Blockchain 4 Impact

Unlocking distributed ledger technology's potential for a sustainable future

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A joint conference of the United Nations' JIU and the Geneva Macro Labs

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Joint Inspection Unit
of the United Nations System

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Executive Summary

Distributed Ledger Technology (DLT), such as blockchains, has gained importance as an instrument to achieve sustainable development goals (SDG) through private-public partnerships. The private sector started to design responses to specific challenges like trust, security, privacy and transparency including a wide range of stakeholders. First examples regarding DLT's social impact are celebrated as success-stories, but many questions still need to be negotiated. Together with its partner, the United Nations Joint Inspection Unit (UN JIU), Geneva Macro Labs organised a multi-stakeholder conference in late September 2019 to discuss opportunities and challenges of DLT when used to achieve the SDGs. This Solutions Paper provides a summary of the debates and our conclusions.

A key challenge identified during our conference concerns the absence of international standards and regulations. As a consequence, existing initiatives such as the one launched by UNICEF to hold and make transactions in cryptocurrency might not be sustainable. Other questions that arose concerned privacy and responsibility. Does blockchain provide privacy or does it provide transparency? How can blockchain-based applications be created and designed in order to enhance privacy? And if payments are made via DLT who should be in charge of our global digital payment infrastructure? Should it be private actors, governments or some international organisations?

Questions like these clearly reflect Key Challenges of blockchain technology:

High level of redundancy

Slow and ineffective in many scenarios

Decentralization creates lack of accountability for the system

Self-enforced rules lack flexibility and easy adaptation to changing circumstances

Immutability creates lack of accountability for the system
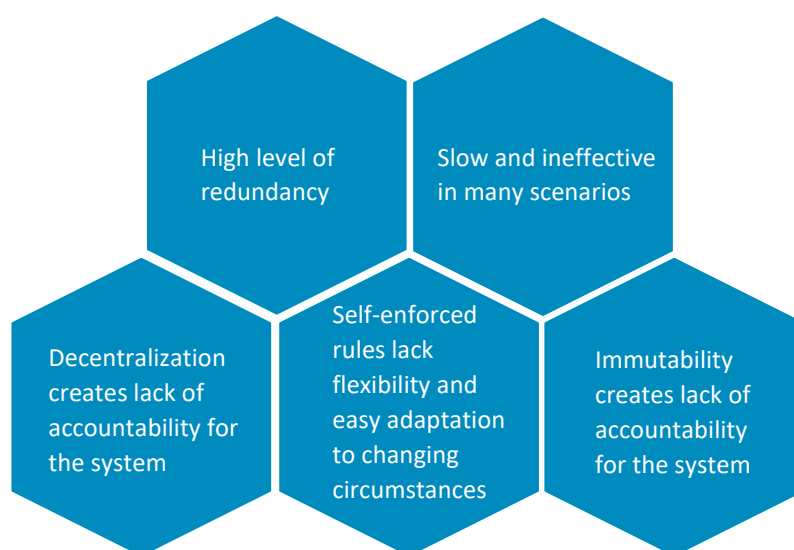
How to counter these challenges?
In this Solutions Paper, Geneva Macro Labs argue that the SDGs need a next-generation blockchain technology. Private blockchains are silos, which might be useful for individual players but do not support SDGs where cooperation is key. So how could an SDG-driven blockchain look like? It is a DLT which has a clear distributed ownership and totally transparent governance.

As global systems are confronted with (too) many different laws and regulations, next-generation blockchains would need legal certainty. This is not reflected in the current law yet. In this regard, clarity on regulations and laws would allow for stability in the system. Blockchain is only a technology,

and such a tool will not help to attain the SDGs if we miss forming a regulatory framework and a proper governance system.

We see six **Opportunities**, which *Blockchain 4 Impact* could provide:

1. Improved financial inclusion and cheaper transfer of funds

2. Identification for those who have none

3. Improved governance and traceability (data, money, aid, certificates)

4. Digital assets for currently unprotected goods and services

5. Truly decentralized social innovation

6. Proof of authenticity in an age of fake news, counterfeits and corruption

The Geneva Macro Labs suggests five **Solutions**:

1. Setting up a Global Blockchain Observatory. At the inter-governmental level, so far only the European Union and OECD countries have set up such observatories that publish regular reports and recommendations on how the industry should be regulated and evolve.

2. Fostering industry standards. This includes, the development of a new, uniform protocol in which *Blockchain-4-Impact* projects can be developed and deployed in order to foster fast, efficient and targeted approaches across a range of SDG targets.

3. Offering safe spaces and sandboxes for innovation. Safe spaces and innovation sandboxes are needed to provide a platform for design thinking and a shift towards a more positive narrative around blockchain-driven systems change.

4. Regulating service providers and custodians. The law needs to include provisions for trading tokens and digital assets. Frontrunner countries such as Liechtenstein can provide insights into how to set up an appropriate legal framework for tokens.

5. Promoting public-private partnerships (PPPs) for *Blockchain-4-Impact* solutions. To be effective and offer viable solutions in this area, private actors need to find reliable partners at the national or international level that work together with them in addressing specific SDGs. Examples for driving forces of such PPPs are INATBA (EU), Alastria Blockchain Ecosystem (Spain), or LATCHAIN (Latin-America).

1   Introduction

The Global Agenda 2030, a framework for sustainable development agreed upon by 193 states with 17 Sustainable Development Goals (SDGs) and 232 indicators covers a broad range of social and economic development issues including poverty, hunger, health, education, gender equality, clean water, sanitation, energy, environment, and social justice.

In the corporate world blockchain gained prominence by 2014, when entrepreneurs embarked to invest in its application beyond cryptocurrencies. Its principle to function as an open, decentralized ledger that records transactions between parties in a permanent way without depending on third-party authentication, promised to bring down costs of operation and administration or help to prevent fraud. By 2016, international development actors began to explore and deploy blockchain-based solutions.

Against this background, Geneva Macro Labs organised the "*Blockchain-4-Impact*" conference together with the United Nations Joint Inspection Unit (UN JIU) in order to offer a new space for information exchange, debate and critical reflection around the blockchain technology. In particular, participants discussed with our 25 speakers the extent to which blockchain can offer opportunities to address gaps in achieving Sustainable Development Goals, limitations of this technology as well as risks for privacy, inequality, and financial stability. A key goal of the conference was to link technical aspects of blockchain to policy objectives, discussing concrete use-cases and their potential. It offered a space for discussion and exchange around concrete examples in order to help developers, regulators and users better understand each other and the technology.

> *"The United Nations system is open to innovation and hopeful that new technologies including blockchain will bring a contribution to the achievement of its mandates, in particular the 2030 Sustainable Development Agenda"*
> (Petru Dumitriu)

The conference brought together different stakeholders, exploring the value added of blockchain technology for the global sector. Holding our conference at the Palais des Nations was a reflection of the rising interest for making development solutions sustainable. Indeed, to date, a series of United Nations Agencies have started to use this new technology and/or explore its potential, such as UNICEF [1], UNDP [2] or the UN Joint Inspection Unit.

2   How can blockchains help in achieving the SDGs

Latest data on countries' performance on the 17 SDGs demonstrate the difficulty of implementing deep transformation in the different areas of development. No country is close to meeting the goals. On the contrary, alarming trends and significant gaps open up in many areas [3]. In most OECD countries, for instance, economic growth still correlates with negative environmental impacts (SDG 14 and SDG 15) and trends on greenhouse gas emissions are not improving (SDG 13). Socio-economic spill-over effects of high-income countries undermine other countries' capacity to finance SDG-related programs [4]. Considering the need of introducing new momentum to global commitment to the SDG, this Solutions Paper discusses:

❖ Key challenges, threats and opportunities that come with blockchain innovations;

❖ Promising key features of blockchain applications, and

❖ Ways in which the blockchain technology can help to accelerate reaching the SDGs.

