Community Currencies

Trade facilitation and community development in the age of blockchain & DLT

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About the authors

Lead Author

Maike Gericke is the co-founder of Scrypt, an innovation studio that focuses on emerging technologies for social and environmental impact, where she directly supported financial inclusion projects and did research on the topic. Her work focuses on strategy & innovation, user-centric design and impactful communications at the interception of technology and impact. She is a member of the Board of Directors at INATBA, the International Association for Trusted Blockchain Applications initiated by the European Commission, and a core contributor at PositiveBlockchain.

Contributors

Dr. Ronald M. Steyer is an Economist and holds a Ph.D. in economics. He consulted German multinationals as well as senior management on Federal ministry level, and held management functions in strategy and change management in IT services and development finance. He has extensive project management experience and is a core Contributor at PositiveBlockchain.

Katrie Lowe is a Civil Engineer with close to 10 years of experience in project management and consultancy, focused on urban infrastructure. At PositiveBlockchain, she leads the Transport & Infrastructure and Food & Agriculture categories and is a member of the content team and Berlin meetups team.

Maciej Bulanda is a social scientist, researcher and project manager. He worked as a fundraising and partnerships manager across non-profit, tech, and humanitarian projects. His expertise ranges from social impact and human rights, to innovation in agritech and food security. At PositiveBlockchain, he leads the Living Conditions and Food & Agriculture categories and is the initiator of Blockchain for Social Good Berlin meetups.

Intro

The starting point of this report was a research study on behalf of the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH who is a global service provider in the field of international cooperation for sustainable development. The task was to investigate community currency projects in low-resource environments. However, in the course and following our research project, we have come across many additional projects, solutions, and learnings, which we found worthy of sharing. In this document we try to present a wider picture of the community currency landscape, including projects that have attempted or implemented blockchain technology in their solutions.

The authors would like to thank Franz von Weizsaecker and Dr. Uta Meier-Hahn of the GIZ Lab for the opportunity to conduct this study, and to their colleagues for valuable insights and discussions. Last but not least, we would like to thank all project owners and other interviewees for sharing their time and know-how with us.

We would also like to thank and credit the broader PositiveBlockchain.io community for their tireless efforts in supporting this study, and in updating the information that forms a basis for our insights.

The study is structured in the following way: In Part 1, we will first give an overview over community currency definitions and history and move on to discuss the role of blockchain and DLT in this context. Throughout Part 2, we will highlight project insights based on both data assessment and qualitative interviews.

We hope that this report will contribute to a better understanding of blockchain solutions in the field of community currencies and financial inclusion, particularly in low-resource environments.

Part 1

Community Currencies & Blockchain

The concept of community currencies

What is money?

Textbooks define money by its function. Typically three functions are mentioned:

- Money is a means of payment. Money is thus an object or an acquirable right that a buyer hands over to a seller in order to buy goods or services.
- Money is a store of value. It makes it easier to decouple buying and selling time-wise.
- Money is a measure of value and a unit of account. If it is accepted as a metric, it makes goods and services comparable.

Money simplifies the exchange of goods (i.e. trade). It facilitates the division of labour considerably and makes it possible to take up and repay debts.
Economic activity, trade and the division of labour, as we know it today, are hardly conceivable without money.

What is currency?

According to the Oxford dictionary, currency refers to (1) the system of money that a country uses and (2) the fact that something is used or accepted by a lot of people.
Currency, especially national currency, is therefore a representation of money in a country or region, but it can also take on other forms of representation of value in a system accepted by a lot of people - for example, communities. National currencies fulfill all three functions of the money definition above. As we will see later, currency does not necessarily include all functions of money to be defined as currency. However in most cases, currencies do at least include the functions of means of payment and measure of value.

What are communities?

Community refers to a social unit whose members are closely connected by a strong sense of "we". Communities are often more or less explicitly associated with a place or region. They can be a local or regional group (for example a neighborhood), but proximity does not necessarily constitute a community. Therefore, not every group of people in one place is already a community. Social platforms create new ways of creating and developing communities in virtual spaces.

So it is not spatial vicinity that creates communities, but a sense of belonging. Such a "sense of community" arises when four elements are found and shared by the members of the community (see McMillan & Chavis (1986) in sources section):

- Membership, which is sensed by the members as being of importance to each other and to the group, as well as a common trust, expressed through commitment to the community.
- The influence of the members that is imparted by the feeling that they have some leverage in the group. But there is also a certain influence of the group on its members, which is also necessary for group cohesion.
- Integration and fulfillment of needs, as members feel rewarded in some way for their participation in the community.

- Last but not least a shared emotional connection, like a shared history (or at least identification with the history).

Communities are social units with commonalities that are held together by personal social ties and a shared sense of community, either in a given geographical area or in virtual space.

A short definition of community currencies

Community currencies are complementary to the "incumbent" national currencies, they are not meant to replace them. They supplement them to achieve certain objectives for the community.

To be considered as a community currency, we apply the approach to currency presented above: The projects currency should represent value so that it can be used as a means of payment. The currency should also be a measure of the value the community is attributing to certain contributions, services or goods. A community currency can become a unit of account with value scales broadly shared within the community.

A common currency is - or should - not be, of course, an end in itself. It serves purposes, should be designed to meet the needs of the community and can strengthen the sense of community: The currency circulates within the members of the community. The currencies governance can underpin the perception of influence on the way the community is developing. It can help to create opportunities to integrate members into an exchange process. Members can experience a fulfillment of their needs, whether they are material or social. And eventually the currency can provide an element of a community history and identity that again can strengthen the community.
Community currencies are forms of money that complement the national currency used within communities to serve a shared purpose. Ideally, community currencies play a catalytic role in a

transformation process to improve livelihood of the community respectively its members.

The goals of implementing community currencies

Economic development / trade facilitation

In all the projects we came across, local economic development and the facilitation of trade amongst the members of communities is one of the objectives of introducing a community currency. The expectation is that the community currency will help to link unmet needs and unused resources within the community and to trigger a dynamic which sustainably improves the living conditions of the people.
Unmet needs in disadvantaged communities very often means that there is no access to basic goods, health and education. But these communities have resources at their disposal that are not used at all or not used efficiently. Unused resources refer to unsold excess of goods and services people are able to provide if liquidity (means of payment) was sufficient.

Community currencies can improve the efficiency of exchange especially in cases where it was done only in kind, because the community members do not have sufficient national currency available.

