.[10] Bitland records transactions securely, with GPS coordinates, written descriptions, and satellite photos. This and similar processes are expected to guarantee property rights and reduce corrupt practices. As of mid-2016, 24 communities in Ghana had expressed interest in the project.[9] Bitland is planning to expand to Nigeria in collaboration with the OPEC Fund for International Development.[11]

The bitcoin company BitFury and the Georgian government signed a deal to develop a system for registering land titles using blockchain.[12] Currently, to buy or sell land in Georgia, the buyer and the seller must use public registry. They will pay between $50 and $200, depending on the speed with which they want the transaction notarized. This pilot blockchain project will move the registry process to blockchain. The costs for the buyer and the seller is now expected to be in $.05-$.10 range.[13]

In 2017, India's Telangana and Andhra Pradesh states announced plans to use blockchain for land registry. Telangana started a land registry pilot project in the capital city of Hyderabad. It was reported in September 2017 that a complete rollout of the program in Hyderabad and nearby areas would take place within a year.[14] In October 2017, the Andhra Pradesh government collaborated with a Swedish start-up, ChromaWay, to create a blockchain-based land registry system for the planned city of Amaravati.[15]

CONTROLLING CORRUPTION

Blockchain creates a tamper-proof digital ledger of transactions and shares the ledger, thus offering transparency. Cryptography allows for access to add to the ledger securely. It is extremely difficult—if not impossible—to change or remove data recorded on a ledger. With this feature, blockchain makes it possible to reduce or eliminate integrity violations such as fraud and corruption while also reducing transaction costs.

As an example, the use of fake export invoices to disguise cross-border capital flows has been pervasive in China. During April to September of 2014, $10 billion worth of fake trade transactions were discovered.[16] Major fraud cases occurred at the Qingdao port, where companies had used fake receipts to secure multiple loans against a single cargo of metal.[17] The Qingdao incident involved 300,000 tons of alumina, 20,000 tons of copper, and 80,000 tons of aluminum ingots.[16] As a result, Chinese banks charge higher interest rates and are less likely to offer collateral-based financing.[17] Blockchain can thwart such scandals.

Blockchain also makes it possible to generate smart ("tagged") property and control it with smart contracts.[18] Examples of such properties include physical property (car, house, container of metal) as well as nonphysical property (shares in a company).[19] Blockchain-based smart properties only undergo actions based on the information published in a smart contract.[18] If property is being used as collateral, the smart contract might not allow the owner to extend the same property as a collateral or security to another bank. Thus, the process of verifying collateral prior to the loan being made is greatly simplified for custodians.[20] Here, a trusted trading system is created for smart properties, making credit more readily available and cheaper.[19]

DISADVANTAGED GROUPS

Blockchain might also help refugees and displaced persons. Current systems that offer aid to refugees and displaced persons suffer from inefficiency, fraud, and gross misallocations of resources. For instance, fees and costs account for up to 3.5 percent of an aid transaction. Moreover, an estimated 30 percent of development funds fail to reach the intended recipients due to third-party theft, mismanagement, and other problems.[21]

Various blockchain-based solutions to such problems now exist. For example, blockchain can empower donors by ensuring that their donations reach the intended recipients. For instance, donors can buy electricity for South African schools using bitcoin. A blockchain-enabled smart meter makes it possible to send money directly to the meter, and there are no organizations involved to redistribute funds. Donors can also track the electricity being consumed by schools and calculate the amount of power their donations provide.[22] This program was launched by South African bitcoin startup Bankymoon via a crowdfunding platform.[23]

The UN's World Food Program (WFP) has used blockchain to help refugees. Money is paid directly to the merchants instead of the recipients. No banks are involved—beneficiaries receive goods directly from the merchants.[24] In early 2017, WFP launched the first stage of what it calls Building Blocks, giving food and cash assistance to needy families in Pakistan's Sindh province. An Internet-connected smartphone authenticates and records payments from the UN agency to food vendors, ensuring the recipients got the expected help, the merchants got paid, and the agency could keep a watchful eye on the money.

Starting in May 2017, WFP started distributing food vouchers in Jordan's refugee camps by delivering cryptographically unique coupons to participating camp supermarkets. Supermarket cashiers were equipped with iris scanners to identify the beneficiaries and settle payments (UN databases verify biometric data about refugees). Building Blocks' ledger records the transactions on a private version of ethereum (a cryptocurrency). WFP reported that by October 2017, it had distributed $1.4 million in food vouchers to 10,500 Syrian refugees in Jordan.[25] WFP expects blockchain to reduce its overhead costs from 3.5 percent to less than 1 percent and to hasten aid to remote or disaster-struck areas (where ATMs might not exist or banks are not functioning normally). Blockchain currency can even replace scarce local cash, allowing aid organizations, residents, and merchants to exchange money quickly and electronically.

SUMMARY

Blockchain will positively affect developing countries: it can help reduce fraud and corruption and increase legal property titles, which provides entrepreneurial initiatives to the world's poorest. It can also help financial transactions take place more quickly and ensure that aid is distributed with a smaller chance of theft and fraud.

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