2.1   Which are the main strengths, opportunities and challenges of blockchain?

Blockchain is not a panacea. Costs and benefits need to be compared. Blockchain technology, which is part of a large group of distributed ledger technologies (DLT), offers decentralized solutions that can be used for activities requiring tamper-proof bookkeeping of assets or any type of information. The distributed nature of blockchain technology and the immutability of data stored on a blockchain are the biggest assets of blockchain technology but also its biggest stumbling blocks. Blockchain governance is needed, but has to be decentralized to preserve blockchain's biggest asset.

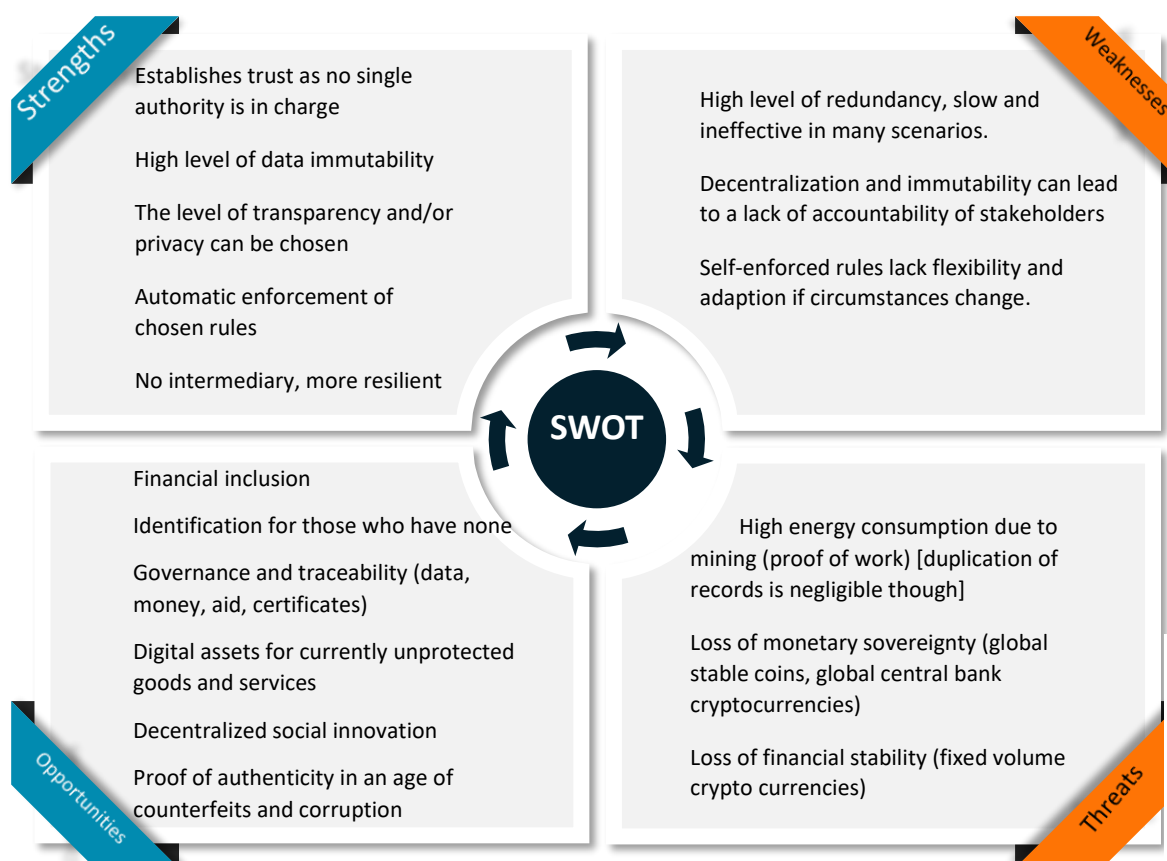At the same time, blockchain faces major challenges:

❖ The significant electricity consumption of some of the key features of DLT (proof-of-work protocol) and a lack of scalability rise concerns both regarding its ecological footprint and the efficiency with which transactions can be carried out.

❖ DLT can offer different levels of transparency or privacy which can be defined and potentially modified by its designers, creating uncertainty among users about the sustainability of one particular application.

Blockchain's biggest advantage is that it removes the need for strong and possibly corruptible central intermediaries, which allows for powerful decentralized applications. But DLT is only a tool. Regulation needs to prevent that its use can have a detrimental impact on society.

There are already initiatives to address these challenges. The EU-country Malta, for instance, is the world's first nation to provide a legal framework around blockchain and cryptocurrencies: the Malta Digital Innovation Authority Act, the Innovative Technological Arrangement and Services Act, and the Virtual Financial Asset Act. These three bills provide the crypto industry with regulations, including a set of compliance-requirements for crypto-based enterprises.

The discussions at our *Blockchain-4-Impact* conference distinguished between the following strengths, weaknesses, opportunities and threats (SWOT) of the blockchain technology:

Figure 1: SWOT Analysis of the Blockchain technology

Strengths

Establishes trust as no single authority is in charge

High level of data immutability

The level of transparency and/or privacy can be chosen

Automatic enforcement of chosen rules

No intermediary, more resilient

Weaknesses

High level of redundancy, slow and ineffective in many scenarios.

Decentralization and immutability can lead to a lack of accountability of stakeholders

Self-enforced rules lack flexibility and adaption if circumstances change.

Opportunities

Financial inclusion

Identification for those who have none

Governance and traceability (data, money, aid, certificates)

Digital assets for currently unprotected goods and services

Decentralized social innovation

Proof of authenticity in an age of counterfeits and corruption

Threats

High energy consumption due to mining (proof of work) [duplication of records is negligible though]

Loss of monetary sovereignty (global stable coins, global central bank cryptocurrencies)

Loss of financial stability (fixed volume crypto currencies)

2.2   Which are the key features of blockchain technology?

As DLT protects information through a high level of redundancy, the blockchain becomes slow and ineffective. Moreover, no single actor can modify the system, so no single actor can be held accountable. Which features of a blockchain contribute to these challenges?

We highlight five of them, as they represent fundamental principles for its operation as a digital platform for recording and verifying transactions.

1. An important concept about blockchain is its distributed network and the fact that no single central authority is in control.

2. The result is that there are no or at least fewer layers of third-party intermediaries between two parties: no bank, no notary, just the network.

3. Transactions and updates to the records are being recorded through consensus. Different consensus mechanisms exist depending on the particular set-up of the blockchain (Zheng et al. 2017). A key objective of these mechanisms is to solve the "double-spending" problem, i.e. to guarantee that a digital asset – such as the cryptocurrency Bitcoin – is effectively transferred from the sender to the recipient and cannot be spent twice.

4. Transparency is a key feature of DLT as a copy of the data is shared with every participant in the respective network. Depending on the characteristics of the blockchain, however, participation is restricted and requires prior approval. The privacy of data processed in the

context of blockchains is determined by its "use of privacy enhancing technology" like encryption, hashing and zero knowledge proof.

5. And finally, data is append-only, i.e. data can only be added to the blockchain, not overwritten. Recording new transactions or modifying existing ones systematically require a new data entry.

While this seems to be problematic regarding storage capacity the fact that this very capacity in computer systems exponentially grows provides hope. Future IT should hence be able to manage this linear growth of data. However, exponential growth of users has been a challenge to blockchains like Bitcoin or Ethereum. The massive duplication of data on all nodes reduces the efficiency of blockchain based systems. However this is not the cause of the massive energy consumption. The waste of energy is rather caused by the proof-of-work protocol, which is used by first and second generation blockchains. Ecological sustainable applications of blockchain should use other consensus mechanisms that exist in third generation blockchains.