Community currencies can also create a sort of excess supply of currency using the seigniorage of that currency. Seigniorage is the value created from the difference between the production costs and the value of money. As especially digital community currencies cost little to create, first spenders can retain most of this value. Demands of community members are now backed by purchasing power.

This stimulates trade within the community, promotes cooperation and economic interaction by creating local trade networks. The more connected community members are to each other, the more valuable their network becomes. This effect is enhanced because the community currencies can only be used within the community. Since this obviously also creates a look-in, some community currencies came up with exchange rate mechanisms to gain other community currencies or national currency in exchange for the community currency.

Examples:

- A local currency is implemented that can be spent with local vendors. Community members get devices with an initial balance and use this balance for trade within the community. An improved resilience could be observed, and community currency seems to make progress in health and education indicators possible (Grassroots Economics).
- Some community currency projects focus specifically on the opportunities created by seigniorage. They tend to create a steady stream of some basic community currency income for the members of the community, oriented to Universal Basic Income (UBI) concepts. These concepts want to reverse the effect of money from a mechanism that excludes humans to an instrument of inclusion into a community exchange and trade network. The ideas is to create a more inclusive way of money distribution, allowing all members of the community to participate in the exchange of goods and services (e.g. Circles UBI).

Financial Inclusion & Last Mile access

A large portion of our world's population does not have access to Financial Services today. According to the Global Findex database, 1.7 billion adults did not have access to a bank account in 2017. This often includes rural communities in developing countries - the so-called Last Mile. While around 50% of unbanked people include women of poor households in rural areas or out of the workforce, financial exclusion is not limited to developing countries alone - it can occur in developed countries as well.

A big factor in the lack of financial access is the lack of necessary personal identification to open a bank account or authorize transactions, as well as the lack of a financial record that is required for access to loans.
For rural communities in developing countries, another important factor is physical access - banks

might simply be too far away or not available at all in the area. In this situation, people often need to fall back on expensive cash loans with high interest or focus on trade of goods altogether.

Community Currencies can help to facilitate trade in communities that are fully or partially excluded from financial markets for any of the above reasons. As we will see later, they can also be used as a vehicle to obtain a financial record.

Examples:

- A lending circle in which transactions within a community are recorded centrally. The community can use this transaction data to gain access to external loans (HiveOnline).
- A voucher or currency system is implemented in a rural community. The community has limited access to infrastructure and did not have any bank within reach, so none of the community members has any financial record.

Community development / incentives for social cohesion

Community development can be increased by incentivizing and rewarding specific activities within a community. This can be used to build infrastructure, pay for services that otherwise go unpaid, or simply reward community activities to create a closer bond and more social connections between community members.

In the context of social cohesion, it is important to consider the consequences of financial incentives on social behavior. In a famous example, Uri Gneezy and Aldo Rustichini conducted a study on the behavior of parents after introducing a fine for the late pickup of children from childcare. They found that with the introduction of the fine, late pickups not only persisted, but increased. Removing the fine did not alter the behavioral change. As Bernard Litaer points out in his extensive research on community currencies, it is important to consider this impact of linking economic value to social behavior, and keeping the two separate if needed.

Examples:

- A local community implements a currency that can be earned through fulfilling community duties like cleaning the neighborhood or taking care of elderly neighbors by doing the shopping for them or guiding them on a walk through the neighborhood. The currency can then be spent on help received by other community members. Some local stores also offer specific discounts.
- Community members can gain community currency through participating in community activities. The currency can be spent to reduce the total amount of a purchase in regular currency, or to get access to local services outside of peak hours.

Funding and aid distribution

Community currencies can be implemented in order to fund a specific community. The currency is used in this case to bring funds exclusively to community members.
NGOs that implement local economic development or social programs face a "Last Mile" challenge. Community coins can facilitate the payment of small amounts to members of a community over longer periods of time.
Examples:

- Community members receive an e-voucher with a specific balance. They can use that voucher to buy food and other items of daily need at specific vendors accepting the vouchers. Each vendor has a smartphone that accepts the e-voucher via a contactless payment and can also check the balance for users (UnblockedCash project by Sempo). This solution is also applied to e.g. refugees arriving in a host country without identification (Sempo).
- A currency that is implemented in a rural community in order to distribute aid. Devices are handed out that include an account with a certain balance that can be spent with local vendors or other community members (Grassroots Economics).

Community currencies – a historic perspective

Community currencies have a longstanding history, with countless examples of varying currency design, regional spread and short or long-term success to investigate. Over the last century, a lot of initiatives started with the objective

to bring work into areas of high unemployment. Those projects provide meaningful learning opportunities when looking to implement new technology-based solutions. Some examples:

Community coins in Germany in the 192X/193X, “Freigeldexperimente” / Wära: Implemented by Michael Unterguggenberger, mayor of the city of Wörgl in the midst of the Great Depression based on the theory of Silvio Gesell, introducing a small monthly user fee and thereby the concept of demurrage in currency.

Brixton pound: A local complementary currency introduced to support Brixton businesses and encourage local trade and production launched in 2009.

Bristol pound: A local complementary currency introduced to support local businesses and trade launched in 2012.

Chiemgauer: The regional currency of the Chiemgau region, introduced in 2003, inspired by the theories of Silvio Gesell and Rudolf Steiner.

LETS currencies (Local Exchange Trading System, UK based): The LETS model was developed in the UK by LETSLINK UK and began work in 1991, forming the basis of many local complementary currency initiatives.

“Tauschring” initiatives in Germany and Grains de Sel initiatives in France are other examples of local complementary currency systems.

Time Dollars was founded in 1995 by Dr. Edgar S. Cahn and is an initially US-focused concept based on service hours that can be implemented in communities of varying size.

Fureai Kippu (“Caring Relationship Ticket” in Japan as a part of the healthcare system, a concept based on care hours, but with different valuations per service provided. The concept is accepted with various NGOs. People can either save their care hours, complementing their national healthcare insurance, or transfer their hours to others, for example a family member in need.)

In summary, community currencies are not necessarily new. They have however gained increased attention and refocus in the digital age and time of blockchain technologies. So the question is: what can blockchain and DLT add that was not there before, and how can those technologies bring improvements to community currency design and implementation?

The role of blockchain

Traceability of transactions = financial record

The traceability of transactions is often the key consideration for implementing blockchain or DLT solutions. In the context of Financial Inclusion, this transaction history is a key factor in opening up the access of communities to external financial services. Transaction histories can be either created on the level of individuals, or for a community group. This is an important factor in the context of Last Mile, where a financial record often is a precondition for access to further financial services like loans.
Of course, an important question in the solution design is how this transaction history is recorded and stored, and who will be able to access the data. These concerns should be addressed in the data architecture and permission settings of the blockchain or DLT solution.