"Is blockchain a truth machine? It's a myth. The technology can only verify data native to a chain. It cannot assess if external data from an Oracle is accurate."
(Alessandro Sanos)

Transparency versus privacy

Blockchain and privacy enhancing technology is a great combination to create different levels of privacy and transparency. Some data can be either entirely public, only publicly provable for those who have it or completely private. Technology can enforce the required privacy and transparency level. How much privacy is needed can be determined when designing the blockchain application. This is composed of on-chain and off-chain storage. Compared to conventional applications, even administrators and intermediaries have a hard time to circumvent this.

"Does blockchain provide privacy or does it provide transparency? This is a design choice when you create your blockchain-based application and use privacy-enhancing technology." (Jörn Erbguth)

The technical application then enforces the chosen privacy design. Even governments or private actors such as big companies are bound by it because the inherent rules are technically protected. That's the basic advantage of DLT and privacy enhancing technology in order to provide the level of privacy, the level of immutability and transparency we want. And of course, it is our decision to decide what level of privacy, immutability and transparency we want and for what purpose.

How can we generate trust in decentralized systems?

In contrast to a system with a central counter-party that matches the different transactions, in decentralized peer-to-peer networks participants cannot automatically be certain about the validity and immutability of the transfer of money. This so-called "double-spending problem" arises due to the fact that digital records can be copied indefinitely and without costs. For decentralised systems to work, a mechanism needs to be added that allows to verify the transactions and ensure that it is

unique and immutable. In other words, a mechanism to restore trust in the system needs to be implemented.

This is where blockchain added a major innovation. Different consensus mechanisms have been developed that help addressing this issue, the most well-known being the "proof-of-work" mechanism. Common to all these mechanisms is that an incentive is being provided for members of the network to validate truthfully each other's transactions even though they are not part of this particular transaction. The different consensus mechanisms rely on cryptographic techniques that are expected to make them unbreakable but often come at the cost of lack of speed, scalability or – in the case of the proof-of-work mechanism – large energy costs. This heavy ecological footprint is also, which remains the Achilles' heel of the current blockchain technology.

Interoperability and stability

The thriving environment in which new blockchain applications are being developed is both one of its major advantages and a key challenge. In the absence of a common industry standard, issues with interoperability arise that prevent a more large-scale application. Bitcoin and Ethereum are slowly emerging as the two key players in this environment but tailor-made applications, often around private blockchains are dominating the Blockchain-4-Impact world. Not only does this hamper a more dynamic development and upscaling of existing solutions, it also prevents an easy transfer of ideas from one application to another.

In addition, applications around e-payment systems and those addressing financial inclusion have attracted increasing attention by policy makers and central banks. The fear is that a large proliferation of decentralised currency systems can undermine the stability of existing financial institutions and hamper the effectiveness with which central banks aim at controlling interest rates and inflation. A particular concern is also that cryptocurrencies might offer new ways for money laundering and illicit financial flows:

"There are three challenges for cryptocurrencies: Prudential supervision, identification of those who make payments and those who receive payments and the standardization of these processes." (Thomas Moser)

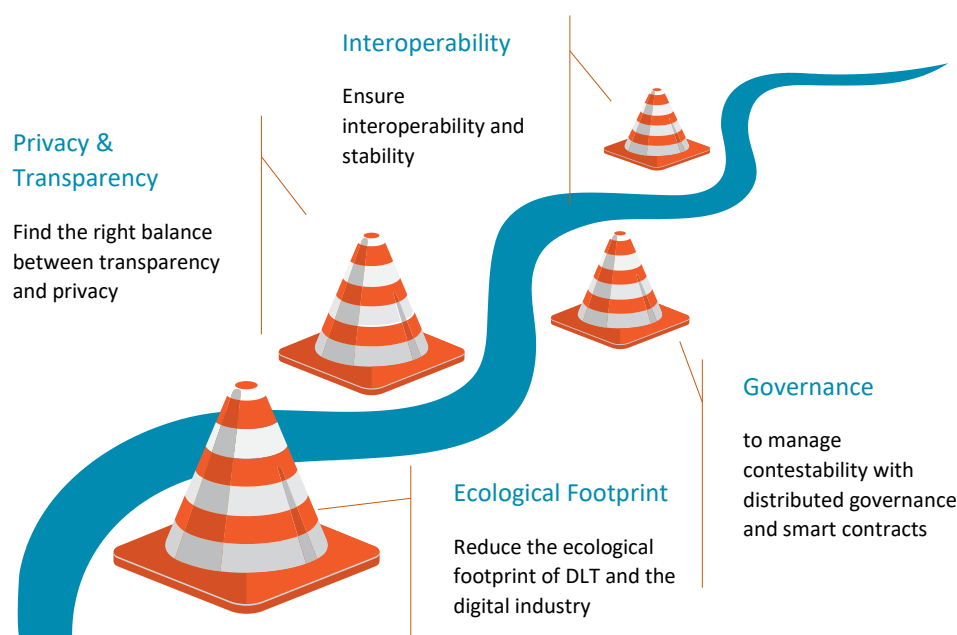## Smart contracts, distributed governance and contestability

A final challenge concerns the distributed governance of the blockchain environment. All participants in the network are both carrying out transactions and ensuring that the consensus mechanism is properly being applied. In practice, however, and depending on the particular requirements of the various consensus mechanisms, only few nodes in the network are effectively carrying out the verification process, which risks undermining the reputation and reliability of the consensus mechanism.

In addition, if blockchain applications are not only used for the simple transfer of payments but also for the execution of smart contracts with links to real-world assets, issues arise as to how to deal with ambiguity – which arises when two parties have differences in assessing whether certain contract clauses have been met or not –, how such differences can be resolved (i.e. the contestability of a blockchain) and how the link between the digital ledger and a real world asset can be insured and

safeguarded, an issue that is of particular concern in supply-chain applications and certification schemes.

Speakers and participants at our conference debated intensively on these different challenges as summarised in figure 2. A common thread was that solutions to these issues are specific to each of the various applications that were presented. Nevertheless, they all agreed that finding appropriate solutions to these challenges is relevant to ensure that public-private partnerships that build on the blockchain technology are able to deliver reliable and credible solutions in light of the ambitious sustainable development goals.

Figure 2: The four blockchain challenges

Interoperability

Ensure interoperability and stability

Privacy & Transparency

Find the right balance between transparency and privacy

Governance

to manage contestability with distributed governance and smart contracts

Ecological Footprint

Reduce the ecological footprint of DLT and the digital industry

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2.3   Why does DLT matter in global Sustainable Development?

Since the 2030 Agenda for Sustainable Development was signed by 193 countries, several goals were achieved but many more global challenges remain. Those relate to climate change, migration, technology and trade [5]. The Global Sustainability Report 2019 estimated that climate-related and geophysical disasters claimed around 1.3 million lives between 1998 and 2017 (ibd, page 23). As the report highlights, failure to achieve the SDGs by 2030 will result in permanent damages to our ecological and socio-economic fabric.

A people-centred approach at the core of sustainable development and DLT
The SDGs are a people-centred and universal plan which calls all countries, the developed and developing ones, and a multitude of stakeholders, for action. Figure 3 demonstrates their complexity. The adoption of a people-centred approach seems to be also one of the most critical factors for Blockchain-enabled solutions within sustainable development and humanitarian aid. Blockchain can make a real impact when solution-designers understand the complexity of sustainability issues. Such an understanding can be fostered when looking at the interconnections of the SDGs.
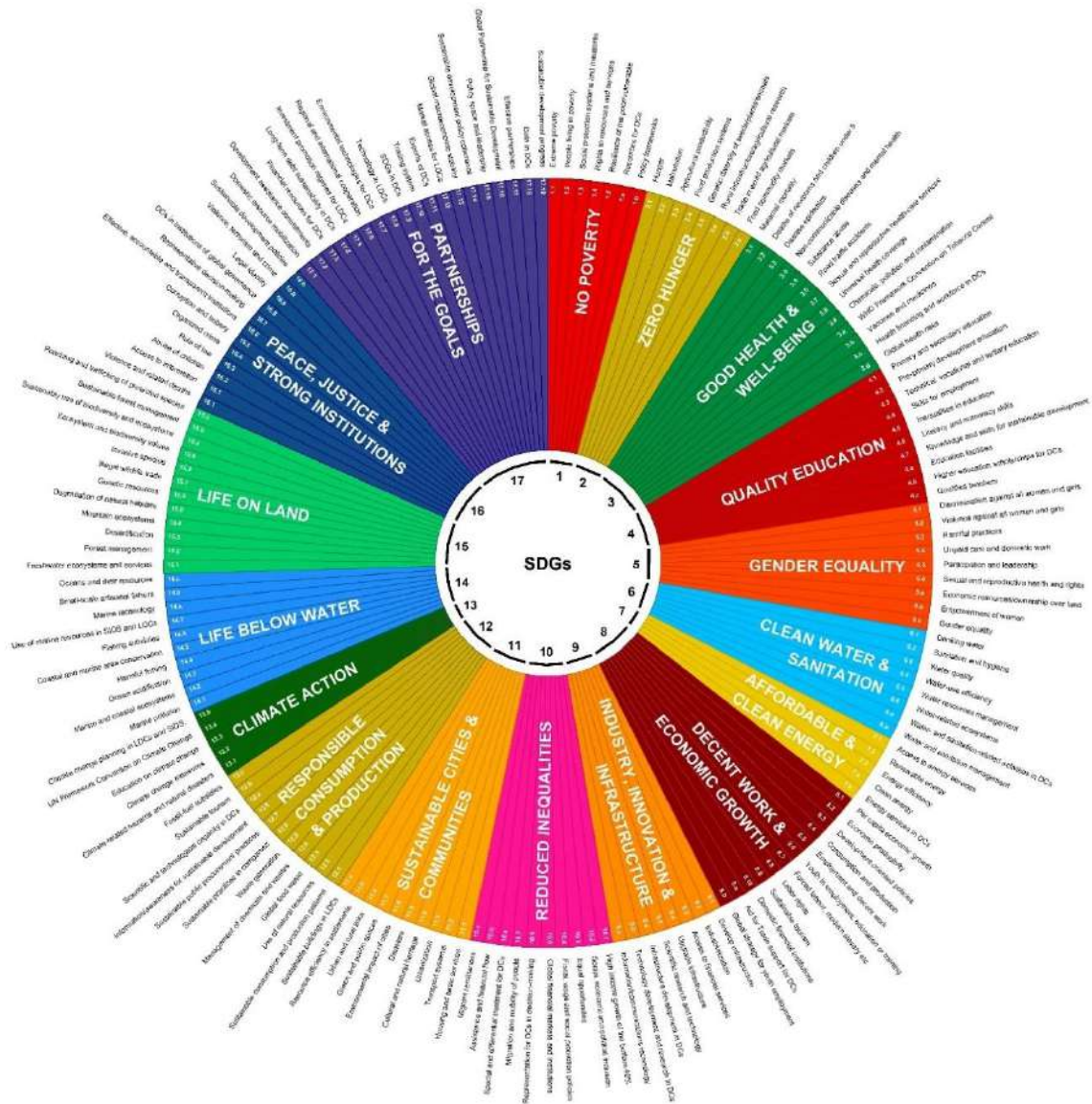
Source: Cook [6]

Decentralization is a central aspect for DLT and the achievement of the SDGs

Key to the link between blockchain technologies and Sustainable Development is the need for decentralized policy implementation. This requires introducing new sets of rules, a novel social order where instead of one authority, a wider range of stakeholders participate in a decision-making process. This is exactly the promise of DLT: No more intermediaries are needed to establish trust. Technical nodes provide authentication, immutable data records, and instant data-verification.

The SDGs were initially presented as a "clarion call to work in partnership to intensify efforts" as the former United Nations' Secretary-General Ban Ki-moon expressed it, to help economic growth and address a range of social needs, while tackling climate change. [7] This unprecedented agreement on Sustainable Development reflects also the shift from centralized towards decentralised systems.

> *"What's the economic value of decentralization? It's the establishment of democratic structures and trade ownership which creates trust in our society. [..] In the past, it was difficult to create a multilateral context because there were so many different interests of stakeholders. Now a shared ledger establishes trust and shareholders can easily interact with each other."* (Robert Zapfel)

DLT and impact investment

In this regard, blockchain offers new opportunities to channel private funds into projects that help address the funding gap for SDGs. [8] For the moment, however, private sector applications of blockchain are exploding while financing for sustainable development remains at risk. For instance, Official development assistance (ODA) is currently declining, from 2017 to 2018 about 2.7 per cent in real terms. [9] According to UNCTAD, there is an annual $2.5 trillion funding gap per year in developing countries alone to achieve the SDGs. [10]

> *"[The SDG funding] gap reflects the inability of traditional systems to respond to today's challenges."* (Inma García Sáez)

Leveraging private sources of finance for SDGs might address this issue. For instance, Gartner, a research and advisory company, calculated, that blockchain investments will account for a value more than $3.1 trillion worldwide by 2030. [11]

Figure 4: Blockchain Market Potential and SDGs Funding Needs
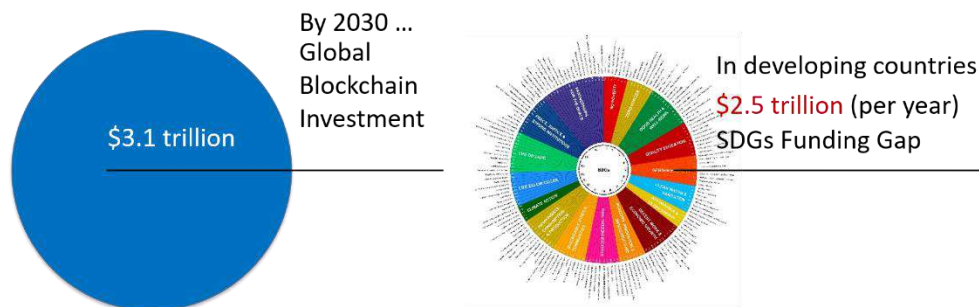
SDG financing already benefits from blockchain based cryptocurrencies. In October 2019, UNICEF launched a Cryptocurrency Fund to finance open source technology for children and young people around the world, a primer for UN agencies. With this project UNICEF co-leads the UN Innovation Network alongside the World Food Program (WFP). WFP is responsible for researching the potential and pitfalls of blockchain and other emerging technologies.

Even though the number of discussions on blockchain technology and its technical use-cases seem to increase, sustainable development is on the DLT agenda only since 2016. [12] Governments still struggle to use blockchain technology to support SDGs.

> *"People are somehow sceptical regarding the capabilities of these new technologies. Governments can play a very important role however when adapting DLT."* (Gianfranco Moi)

Blockchain "for good" just has started and needs more global fora

In 2017 only 15 UN entities carried out blockchain initiatives like Proof of Concepts, Scale Ups to Events and Workshops, Publications and Investments. [13] Since 2016, specific groups play an important role in partnership with players from the blockchain industry such as the ITU Focus Group on Application of Distributed Ledger Technology (FG DLT) [14] which supports DLT decision makers, or the Alternative Finance Lab (AltFin Lab) [15], an internal start-up, that run out of UNDP Istanbul's Regional Hub for Europe and CIS. These fora are an example of technical collaboration between large development actors and the corporate sector, including companies such as Aid:Tech, Global Goals, Impact Coin, or Deloitte. These collaborations demonstrate one crucial factor: Blockchain for good projects can benefit from strategic collaboration over different phases (Proof-of Concept until the launch).