Access Management

In the context of community currencies and financial inclusion, Smart Contracts are mainly used as a means to facilitate transactions in a safe and trusted manner, while at the same time enabling access to entities that might not fulfill all regulatory criteria for financial transactions.

This is an important topic in the context of Last Mile, where end users are often not able to pass KYC criteria based on missing or nonexistent financial and/or identity records.

The Unblocked Cash project by Oxfam, Sempo and ConsenSys is a great example of access management enabled through smart contracts: DAI is locked in an escrow and is exchanged into a digital token that is only used for transaction purposes. Transactions are facilitated through e-vouchers using a NFC card that are given to users. The tokens can only be returned and exchanged into DAI if whitelisted within the smart contract.

This graduated KYC solution enables users to participate in a day-to-day transactions without identification records (e.g. refugees), at the same time safeguarding the system and keeping it legally compliant. As the e-vouchers are collateralized using a tradeable and stable digital currency, KYC-compliant users, such as partnered vendors, can directly access and exchange their DAI or continue to trade P2P.

Another example of blockchain-enabled access management is the World Food Program's Building Blocks initiative, which enables otherwise unbanked refugees to buy basic supplies. The system enables immediate transfers between WFP and refugees through the combination of biometric authentication technology with a private permissioned blockchain system. A planned next step of the program is to implement mobile money in camps, which would essentially be a community currency implementation.

Exchangeability

Community currencies as a complementary monetary system often enable transactions only among a dedicated group of community members and associated vendors. Outside this group, the currency does not hold value. While this is a necessary design aspect to enable trade facilitation and community development within that group, it also creates certain limitations.
If for example two local neighboring communities each have their own distinctive currencies, it might be a good idea to create means of exchange between the two communities. With the use of blockchain and DLT technology, concepts are emerging that enable these aspects of "controlled exchange".
The concept of Community Inclusion Currencies (CICs) of Grassroots Economics is a great example here: While individual community currencies are created through separate CIC Liquid Token Contracts, exchangeability between communities is enabled via an exchange protocol.
On the other hand, some projects like Hiveonline are facilitating the exchange of tokens into the mobile money (or *e-money*) system, which is widely used across Africa already. With adjacent solutions like Mojaloop the prospect of interoperability of mobile-money and thus, community currencies, is getting very realistic.

Exchange Values

As further outlined in section "Managing value & volatility" in Part 2 of this study, it is important to create solutions that bring perceived stability to a community based on their reference values.
While cryptocurrencies in general have a reputation of being extremely volatile, the use of blockchain and DLT can bring certain advantages in community currency design:

- Using stablecoins pegged to international currencies or national currencies
- Defining alternative grounds for token valuation: an hour of service, the price of coal, or kWh of energy, as we can see with The Sun Protocol.

In this context, blockchain and DLT enable secure, decentralized and disintermediated token issuance and storage, as well as the creation of specific tokens facilitating payment transactions within a system.

Improved usability

The use of blockchain or DLT can reduce the efforts of currency implementation and maintenance through the creation of customizable frameworks. We see various "protocol" type of projects emerging in this area, enabling the creation of individual community currencies. Value Instrument is an example for such an emerging system with customizable settings.

As a next step, we can think of "Community Currency as a Service" - Entire currency systems that can be customized, implemented and managed either through organizations, non-profits, or open-source communities.

In such solutions, blockchain and DLT has the potential to improve usability while reducing cost and overhead. However, as we will see in later chapters, there are still quite a few technical and regulatory hurdles to overcome until we realistically reach such scenarios.

Part 2

Project Analysis

Methodology

We selected a total of 41 projects out of the PositiveBlockchain.io database that fell into the broader category of community currencies and financial inclusion.
The further research focused on the 18 identified Community Currency projects out of the total set. Out of these projects and including further recommendations from our network, we selected a subset of projects for in-depth interviews, putting a core focus on projects with a high maturity. This method was complemented with additional desk research.

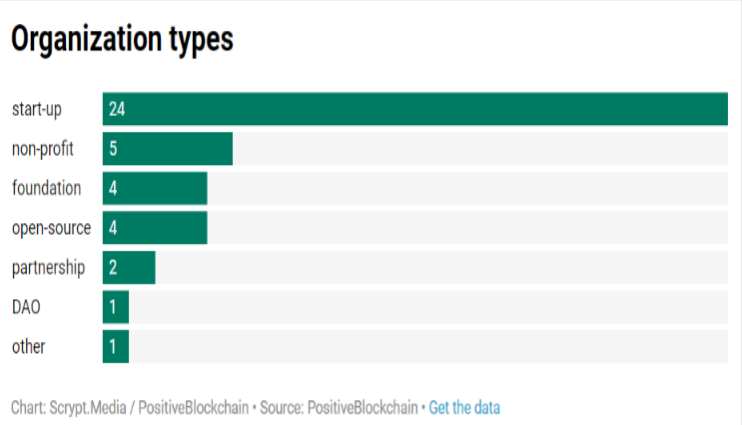
Exclusions

As our main focus was on community development and the use of currency within that, we looked at currencies and overall projects with a clear community aspect. Therefore, projects in the broader category of Financial Inclusion and other currency projects without clear community focus are not included in our selection, even though they may somewhat focus on community development as well.