A United Nations white paper on DLT and sustainable development published in March 2018 showcases the importance of blockchain technology's "versatility" to lead to new partnerships [16]. The same year, the "Blockchain for Social Good: Utilizing Blockchain to Aid Economic Development" discussions took place during the 73rd United Nations General Assembly (UNGA) in New York. These discussions were an important step for recognizing the significance of this technology to drive inclusive growth [17].

However, compared to the overall DLT market, Blockchain-4-Impact initiatives still represent a fraction of blockchain initiatives. Out of 450+ public events on blockchain and cryptocurrency applications [18] only few focussed on social or environmental impact. Besides the Geneva Macro Labs' *Blockchain-4-Impact* conference in September 2019, such discussions took place at only ten other conferences. This represent less than 3 per cent of the market.

> *"When it comes to applying blockchain to sustainability, it is easy to go down a 'rabbit hole' of blockchain theory. Ideas are needed but action is required."*
> (Curt Hopkins)

DLT is generating sustainable impact in particular sectors

Blockchain technology is generating social impact particularly in six sectors: agriculture, healthcare, insurance, public, retail and in the utilities sectors [19]. The majority of use-cases presented at *Blockchain-4-Impact* and other multi-stakeholder discussions demonstrate that DLT can focus on specific needs of a population. A particular striking example was given by refugees and their need to possess and have access to identity documentation and storage. Similarly, participants insisted on the rapidly growing need for cheap international transfers for the growing population of labour migrants that would like to transfer money back home to help their relatives.

The most comprehensive study on Blockchain and SDGs was conducted in 2018 by the Institute for Global Environmental Strategies in Japan [20]. The authors Rocamora and Amellina argue – based on the evaluation of 24 blockchain applications across four sectors (finance, business, government and

climate change) that "blockchain applications bear a strong connection to 11 of the 17 SDGs" [21, page 6], in particular on Decent Work and Economic Growth [SDG 8], Industry, Innovation and Infrastructure [SDG 9], Reduced Inequalities [SDG 10], and Peace, Justice and Strong Institutions [SDG 16].

Discussions at our conferences support the predominance of these impact areas. Hopes and concerns expressed around "Blockchain for good initiatives" revolved around these four SDGs and several aspects of how DLT could play a role in leveraging sustainable development efforts were debated at *Blockchain-4-Impact*.

> *"Blockchain technology is in early stages but has a tremendous potential in the area of corporate social responsibility […]. Eventually, the technology, if it receives the necessary support (legal, political, etc.), could lead the fourth industrial revolution towards a circular economy."* (Laurent Favre)

In particular, the following blockchain-based applications were discussed at Blockchain-4-Impact:

- ❖ Introducing new types of currencies (tokens) to engage with partners and incentivise funding behaviours. This includes supporting volunteering for community building and environmental protection (Derek Queisser de Stockalper);
- ❖ Using e-identities for verification of, for instance, diplomas or the identity of refugees – while risks of abuse or traceability need to be (and can be) managed (Jörn Erbguth);
- ❖ Preventing fraud and corruption by creating a digital and complete record of elections (Leonardo Gammar);
- ❖ Strengthening financial inclusion by increasing disintermediation, providing access to identity and banks and the flexibility to also function offline to meet people's needs who have no access to technology (e.g. by timestamping transactions and not putting them instantly on chain, by e-vouchers where only the vendor needs to have connectivity, or by locale representatives when only one person has access to digital services (Maike Gerike);
- ❖ Establishing trust between stakeholders who need to share data in a secure and accountable manner. Capital markets could be further democratized that way (Richard Byworth);
- ❖ Providing secure data provenance, controls data access and verifies identity information, which could be used to incentivise people to make better consumption decisions using tokenization (Curt Hopkins, koinrewards.io);
- ❖ Reducing complexity by making it easier to track assets and transaction such as with the the REBO (REinvented BOttle) initiative, which implements incentives to sacrifice the convenience of the traditional plastic bottles by tracking water intake and plastic bottles saved, transforming plastic bottles saved into collection credits and monetizing credits to fund plastic collections.

Some participants at *Blockchain-4-Impact* raised concerns about the reputation of Bitcoin (the cryptocurrency that made Blockchain a household name) might harm innovative "Blockchain for good initiatives". However some of the above initiatives can help improve DLT's reputation: e.g. "koinrewards.io" that promotes sustainable consumption by rewarding consumers with digital coins

when buying sustainably, the Swiss Better Gold Association, that is studying DLT-enabled applications for traceability of the origins of commodities, or the smart REBO bottle.

"Blockchain for good is the way to shift away from the bad PR associated with blockchain because of cryptocurrencies." (Pierandrea Quarta)

Blockchain technologies matter for the United Nations not only because of their abilities to store value, make payments or combat fraud. They are important for sustainable development because they allow to address specific interdependencies (like government & healthcare, government & financial services etc.). All of these affect how inclusively and effectively gaps and challenges in sustainable development are addressed. At the end of the day blockchain remains a technology. The transformative power towards more sustainable and fair societies depends on a governance framework that can help scale its impact.

The key to successful DLT implementation is a strategic alignment between partners from different sectors who have a stake in the project's key issues. Transparent incentive alignment between project partners is necessary for effectively addressing sustainable development goals with DLT, as it guides all stakeholders when they translate the SDGs and their related indicators intro concrete, measurable impact, leaving the macro-perspective of the SDG framework behind. Using DLT for social impact could accelerate the achievement of SDGs. Financial Inclusion and PPPs will be crucial in this context. Let us look a bit more closely at some of the *Blockchain-4-Impact* applications that we presented by our speakers.

3   Applications of *Blockchain-4-Impact*

The most publicized applications of blockchain has been around the development of crypto-currencies such as Bitcoin or Ethereum. The latter led to a wealth of other applications such as smart contracts, e-identity, transparent supply chains, trade as well as specific applications in the banking industry.

Moreover, the technology holds the potential to offer solutions for some of the issues arising from the digital economy, in particular as regards data governance and wealth inequality, by offering a mechanism to verify data provenance and developing a mechanism of data ownership. [22] As of today, however, none of these systems are fully operational even though significant resources are being spent to bring different applications to maturity.

A particular relevant application of this technology arises with the development of new, digital assets. Attempts in this area go beyond the introduction of yet another cryptocurrency, with a view of creating exchange platforms where un- or insufficiently protected assets, such as certificates, personal data and identities, can be certified, traced and, potentially, traded. This "code is the law" approach (Lessig, 1999) means that Blockchain is more a legal innovation than just a purely technological one. "Blockchain can take the role of a trustee that independently executes a legal contract. 'The Code is Law' allows the enforcement of rules, even where the existing legal system is weak." (Jörn Erbguth)

It presents a particularly interesting opportunity to address key challenges around the United Nations' Sustainability Goals, which aim at addressing key vulnerabilities of our current global socio-economic system. Different applications, notably in the sphere of sustainable investment and the green economy, are currently being developed but the entire industry is still in its infancy and results are not being expected before a consolidation of business models has been achieved. [23]

This has not remained without impact on international organisations, notably in the humanitarian field, such as the World Food Programme (WFP), the Red Cross, or the United Nations High Commissioner for Refugees (UNHCR). These different organisations explore the value of blockchain applications to roll out solutions, for instance, for cash-based transfers in refugee camps (WFP), for creating digital wallets to fund beneficiaries in disaster areas (Red Cross) or for exploring credential wallets for refugees to self-manage their data (UNHCR). These blockchain applications can make a real impact. But they also highlight the complexity of developing solutions in terms of managing people and different local conditions. [24]

At the *Blockchain-4-Impact*, several overarching themes for blockchain applications emerged to help working towards the SDG agenda: Cryptocurrencies and financial inclusion, value chain certifications, and democracy and voting. The conference also created the opportunity to bring together partners to develop new solutions to address environmental and inequality concerns. Let us have a closer look at these applications:

3.1   Fostering financial inclusion with cryptocurrencies

With the launch of the UNICEF Cryptocurrency Fund in October 2019, UNICEF is the first United Nations organization that uses cryptocurrencies to fund its mission. However, outside the United Nations system already a series of international non-profit organisations started to accept cryptocurrencies. These include Save the Children, United Way (the largest non-profit in the United States in 2017), The Red Cross, the Water Project and six biggest Hunger fighting charities of the world [25]. Their deployment blockchain technology allows them to track funds with more transparency and to use Smart Contracts that ease compliance management (e.g. payments against specific criteria).

A particular focus of these applications concerns the access to finance, especially for poorer households. At *Blockchain-4-Impact*, several speakers stressed the need to address financial inclusion with blockchain technologies and the significant opportunities to empower those who were left behind. The World Bank estimates that 1.7 billion adults in the world are still unbanked which has serious consequences as it can lead to a poverty trap.

This dilemma illustrates why digital money is a crucial issue for our societies and is not to be taken lightly. "We must understand our options and their consequences, and we must make a conscious choice", Raffo concluded. Financial inclusion, in this regard, is really cross cutting and affects the achievement of several SDGs as was stressed by Bertrand Perez, Managing Director of Libra Association:

> *"When looking at remittances: Bringing those flows of money on official ways would not only help people and reduce the costs but would also enhance global security because it would be harder for that money going to destinations, we don't want it to."* (Bertrand Perez)

In particular, it can help moving closer to achieve four different SDGs:

- Resolving poverty (SDG1). Having a bank account or storing money is a basic need for human beings, essential to address poverty.

- Gender Equality (SDG 5): 60 per cent of the 1.7 billion unbanked people are women. Helping them to protect their money means reducing the gender gap.

- Economic growth (SDG 8): Certain business models are only viable with access to finance, whether farming or small businesses. People can start to operate which they were not able to do before as they couldn't sustain those businesses.

- Partnerships for the goals (SDG 17). Cryptocurrencies aim at creating partnerships with various entities from different parts of the world in order to enable sustainable financial inclusion: If you want to go fast go alone, if you want to go far go together.

Derek Queisser de Stockalper added that DLT architectures and tools could transform one of our most ancient social technology, namely money as a mechanism of reciprocity, to help achieve better social inclusion and environmental sustainability. DLT architectures could enable the emergence of a new family of reciprocity mechanism that, if managed in a structured and just way, could combine the social efficiencies of ancient gift and barter reciprocity mechanisms, with the economic efficiencies of our modern monetary reciprocity mechanism.

> *"DLT architectures and tools could transform one of our most ancient social technology, namely money, to help achieve better social inclusion and environmental sustainability."* (Derek Queisser de Stockalper)

Inma García Sáez asked how we can make sure that the ways we innovate financial services includes those that are not served today, but also how can we make sure that everybody benefits from the

solution? Blockchain has similar opportunities for that. Blockchain could provide additional funding opportunities, create job opportunities and empower the many instead of enriching the few.

3.2   Certifying value chains

DLT has the potential to take global trade to the next level. The piles of paper produced through traditional administration processes might soon be relics of ancient days. Or as Pierre Maudet stressed: "[W]ith the use of the Blockchain technology we can take big steps forward regarding traceability and transparency".

DLT enables companies and suppliers not only to track the origin of a product, but to also prove their authenticity and quality in order to make sure that ethical claims and fair-trade practices are respected. This sounds like good news in times of repeated scandals that have shaken up the Fast-Moving Consumer Goods (FMCG) industry over the last years. New trust in food quality can be a consequence to wish for. In order to achieve this, a credible link between offline and online processes is essential and does not come without considerable costs. The offline infrastructure for blockchain is as important as the online one.

> *"[…] Information added to the blockchain is only as good as the offline verification process that guarantees the relevant requirements have been met offline. Once transparency and automated processes and payments are ensured, Blockchain has the potential to reduce trade costs significantly, including verification, networking, processing, coordination, transportation and logistics, as well as financial intermediation and exchange rate costs."* (Emmanuelle Ganne)

DLT could mean disruption for some sectors and categories of workers and not everyone might equally benefit from it. Those advantages however will only be realized if several key limitations are addressed.

Opportunities and limits of blockchain for the value chain

DLT has the potential to bring globalization to another level and give rise to a new generation of services. It can enhance the efficiency of processes within global value chains by enhancing transparency and guaranteeing quality and ethical standards.

Blockchain will open up new opportunities for micro, small and medium-sized enterprises (MSMEs) and small producers from developing countries. However, it is not suited to all situations and the technology is not a solution to everything. A careful and realistic evaluation is required before its implementation. In the case of commodities, [the potential of Blockchain in the area of corporate social responsibility] is already being deployed to allow better traceability. This means traceability of the origins of the commodities but also traceability of the destination of the impact money". (*Laurent Favre*)

For instance, the use of blockchain may create barriers if it is used for transactions that do not require high levels of reliability. Setting up a blockchain means significant investment and coordination efforts, as well as substantial changes to existing systems and culture.

It is difficult to assess how the deployment of DLT will affect trade costs. Cost reduction estimates in the financial sector and the shipping industry range from 15 to 30% of total costs. According to the World Economic Forum (WEF), the removal of barriers due to blockchain could result in more than US$ 1 trillion of new trade in the next decade.

Mind the digital gap!

Opportunities in international trade can only be realized if companies in all countries have the right technical skills and enjoy adequate internet access. The "digital island problem" has to be addressed to ensure interoperability, clear rules and regulated responsibilities. Without the proper infrastructure and regulatory environment, Blockchain will likely be confined to proofs of concept and pilot projects.

Comprehensive standards are key

For blockchain to make international trade smarter, smart standardization and cooperation is key. "We need to bring far more diverse voices to the table, particularly from developing countries and traditionally marginalised population", says Blanca Zutta from the International Token Standardization Association (ITSA).

"Once these standards for each layer are designed and built, the blockchain revolution will really begin." (Blanca Zutta)

Standards need to be built, adopted and applied at each layer: interoperability, terminology, security, privacy, intellectual property, data and identity management, rules of origin, and technical aspects of Blockchain.

3.3   Restoring trust in democracy and voting

Blockchain applications have also developed to restore trust in voting and democratic principles by increasing privacy. Robert Zapfel underlined that blockchain is about decentralisation in contrast to centralized authorities, which helps building up democratic structures and trust in our society. In the pre-DLT era, Zapfel highlighted, it was challenging to establish trust, in particular in a multilateral context with diverse interests of stakeholders. Thanks to the blockchain technology, dynamics have changed. Shareholders can now directly interact with each other without a central intermediary.

For our panelist Inma García Sáez there is a primary reason why we have created centralised systems, and this is "trust". "We are humans and we don't always do what we say or what we promise. We lie, we trick. Trust isn't a given. So, we have created trust intermediaries and trust brokers for that", she explained. Trust is central for the achievement of the SDGs since fraud and corruption are among the biggest barriers. Unclear property ownership and vulnerability to corrupt industries and fraud, undermines the ability for individuals, entrepreneurs, corporates to invest and has a negative effect on innovation.

Because DLT enables a transparent, decentralised and immutable system, it has been deployed in the past in a wide range of settings to strengthen democratic processes. Examples are blockchain-based e-voting systems which are being discussed since 2015. The European Parliament, for instance, discussed DLT e-voting systems in the context of their implications for the future of democracy,

concluding that a lot of the threats of such e-voting systems also apply to traditional paper systems, related to anonymity, coercion and accessibility [26].

At *Blockchain-4-Impact*, we discussed the use-case of Agora, a blockchain-based voting ecosystem that allows anyone anywhere to vote online from a digital device in a fully secure, easy and certain way. Based on three innovations, consensus is provided based on the digital signature of multiple nodes. The system incentives the auditing of elections since auditors are paid to monitor the consensus and the overall election. Vote-buying or forced voting are prevented with several measures in place. Fore examples, voters are identified securely before their actual vote submission. Voters may login from any device that has the voting application and vote as many times as they wish until the last second (only the last vote counts), they can even vote offline and as soon as the device reaches network, the vote will be counted.