Data Analysis

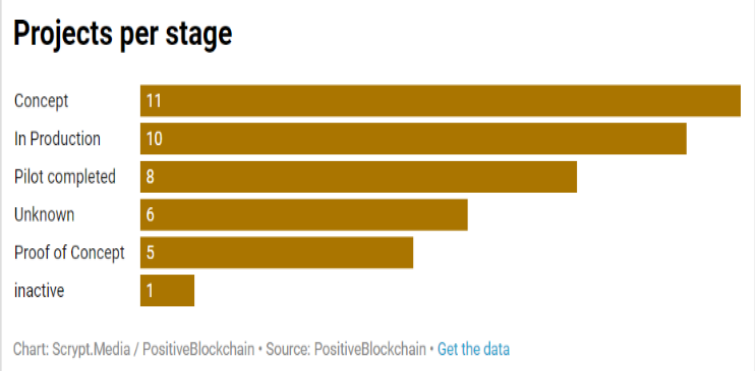
Organization type

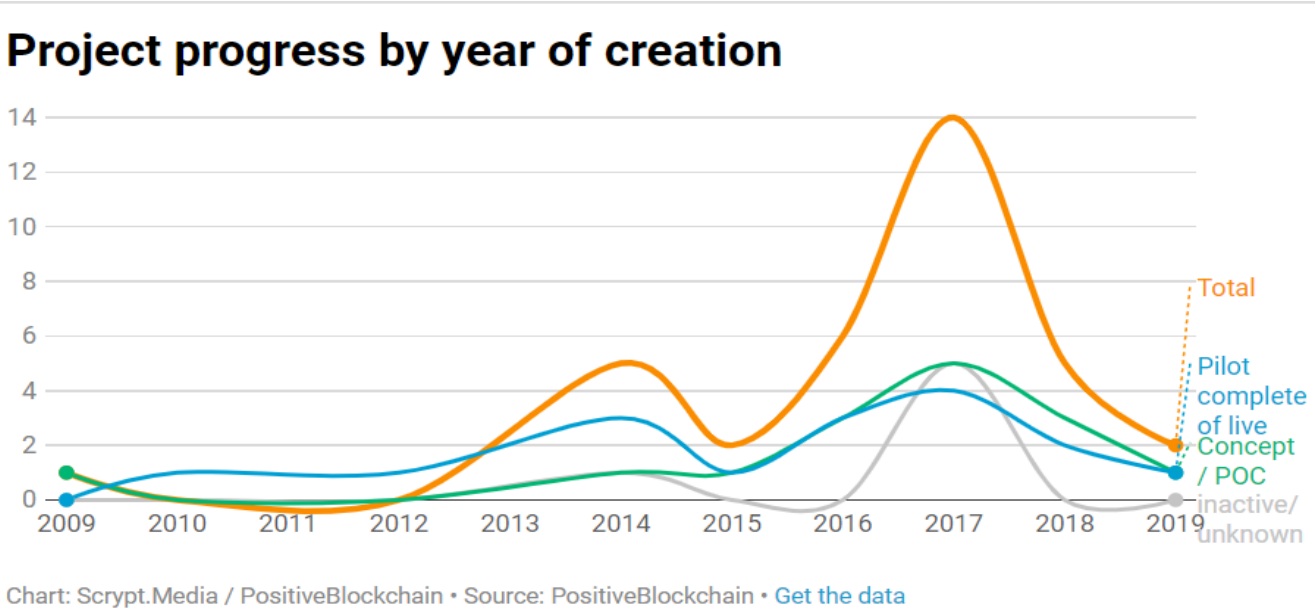
Out of the total set of 41 selected projects, 58% were reported as a start-up entity, 22% as a non-profit or foundation, and 12% as an open-source or DAO initiative.



Project Maturity

44% of project have completed a pilot or are currently in production. 39% of projects are at the concept stage (whitepaper) or currently work on a POC, while the status was unknown or inactive for 17%.





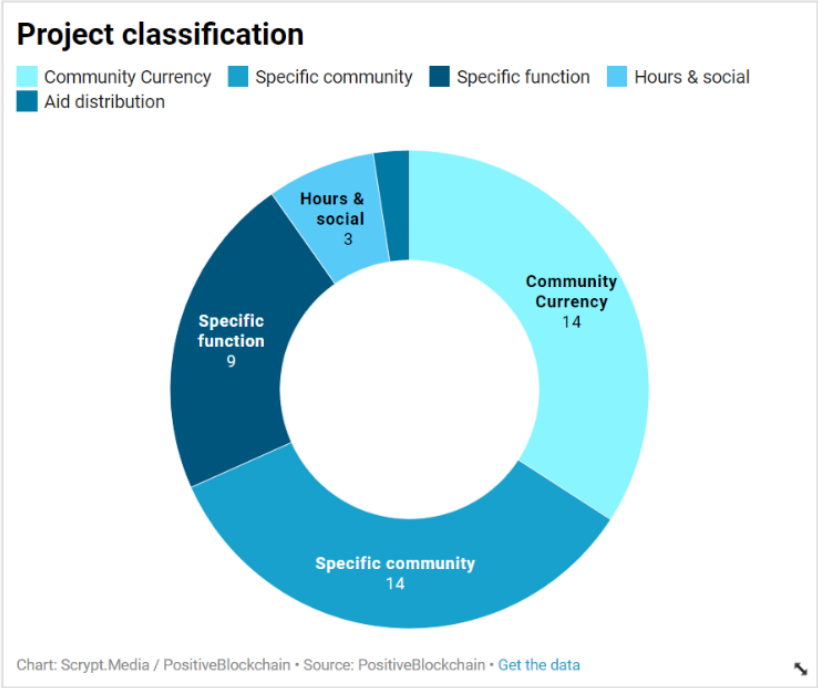
Plotting the progress of projects over their timeline of creation, we see that quite a few of the projects that completed a pilot or are in production have a history extending before the "blockchain hype" of 2017, indicating that they either qualify as early adopters, or have added blockchain or DLT to their concept at a later stage. Out of the projects founded in 2017, almost ⅓ are currently in production or completed a pilot, while ⅓ have an unknown/ inactive status.

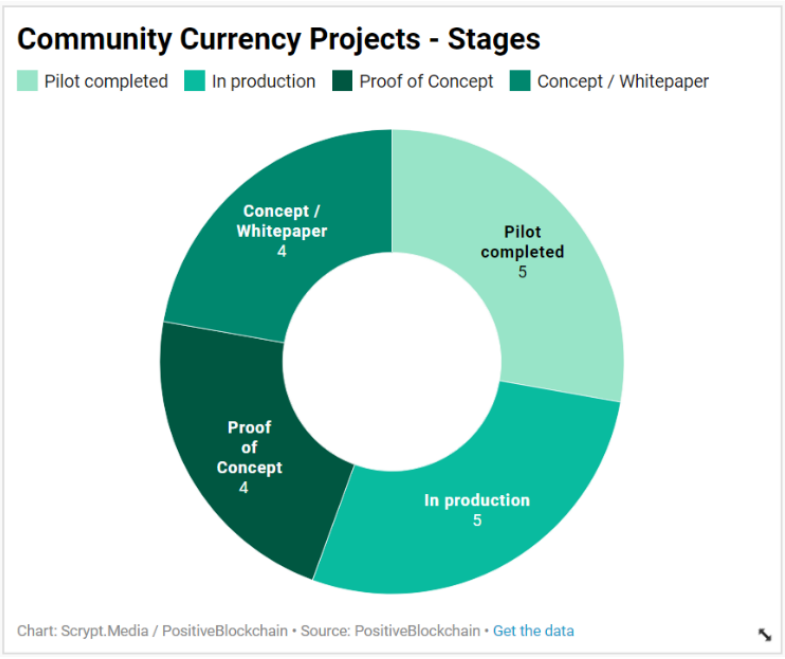
Project segmentation

Looking at the set of projects overall, we distinguished a few focus areas of the selected projects and classified them accordingly.