3.4   Protecting wildlife by valuing natural capital

The blockchain technology offers solutions to turn real-world objects into digital assets with a view of providing a proper value for them. One example of relevance for achieving a greener economy is the flora and fauna that surrounds us. Maintaining biodiversity has been recognised for long not only as a goal in its own right but because different plants and animals contribute significantly to help us in regulating our climate, benefiting our agriculture or protecting us from natural forces at sea or on land. Most often, however, such natural capital is not valued properly and the disappearance of certain species is at best a headline in the news but not a budget line in a company's account.

Blockchain offers a solution to change this. Geneva Macro Labs, together with its partners, is currently developing an application to show the power of this technology in this respect. A particularly salient example is that of the blue whale or the whale species more broadly. As discussed by our partner and *Blockchain-4-Impact* speaker, Ralph Chami, whales contribute directly and indirectly to absorb a significant amount of carbon dioxide from the atmosphere. [27] But this contribution is by no means properly evaluated when considering that whales trade on the market – where it is allowed to hunt them and sell their meat – for roughly USD 50.000,--. This pales in comparison to its ecological value in helping to absorb carbon dioxide, and which is evaluated at several million dollars!

> *"We need to get the attention of policy makers. I think of the whale as an asset.*
> *So I use the capacity of a whale to capture carbon and I value it in dollar terms.*
> *That is what attracts policy maker's attention!"* (Ralph Chami)

But because there is no stock exchange where this contribution could be traded, only the actual meat value is currently be priced. Tokenisation with blockchain can overcome this limit. In particular, blockchain solutions can bring together several key technologies that help tracking the whale, attaching a particular carbon credit to each whale, tokenise this whale carbon credit and allowing impact investors to purchase such a whale token. Part of the investment in the token would then go to measures to preserve and possibly expand the whale population as "nature's solution to climate change" [28]. At Geneva Macro Labs, we are currently helping our partners to develop such a solution that combines economic interest with green returns.

3.5   Improving data governance

Blockchain can also offer solutions to address another concern high on the agenda of policy makers: Inequality (SDG 10). Indeed, inequality has increased significantly in advanced economies over the last three decades, as economies grew older, less dynamic and became more open to foreign trade. In the past ten years, however, a few Tech giants drove rising concentration of wealth and income on the back of a fast expanding data economy. Making use of individual information provided freely by users on social media or matching platforms, these tech companies turned data in "new oil", targeting users with individualised ads and offered targeted goods and services against a small fee of product placement. These companies quickly became dominant players in their respective markets, cutting out competitors and essentially serving customers globally.

The lack of a more equitable form of sharing such data economies has raised concerns and different solutions abound [29]. And there is one, that is particularly interesting from the blockchain point of view: A data union or data trust where the origin and usage of individual information can be traced and valued [30]). Rather than concentrating ownership of data collections among a small number of tech behemoths, blockchain offers a decentralized data governance model that help verify data, allow their traceability and guarantee appropriate returns and control to data providers. The latter is particularly important as different data providers would want to privilege or exclude the use of their data in specific circumstances. Most users, for instance, would be resistant to the idea that their data can be used to train autonomous weapon systems. In the current system of data governance, such a use cannot be excluded systematically. Data-unions and negotiating agents could help relieve the consent-model from its obvious failure.

In the pre-blockchain era, such a solution would not have been possible: Lack of trust among participants and the "double-spending" problem would have prevented such a solution. Indeed, once the data is provided, impossible to prevent it to be copied and diffused among a diverse and anonymous user base. This is exactly where blockchain solutions can come in. Different blockchain approaches have been offered to develop a decentralized data market place (Niforos, 2019). So far, however, the lack of standardization and data portability from one system to another as well as the fact that most application are industry-specific have prevented one particular model to strive and currently present the biggest challenge for the diffusion of such blockchain-based data trusts.

All these examples suggest immense potential for blockchain applications to address sustainability issues. But they also show that different obstacles hamper them to grow and provide effective tools to achieve the SDGs. To address this, the Geneva Macro Labs suggest five **Solutions**, which we will discuss next.

4   Solutions for sustainable blockchains

4.1   Setting up a Global Blockchain Observatory

As any new technology, developments and innovations should be followed by a range of observatories. At the inter-governmental level, so far only the European Union and OECD countries have set up such observatories that publish regular reports and recommendations on how the industry should be regulated and evolve. The EU Blockchain Observatory and Forum has the explicit mandate to promote the development of the blockchain technology in European countries.[31] The OECD

Blockchain Policy Centre is more modest and only offers guidance to policy makers on recent developments and challenges to look out for.[32] At the level of the United Nations, however, no such central observatory exist and efforts to follow and understand technological developments in the blockchain arena are scattered across different services. Given the cross-cutting nature of the technology and the likely profound implications not only for data governance but also for the legal system more broadly, this is a significant lack of oversight with adverse consequences notably for blockchain users in developing countries with less resources to address the specific challenges that follow from these innovations.

Therefore, we call for a global multi-stakeholder Blockchain Observatory, to be set up ideally at the level of the United Nations, and equipped with an encompassing mandate to look into technological, financial and legal implications of this new technology.

4.2   Fostering industry standards

With the proliferation of different blockchain approaches, interoperability has become a key challenge. There is currently no standard to transfer an asset from one blockchain to another. Intermediaries are often required to provide trust - intermediaries that were supposed to disappear with the blockchain technology. Also, very few standards regarding the set-up of smart contracts have yet been established and each blockchain offers its own possibilities to automatize certain decisions.

In particular, as regards the Sustainable Development Goals this might be a major limitation regarding a fast and efficient development of blockchain-based solutions. SDGs share a number of features that could be addressed by a standardized SDG-oriented blockchain approach. For instance, regulated access to public goods such as clean air and water or the unambiguous identification of specific right-holders (e.g. e-id cards for refugees or patients) are recurrent issues that arise in this regard. But standards are also necessary to ensure stability of blockchain-based transaction systems and help combat illicit finance.

Therefore, we call for the development of a new, uniform protocol in which *Blockchain-4-impact* projects can be developed and deployed in order to foster fast, efficient and targeted approaches across a range of SDG targets. Such a protocol should be developed in collaboration with policy makers, standards organizations and industry experts and should be accompanied by a secretariat that could help the standards to evolve according to new needs and technological innovations.

4.3   Offering safe spaces and sandboxes for innovation

Blockchain is still a very young technology. Bitcoins were first introduced in 2009 and appealed initially only to a small fraction of well-informed tech geeks. Ethereum, the blockchain platform that offers a significant extension necessary to link blockchain to impact projects was only introduced in 2015. Unsurprisingly, hype and despair have been intimately linked to different blockchain applications, triggering cynics to claim that it is simply sufficient to mention "blockchain" in a company report to be valued as the next unicorn on the stock market.[33] A danger, therefore, emerges that the technology is being derided before it actually has proven its fully potential.

Given the lack of standards and experience especially in the area of impact investment, implementing large-scale blockchain-based solutions run the risk of major failures, undermining trust in further applications. Hence, a careful and balanced approach is necessary to prevent such failure. Innovation

sandboxes and safe spaces, separated from the main operation of humanitarian agencies, for instance, can limit possible negative repercussions on the main business of these organisations. Whether implemented as innovation labs or through private-public partnerships (see below) or even via an arm-length approach by offering funding to external solutions, such innovation incubators can offer the right incentives for individual solutions to be tested, scaled up and integrated only when their longer-term benefits have become visible.[34]

Due to their built in decentralization, blockchain applications are ideally suited for such an approach. For *Blockchain-4-Impact* solutions to have a societal aspect hence it will be important to combine a sandbox approach with a blockchain observatory as suggested in our first solution. Indeed, only by comparing different solutions, understanding their opportunities and challenges in bringing them to scale and analysing the necessary organisational and regulatory changes for their success can we hope to achieve fast progress towards the sustainable development goals. We, therefore, call for case-specific, open-access innovation labs that offer decentralized tools for experimenting with different Blockchain-4-Impact approaches. Such innovation labs can be set up by the blockchain community itself, by agencies in the domain of humanitarian, social and environmental action, or through regulatory activism at the national and international level.

4.4   Regulating service providers and custodians

Policy action is needed, in particular, when real assets are transferred into the blockchain world, such as in some of the applications discussed before.

"The Token Economy needs a suitable legal framework. In Liechtenstein, we let the Token represent any existing rights, for example the ownership right of a diamond. We call it the Token Container Model." (Thomas Nägele)

In general, blockchain is technically protected against abuse. However, things can still go wrong. It is highly not the core technology, but service providers and custodians that can be the weak joints in the chain of trust. When non-blockchain assets are represented by tokens, the blockchains cannot be completely self-enforcing anymore. The law needs to be able to deal with trading tokens. Liechtenstein was the first country to create an appropriate legal framework for tokens. This new framework fits into the existing Liechtenstein and EU-laws and centres around tokens and assets represented by tokens. Currently the Liechtenstein approach is seen as a model for other countries.

4.5   Promoting public-private partnerships for Blockchain-4-Impact solutions

Within ten years of its existence, the blockchain environment has already delivered an astounding number of initiatives and projects. So far, however, too many projects still focus on the creation of yet the next cryptocurrency. As discussed in this Solutions Paper, the technology is offering many more applications, in particular in the area of the UN Sustainable Development Goals. To be effective and offer viable solutions in this area, private actors need to find reliable partners at the national or international level that work together with them in addressing specific SDGs. This goes beyond mere changes in the regulatory environment and requires an active engagement by public actors to engage

with the private sector. For instance, digital tokens that offer an investment vehicle for green investment funds need to be backed up by public certificates that allow them to access certain carbon trading platforms. This can be achieved through national or international agreements to declare a particular natural capital a public good.

Therefore, <u>we call national policy makers and international agencies such as the United Nations to promote partnerships with the private sector</u> in view of co-developing solutions that help achieve the SDGs.

Way forward

The blockchain technology offers a decentralised, tamper-proof opportunity to develop innovative solutions to help achieve the United Nations Sustainable Development Goals. Geneva Macro Labs, together with its partner, the United Nations Joint Inspection Unit, has offered a space for knowledge exchange, networking and experimenting around fresh ideas to develop and implement *Blockchain-4-Impact* tools.

Out of the experience of this conference and continued interaction with our participants and partners, this Solutions Paper offers a summary of the key ideas in leveraging this promising technology for impact investment vehicles.

The discussion will not stop here. But we hope that we can contribute by indicating a limited number of practical and concrete steps in moving towards a shared goal: **Achieving the SDGs**.

List of speakers at the "Blockchain 4 Impact" conference

Séverine Ambrus	RTS
Guido Bühler	SEBA Bank AG
Richard Byworth	Diginex
Jessica Camus	Diginex
Ralph Chami	International Monetary Fund
Olivia Chang	CNN Money
Petru Dumitriu	United Nations Joint Inspection Unit
Jörn Erbguth	University of Geneva
Ekkehard Ernst	ILO, Geneva Macro Labs
Laurent Favre	A. Favre et fils
Reto P. Gadient	B.ACADEMY
Leonardo Gammar	Agora
Emmanuelle Ganne	World Trade Organisation
Inma Garcia Saéz	Scrypt.media
Maike Gerike	Scrypt.media
Renate Günther	Geneva Macro Labs
Curt Hopkins	koinrewards.io
Pierre Maudet	Councellor, State of Geneva
Gianfranco Moi	State of Geneva
Thomas Moser	Swiss National Bank
Thomas Nägele	Nägele and Co., Liechtenstein
Bertrand Perez	Libra Assocation
Pierandrea Quarta	REBO Bottle
Derek Queisser de Stockalper	Qanalytics
Emilie Raffo	Blockchain4Humanity (b4H)
Alessandro Sanos	Refinitiv
Alexander Schell	CryptoValley Association (CVA)
Marianne Schörling	Geneva Macro Labs
Paul Wang	Mt Pelerin
Robert Zapfel	iov42
Blanca Zutta	ITSA

In a nutshell: What is a blockchain?

Blockchain is part of a wider group of technologies known as "Distributed ledged technology" (DLT) and refers to a protocol by which several identical copies of a database are stored among participants of the network. Updating the database (and its copies) in a synchronised manner requires consensus among the parties involved using various forms of consensus protocols.[35] The consensus protocols used depend on the type of blockchain and, in particular, whether it is a public or private one. In the latter case, a centralized validation mechanism determines whether a possible participant is accepted or not, which can simplify the consensus mechanism used and speed up the transaction time.

The most publicized applications of blockchain has been around the development of crypto-currencies such as Bitcoin or Ethereum. Especially the former made significantly headlines during the second half of 2017 when its trading price hit almost 20'000 dollars in December 2017, an increase of more than 2000 per cent in that year. The hype disappeared rapidly as the bubble burst in the wake of regulatory scrutiny and market re-assessment of the true potential (or lack) of this type of systems to replace or at least effectively compete with modern centralized electronic payment systems. Recently, renewed attention arose around the announced by Facebook to launch its own blockchain-based cryptocurrency, called Libra, triggering wider concerns regarding privacy and financial stability that such an initiative might cause.[36]

Where did discussions on blockchain in 2019 focus on social and environmental impact?
➔ Geneva Macro Labs and United Nations' Joint Inspection Unit's *Blockchain-4-Impact* conference
➔ The 73rd United Nations General Assembly (UNGA)
➔ Blockchain for Social Impact Conference 2019 on Building a Resilient Future [37]
➔ Blockchain for Social Good prize by the European Innovation Council that aims to aims to develop solutions to social innovation challenges using distribute ledger technology [38]
➔ Blockchain for Social Impact Coalition (BSIC) conference in June 2019, New York, that incubates, develops, and implements confederated blockchain products and solutions that can address social and environmental challenges across the United Nation's Sustainable Development Goals [39]
➔ Stanford Graduate School of Business on moving beyond the hype with Blockchain for social impact [40]
➔ IBM Blockchain Forum on how blockchain helps humanitarian efforts [41]
➔ The Blockchain for Social Good Summit hosted by the International Civil Society Centre and Net Hope in conjunction with Oxfam, Mercy Corps, the University of Edinburgh, and World Vision [42]
➔ PositiveBlockchain.io, an open-source database, media platform and community exploring the potential of blockchain technologies for social and environmental impact. [43]
➔ Blocked Fest on Blockchain for Social Good & Impact - San Francisco, United States
➔ Impact Investment & Sustainable Investing Conference, that took place in April 2019 in London (UK)

Acronyms

AI	Artificial Intelligence
DLT	Distributed Ledger Technology
CSR	Corporate Social Responsibility
EU	European Union
E-identity	Electronic Identity
ESG	Environmental, social and governance factors
ICRC	International Committee of the Red Cross
IEO	Initial Exchange Offering
ICO	Initial coin offering
ITSA	International Token Standardization Association
ITU	International Telecommunication Union
NGO	Nongovernmental Organisation
ODA	Official development assistance
OECD	Organisation for Economic Co-operation and Development
SDG	Sustainable Development Goals of the UN
STO	Security Token Offering
UN	United Nations
UN JIU	United Nations Joint Inspection Unit
UNCTAD	United Nations Conference on Trade and Development
UNDP	The United Nations Development Programme
UNGA	United Nations General Assembly
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
WEF	World Economic Forum
WFP	World Food Program

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