- *Community Currency*: projects that focus entirely on community currencies (our core selection)
- *Specific communities:* Projects that focus on one specific community, e.g. projects focusing on the LGBT community or on youth entrepreneurs
- *Specific function:* Projects focusing on specific functions or activities within communities, e.g. water access; incentivization of specific activities or sales of specific products.
- *Currency based on hours & social incentivization:* Projects focusing on community development through the exchange of hours of service, as well as social networks with other means of incentivization
- *Aid currency:* Currency-focused projects that are implemented with the aim of aid distribution in a community, but turn into a community currency if adopted.

For the detailed analysis, we excluded projects that fulfilling a specific function or targeting a specific community, leaving us with a set of 18 projects across Community Currency, hours & social incentivization, and aid currency segments.



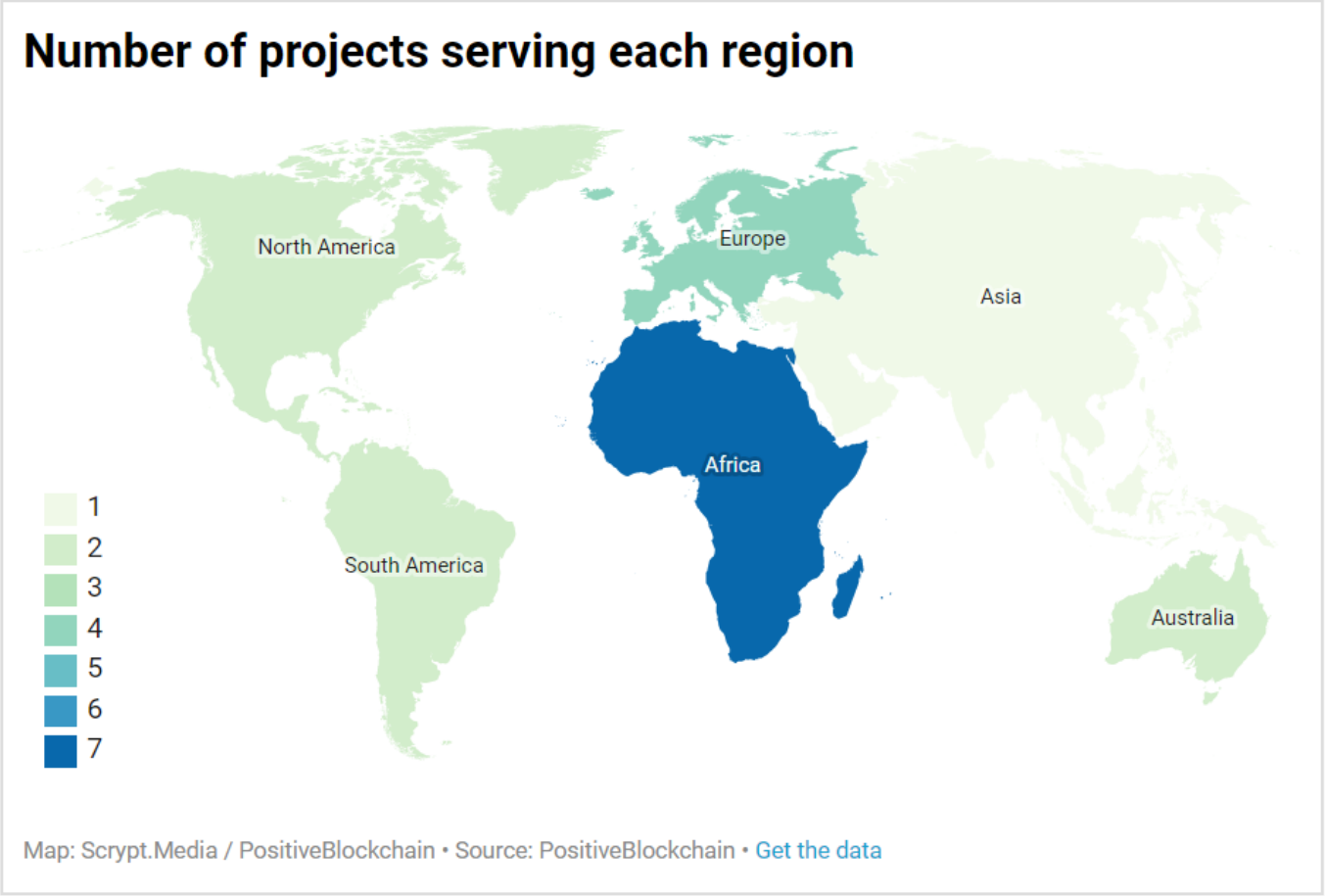


Maturity of Community Currency projects

The community currency projects selected overall show high levels of maturity - with 56% of projects reported as having a completed pilot or being currently in production.

Geographic reach

Out of the core set of community currency projects we looked at, we found a large number of projects with an initial focus on the African continent. This overview excludes 2 projects with a fully global decentralized focus.



The baseline: Community situations

The existing situation in a community plays a major role in the design of the specific solution.
Here are some points that were highlighted by project teams.

Existing networks and community behavior:

Solutions have a high probability to be adopted if they do not only take existing networks and behavior into account, but optimally build on these existing structures.

Financial literacy & reference frameworks:

The level of financial literacy in a community is very important for designing adequate solutions. Questions include how the community perceives money, how money or transaction value is usually counted and evaluated, and which references are used for transactions.

Local vendor & service landscape:

A good overview of the local landscape of vendors, service providers and key community members will help to draw a good overview of the necessary players that need to be integrated in a solution.

Infrastructure & network access:

How many community members have smartphones, and what types of phones do they use? What is the level of internet penetration? These are important questions to identify any infrastructure and network limitations to take into account in the design.

Legal framework:

The existing legal framework in the country of implementation is important to assess both in terms of opportunities and limitations. Many projects we interviewed were actively exchanging with local governments, secured support and provided insights related to blockchain and DLT solutions. In some cases, their interventions managed to change the legal framework after successful implementation.

Design and implementation - Best practices

Key success factors for adoption

The reported best practices and successful approaches leading to adoption are very much in line with existing theories on innovation adoption and diffusion.

Lowering adoption barriers
Solutions that do not overpower, but aim to enhance existing community mechanisms. Building on existing structures and known processes makes it easier for community members to embrace the new solution without completely changing existing behaviour.

Solutions that are built with the community, for the community: Ideally, a community is involved in defining relevant concerns that should be tackled through a new currency solution. Involving the community in decisions around the currency design, use and look will make it easier for community members to feel ownership and embrace the new solution.

Key community members as agents of change: Many solutions, especially in cases of Last Mile financial inclusion, work with key community members as ambassadors and bridges to the digital world. These community members also

function as early adopters and play an important role in the overall solution acceptance of a community.

Lowering digital barriers, building on known references: In most community currency solutions, underlying technology does not need to be understood by everyone. Very often, only key community members directly interact with technology, or the complicated technological solution is complemented with a user interface that is easy to understand and builds on existing references.

In summary, all these aspects are working directly towards lowering the barriers of acceptance and commitment towards the community currency solution.

Community Currency design

Facilitating community interaction

A key design objective of community currencies is to facilitate and enhance community interactions. This can be done via

- Enhancing existing community structures
- Networking facilitation through an app
- Increasing community transactions through demurrage

Enhancing existing community structures

As pointed out in the previous section, solutions that are focusing on existing networks and community behavior have a higher chance of adoption. When it comes to solution design, including and enhancing existing processes in a digital solution is therefore a helpful approach. As an example, Hive Online is building on lending structures within the community and enables the traceability of those transactions to build a credit history for the individuals and the community.

Networking facilitation through an app

Some projects pointed out that often a key advantage of using digital applications is merely to facilitate local connections, and enhance network structures within the community. Features of a digital solution that help to establish and deepen the connection with other community members are very beneficial in this context. Examples of such features could be ways to explore common interests with other community members, or the matching of supply and demand based on proximity and fit through a digital solution.

Increasing community transactions through demurrage

Demurrage, a term that many know best out of the shipping and trade finance context, is a known concept in the theory of community currencies long before blockchain and DLT. Here, demurrage can be implemented in the form of a charge for long storage of currency as opposed to spending it immediately. Currency held by a person can also simply lose its value over time or expire if no transaction occurs. This incentivizes transactions over storage and saving, and thereby helps to increase community trade.

In the context of blockchain and DLT, few community currency projects have included demurrage into their concept or implementation. The concept of Value Instrument includes the functionality of token decay and the ability to restore value dependent on account activity.

In a Last Mile context, both Grassroots Economics and Sempo are considering demurrage in their solution. In the case of Sempo, this is done through e-voucher expiry dates, while Grassroots Economics facilitates holding fees.

Local vs. decentral currency design

In the overall approach to currency design, issuance and implementation, we can distinguish between localized / community-oriented and decentralized efforts.

The difference here is that in the first case, a project team is taking care of the currency implementation for a local community, largely mimicking the national currency approach of a central bank in terms of currency distribution. This approach is prevalent in projects focusing on Last Mile financial inclusion.

In a decentralized model, all aspects of currency design, implementation and governance are taken care of by community members themselves. This approach requires a certain level of financial and digital literacy within the community and is therefore prevalent in projects with a focus on community development and social cohesion.

Managing value & volatility

Effectively managing currency value and volatility can be a challenge for community currency projects. One of the most important things to keep in mind is that both value and volatility are extremely perceptive - they depend on the reference values we use for comparison.

The definition of value and volatility strongly depend on two aspects:

- The goal of the project
- What value & volatility mean in the eyes of the target community

Some examples:

- Last Mile inclusion projects often base the value of community currencies on existing national currency. Why? Because it is easier for community members with limited financial literacy to understand the value in context of a known measure.
- In countries with extremely volatile national currencies, basing the value of a community currency used for trade on an international currency might help to keep liquidity in times of need.
- Community currencies that focus on community service and community development often create an entirely separate concept (e.g. service hours as a unit of account) that will not be immediately associated with financial value by community members.

The use of Stablecoins

The use of stablecoins played a significant role in terms of regulatory approval in project implementations. The creative token structure of some solutions (HiveOnline's *eArziki* and Sempo's *UnblockedCash*) became a key contributing factor to authorities' more positive evaluation of cryptocurrencies use for development aid.

As stability is important for exchangeability and thereby crucial for users with no financial liquidity, interoperability between community currencies and mobile money solutions (see HiveOnline & Mojaloop) indirectly offers a last-mile solution.

Even if common stablecoins (like DAI) are used in a system, they are often complemented by a separate currency or exchange system for the community itself (see e-voucher system of Sempo/ UnblockedCash, or Liquid Community Currency system implemented by Grassroots Economics).

Limiting transaction possibilities with the outside world

Limiting transaction possibilities with the outside world has two main objectives:

1. To increase the amount of transactions within community boundaries
2. To create a psychological distinction between a community exchange and a monetary transaction

As described in the sections "Economic development / trade facilitation" (p.4) and "Community development / incentives for social cohesion" (p.5) in Part 1, increase in intra-community trade and social cohesion within the community are key objectives of community currency implementations. Free trade of community currency outside community borders and community members

starting to adequate social transactions with financial value are key risks of reaching these objectives.

Therefore, it proves helpful to keep the core trade opportunities of community currencies limited within community borders. Where social cohesion and community development is a key implementation objective, it also proves helpful to create a clear distinction between community exchanges and monetary value, and to avoid the possibility of direct exchange between the two.

Community Currency implementation

Community involvement & Human-centered Design

In order to be accepted and used within a community, it is important to involve a community in the design and implementation of their currency from the start. This is best done through direct community interaction, and through the use of human-centered design approaches. Having solutions built bottom-up does not only increase the acceptance and use, but also creates more suitable solutions around the needs, skills and preferences of community members.

The optimal network size / critical mass

The network needs to have enough vendors to cover the needs of a community. The number of vendors and community members is less important than the match of supply and demand as the basis for an effective system with ongoing transactions.

The importance of local support during implementation

In order to create lasting solutions, local support and buy in is crucial, and cooperation proves preferable over a "greenfield" approach. As the setup of a new community currency often requires a highly complex implementation, it is important to work in an emergent, agile way.

A closer look at Last Mile approaches

Solutions for Last Mile financial inclusion usually have to deal with a few obstacles when it comes to the use of emerging technologies. Among other factors, project teams often need to deal with a lack of infrastructure, limited access to smartphones, and limited financial and digital literacy of the communities they are trying to serve. How are they dealing with this situation, and how are they using emerging technologies like blockchain and DLT in this situation?

The answer often lies in a very creative and sophisticated combination of online and offline solution aspects, tailored to the situation at hand. In our research, we came across blockchain solutions that have an integrated “offline mode” that records transactions but can go without connectivity over long periods of time (HiveOnline). The project team pointed out that access to smartphones is not a significant challenge as they become increasingly affordable, and KaiOS phones are widely seen as the future. Other solutions are working entirely with USSD connections and flip phones for all transactions. We have seen intelligent e-voucher systems that are limiting the need to smartphone access to a distinct set of vendors, which also function as a sort of “branchless-banking” entity that can give information on voucher credit and status to users (UnblockedCash/ Sempo). In all cases, it proved beneficial to take into account aspects of emerging technology in the local market, as it allows for greater functionality and ability to scale.

Overall, those solutions are showing in very inspiring ways how emerging technologies can make an impact even in the most challenging conditions, as long as they are implemented with a clear focus on the local situation at hand.

Is success the ultimate challenge for a community coin project?

It sounds strange, but the biggest challenge for a community coin project might arise when the project starts successfully. Through growth and greater public awareness, it will attract the attention of fiscal and monetary policy, and regulators. Historical experience already shows the problem: the quite successful community coin "islands" in the south of Germany that emerged in the late twenties / early thirties of the last century - see above - were banned by the central bank after it began to gain traction. Regulatory “red tape” is a huge challenge to develop such projects in highly regulated jurisdictions. The challenge for even less strongly regulated legal frameworks is “catching-up regulation” and the associated uncertainty for the project. Such projects - especially if they aspire a certain footprint - are therefore always also “political” projects.

Project snapshots

Grassroots Economics

Grassroots Economics is a non-profit foundation that seeks to empower marginalized communities to take charge of their own livelihoods and economic future. The focus is on community development through economic empowerment and community currency programs. Beneficiaries of programs include small businesses and people living in informal settlements as well as rural areas.

A community currency is a regionally based means of exchange that does not replace but rather supplements the national currency system. Through increasing trade by matching unmet local needs with underutilized local resources, community currencies enable sustainable environmental and social development programs. Community Currencies are distinct from the wider field of financial innovations because they are set up with the asset and productive capacity backing of the communities that will ultimately use them.
Starting in 2010 by providing printed currencies to communities in order to increase community trade, the project has evolved to digital currencies,

moving to cryptocurrencies through a partnership and integration with the Bancor protocol.

Sempo / Unblocked Cash

Throughout May 2019, Oxfam Australia and Oxfam Vanuatu executed a month-long trial that saw MakerDAO's DAI stablecoin distributed as a means of exchange among citizens of Vanuatu. The Oxfam initiative, named UnBlocked Cash, was conducted in partnership with ConsenSys and Australian tech startup Sempo. The Australian government also supported the program, which reached a total of 1,080 individuals. Another objective of this pilot was to test the time, quality and cost of distributed ledger technologies (DLT) and e-voucher based cash transfer programs in response settings, in comparison to other modes of cash assistance. Among other factors, the outcomes registered a 96% reduction in enrollment time and cost savings to NGOs and end- users, positive user feedback related to the solution. In addition to the Unblocked Cash pilot, Sempo, an open-source payments platform for underserved communities, has implemented further successful initiatives in Kurdistan and Greece in partnership with Coinbase.

HiveOnline

Hiveonline is a Danish/Swedish award-winning startup "constructing a financial alternative for communities of small businesses, their clients, lenders and investors, with the aim of making a fairer and sustainable environment for all". In partnership with CARE International, Hiveonline implemented their solution in Niger known as *e-Arziki.* Further projects are underway across Africa (Mozambique, Kenya, Tanzania, Mali) for different contexts (communities) and partners. The project in Niger creates a digital history of transactions within the communities (Village Savings and Loans Associations, known as VSLAs), allowing community members to build a reputation history that can be shared with microfinance institutions to get better credit or other financial assistance. The community transactions can run on disconnected mode as well, which is crucial in the context of low internet penetration. The token architecture has been based on a stable coin and operates on a mobile-money license, which renders the solution scalable even in jurisdictions sceptical of crypto-currencies. Mobile-money integration allows for cashless transactions to happen between communities, which is crucial in a highly insecure environments (such as Niger), where the risks and costs of physically transferring the money is very high. Hiveonline solution is based on a Progressive Web App, so it can work on virtually any device, and its interface can be customised (UI/UX) taking into account users' literacy or weather conditions.

Colu Local Network

Colu is dedicated to making cities thrive, using everyday interactions to drive social and economic progress. Colu city coins operate in 5 cities (TelAviv, Haifa, Liverpool, London, and Belfast) and launched partnerships with municipalities of Tel Aviv-Yafo and Belfast. TLV Coins reward residents for strengthening local businesses through the

Colu app. In addition, money is being raised for local NGOs to further strengthen the local community. Neither scheme is currently based on blockchain technology. The Colu Group is also in talks with a number of other municipalities across the world, about introducing similar initiatives.

Celo

Celo is an open-source platform allowing for an ecosystem of powerful applications built on top, including easier cash transfer programs, peer-to-peer lending, collaborative small-scale insurance, and other digital assets and wallets. Celo builds on a proof-of-stake based blockchain with smart contracts. The technology uses a phone number-based identity system with address-based encryption and eigentrust-based reputation. Celo's stablecoins are stable value currencies, implemented by an algorithmic reserve-backed stabilization mechanism. The first stablecoin, cUSD, is pegged to the US Dollar. Similar to the Colu Local Network, Celo creates a platform for creating local coins, but in this case they are stable-coins. They can be pegged to any local fiat currency but also to a basket of goods, thus mitigating inflationary risks. Celo builds a user-friendly solution for crypto currencies ("mobile money") as it verifies the users with email or phone number, hoping to increase adoption rates. Crucially, the project has completed an in-depth user-research in Argentina, Colombia, Kenya, Tanzania, and recently in Mexico and has ongoing partnerships with WFP and GiveDirectly.

Circles UBI

Circles is a proposal for an electronic cryptocurrency with the aim to create, distribute and maintain Universal Basic Income. It is based on individualized currencies and a social graph of trust between these currencies. When new users join Circles, their personal cryptocurrency is created on a smart contract-enabled blockchain. This currency is then regularly minted and added to their account, forming the basis of Circles' UBI properties. The money becomes valuable only if the account owner connects to other accounts, and agrees to trust their personal currencies, treating them as identical to any other Circles currencies that they hold. These trust relationships form circles, fostering local networks and mutual economic cooperation. Through the use of blockchain technology, Circles aims to be both resilient and globally accessible.

Trustlines

The Trustlines Network ecosystem aims to promote financial & economic inclusion of all people through decentralized and open source systems. The Trustlines Protocol is being built to support a range of use cases by leveraging existing networks of mutual trust and mapping trust-based relationships onto trustless infrastructure. One such potential use case is People Powered Money. This idea, which is also the fundamental concept of the original Ripple idea was to build a digital network mirroring real world bilateral trust-relationships, i.e. out of an already existing social graph.
In this system, representations of value may reflect or be denominated in real-world fiat currencies, while existing as IOUs between trusted parties that have entered into bilateral credit-line agreements. Payments between non-trusting strangers are implemented by "rippling" balance updates through a network of trustlines. A path of trusted relationships has to connect both the paying and receiving party (e.g. a chain of friends-of-friends). In such a complementary currency setup, money is decentrally issued by users, based on credit given to trusted friends.

Coinsence

The Coinsence platform enables user to connect, make collective decisions, activate resources and create shared value. The user issued coins can be invested by the community members in projects and can be exchanged for different value contributions. They can be used as reputation points, as community currencies and can also represent voting rights or asset shares. The main goal of Coinsence is to address youth unemployment, support non-profit initiatives, empower social entrepreneurs and build an open and democratic ecosystem for collaborative, fair and sustainable economy. The current regional focus of the project is Tunisia where different pilots have been established. The project partners with local associations, innovation hubs, educational institutions and international organizations like e.g. UNICEF, GIZ and JCI for community building, initiation of projects and implementation. To reward community work and contributions,

Coinsence is engaging local businesses and peer-to-peer networks that accept tokens as alternative or complementary payment units for services, products and resources. After growing the community in Tunisia and engaging diaspora, the further ambition is to initiate further community building activities in other countries and build cross-national collaboration and value creation ecosystems which are empowered by impact currencies. Coinsence is one of three projects in the world selected to receive Ethereum funds from the newly established UNICEF Cryptocurrency Fund.

Value Instrument

Value Instrument provides a meta-tool for designing and deploying complementary cryptocurrencies, which can include a basic income for each of the community members.
The Value Instrument outlines four design principles for value accounting and establishes a system in which each setting is customizable according to the requirements of its user base.
The principles themselves are technology-agnostic, however, their application will be most effective if paired with distributed ledger technology and smart contracts using digital tokens. Depending on the design of each implementation an established token may also be used as a form of money, complementary to other currencies in use. The Value Instrument token design principles allow for highly flexible token creation for many individual use cases. They are open to be integrated into any Dapp, app, software or web-platform.

Duniter

Duniter, a cryptocurrency software, provides the ability to create currencies as defined in the Relative Theory of Money by Stéphane Laborde. The system for money creation consists of Duniter (independent blockchain) and Cesium (application for transaction & certification). Any member is co-producer of the money. The act of certification implies that individuals know each other and have met physically (web of trust). The first "Libre currency", Ğ1, was launched in March 2017 in France. The concept includes an app, (physical) markets (esp. south-west of France, Toulouse), an exchange platform and >2.000 members mostly in France with ongoing currency circulation.

Akoin

Akoin is a cryptocurrency/digital wallet with an integrated ecosystem of DApps (Decentralized Crypto Apps) that will provide immediate and ongoing new revenue generating opportunities and micro-exchanges to stimulate and support youth entrepreneurship, economic stability and growth in Africa.

Conclusion

In general, we see two main distinguishable use cases: Community currencies focusing on social cohesion and community development in local or decentralized communities, and community currencies focusing on Last Mile financial inclusion.

Especially for the first case, emerging "protocol" projects are building a promising foundation to facilitate the use of blockchain across various settings. Thereby, they are catering to the need to customize community currencies to the specific implementation context.

This brings us to the important point that there is no "one size fits all" blueprint for community currency design and implementation. Community coins are a social rather than a technical project. A token can be represented by a slip of paper, but the social and economic model behind it has to be sorted out thoroughly and is highly dependent on the respective social context. This makes it very challenging to duplicate any social and economic model from one social context to another without tailoring and adjustment of the solution.

In general, the application of blockchain to community currency projects needs to have a real added value rather than duplicating an existing system, and needs to sufficiently address Last Mile challenges for a successful implementation. In several cases, blockchain technology turned out to be a major challenge and was either abandoned or sunk the project.

Apart from the use of cryptocurrencies and smart contracts to build a sophisticated system of exchange independent from traditional currencies, the core benefits of blockchain lay in the creation of transaction history (and thereby credit score) for users, which needs to be adequately facilitated in the context of limited connectivity.

In relation to transaction insights and storage of personal data, the optimal balance between the privacy of personal information and open availability and transparency through permissionless systems is an overall topic across many current blockchain and DLT developments, and also needs to be found in this context.

When it comes to implementations, local and regional regulation and the uncertainty of the regulatory context going forward is still posing a major challenge to the successful implementation of Community Currency projects worldwide. However, our research found that the use of stablecoins played a significant role in terms of regulatory approval for the implementation of some projects. The use of stablecoins helps to incentivize community transactions, as opposed to storing value in the currency. Demurrage is another design element that helps to incentivize trade over storage.

Stability is an important aspect for exchangeability, which in turn is crucial for users with no financial liquidity. Therefore, the concept of interoperability between

community tokens and mobile-money is highly interesting and indirectly offering a Last Mile solution.

An important learning from many projects is that the solutions must be built bottom-up, with the participation of the users and taking into account their needs, skills, preferences, in order to provide fully accepted and truly suitable solutions. Hence, many of the successful or promising projects prioritized user-research (in particular Hiveonline, Sempo, Celo, Grassroots Economics).

For Last Mile solutions, a delicate balance lays in finding immediate solutions to address the needs of the most vulnerable populations, while ensuring that those populations will not be exploited further in the process. In a context where *any* solution can do something to improve the baseline on the short term, it is important to put a key development focus on the solutions that aim for long-term sustainability, and build the legal preconditions to ensure that these projects can succeed.

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Images

Page 3: UnBlocked Cash pilot in Vanuatu, Image Courtesy of Keith Parsons/Oxfam Aus

Page 14: Coinsence workshop in Tunisia. Image Courtesy of Karim Chabrak / Coinsense