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ON SCIENCE AND TECHNOLOGY FOR DEVELOPMENT (CSTD)**

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Contribution by ESCWA

to the CSTD 2020-2021 priority theme on “Harnessing blockchain for sustainable
development: prospects and challenges”

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PRIORITY THEME 1: Harnessing blockchain for sustainable development: prospects and challenges

United Nations Commission on Science and Technology for Development (CSTD)

Dear international organization/UN entity/agency,

As you are aware, the CSTD 23rd annual session selected “Harnessing blockchain for sustainable development: prospects and challenges” as one of the priority themes for its 24th session (2020-21 period).

In an increasingly digitalized economy and society, the security and accountability of data transactions are critical elements for creating trust and enabling breakthrough innovations in the digital world. In this regard, blockchain technology has been perceived as a game-changer, with the potential to revolutionize processes from finance to pharmaceutical industries, from humanitarian work to development aid. The blockchain serves as the base technology for cryptocurrency, enabling open (peer-to-peer), secure and fast transactions. The application of blockchain has expanded to include various financial transactions (online payments and credit and debit card payments) as well as IoT, health and supply chain. However, issues associated with scalability, privacy concerns, uncertain regulatory standards and difficulties posed by the technology in integration with existing applications are some of the potential market constraints. The priority theme will focus on the importance of developing a local financial infrastructure that avoids the financial exclusion of the most vulnerable communities. There is also the risk that the potential of blockchain for solving developmental problems had been somewhat inflated by its early adopters and the tech media and may not be as applicable for developing and least developed countries. What are the emerging uses of blockchain that can be breakthroughs in accelerating progress towards the SDGs? What are the potential negative unintended social and economic effects of this technology? How could governments maximize the opportunities and minimize the risks? The CSTD could consider this priority theme to examine the potential of harnessing blockchain for sustainable development.

The CSTD secretariat is in the process of drafting an issues paper on the theme to be presented at the CSTD inter-sessional panel meeting. In this context, we would like to solicit inputs from international organizations, UN entities and agencies on this theme. We would be grateful if you could kindly answer the following questions based on your organization’s work.

1. Could you share specific examples, projects or initiatives that have used or plan to use blockchain technology for the SDGs? What are the main challenges confronted while trying to implement these projects/initiatives? (Examples may include blockchain solutions for financial inclusion, trade facilitation, supply chains, health, energy, e-Government, etc.)

ESCWA have been exploring the potentials of Blockchain technologies on the provision of its services to member countries within its mandate related to social and economic affairs. For example, ESCWA is considering the use of Blockchain technologies in managing COVID-19 in airports in partnership with International Chamber of Commerce and OakPass. Some Arab countries (ESCWA member states) have been considering several applications of Blockchain in their development processes as well. ESCWA stood ready to support these countries upon their requests. Additionally, ESCWA has been exploring provision of member states with policy advice and policy support in this area.

At a global scope, Blockchain has generated lots of steam since it was firstly introduced in 2008. Soon after, myriad organizations have caught up to develop, implement and optimize this technology to better serve humanity. The United Nations was one of the prominent advocates for this technology and even made breakthroughs in its innovative implementation beyond the standard context. An example of this would be the “Building Blocks” initiative by the World Food Programme, or WFP, which contributes straightforwardly to SDG #2: Zero Hunger.

The WFP implemented blockchain solutions in this regard to facilitate humanitarian relief distribution where the WFP used blockchain to organize the provision of cash assistance to the needy. This approach revolutionized the traditional ways of accessing needy families around the world; as stated

by Farman Ali, a worker at the organization's regional office in Karachi, Pakistan. He alleges that "blockchain can bring us closer to the people we serve and facilitate; We respond more quickly." This was a prototyping attempt to frame the process of administering the technology in typically Least Developed Countries with various technology restrictions. Its success indicates the feasibility of scaling-up the initiative as part of the Innovation Accelerator Program.

A second example entertains the decrees of SDG #14: Life under Water. Recently, a new realization of this technology has emerged; regulating fishing in the high seas and protecting ocean biodiversity. The UNHQ at New York mentioned terms for blockchain utilization in its treaty to protect ocean resources with the goal of reaching a final consensus among parties. Blockchain was tapped on for its ability to remotely monitor and track fishing operations in the deep seas and identify activities that are not legitimate as per the agreements of the effective treaty.

Dominic Waughray, Director of the Global Public Goods Center at the World Economic Forum, proclaimed that technology is the definitive answer to the enforcement of the measures bound by the treaty. In a practical experiment to test this technology, identification codes were placed on fish in waters, dividing water regions and not one-by-one labelling, with international disputes concerning fishing regulations and uploaded those codes onto a platform powered by "blockchain" technology. These codes can be scanned electronically in order to increase the transparency of supplier chains so that companies and customers can confirm the source of the tuna sold by retailers.

In the same boat, blockchain was able to impact SDG #1: No Poverty. The developing world often lacks regulations to protect depositors' money in banks and laws that regulate compliance with official contracts; thus, services are absent or available at a cost that is too high for the majority. For example, in some African countries, banks are required to open a deposit account for amounts that exceed the annual income of the average person. Since blockchain offers a secure database of trusted agents and inherent documentation and security of transactions, it will allow any amount of money to be kept secure and confidential. In developing countries, the most important benefits of blockchain today are in four main areas: remittances, insurance, support for small businesses, and identity verification.

2. What are the challenges that governments have faced or may face for promoting innovation and competence building in blockchain, to contribute to their national development priorities and accelerate the progress towards the SDGs?

The main challenges arose during implementation included:

- (1) The policy makers' perceived instability of the technology
- (2) Lack of readiness of the technological infrastructure at local level
- (3) Most countries are distracted with other pressing issues such as poverty, lack of security, lack of financial resources, etc.
- (4) Difficulty achieving full transparency of transactions in supply chains. Transparency is the main feature of blockchain, without it, the whole concept will not be effective. However, disclosing some types of data may be undesirable. This has to do for protecting the identity of suppliers, actual levels of demand and available inventory. Typically, disclosure is carried at the level of regulatory bodies only such as the customs.
- (5) Most supply chains have their data confidential and are reluctant to relocate or share their databases. This creates a rigorous and monotonous task of understanding what must be hidden and what information can be revealed.
- (6) Data producers' desire to use the comprehensive data system for forecasting and planning without disclosing the primary data due to the absence of incentives to share accurate predictions-related information with partners.
- (7) Companies' tendencies to hide important information to preserve a competitive edge.
- (8) The aptitude for corporations to verify the information authenticated in the blockchain without seeing it. This typically occurs when verifying information may be costly and time-consuming. For example, an aviation and space company may have a joint venture to assemble an aircraft engine that consists of millions of parts, and thus companies must share their individual part numbers without engaging in prior verification processes in order to coordinate procurement and assembly on time.

3. What are the actions that the international community, including the CSTD, can take to contribute to harnessing blockchain for sustainable development?

The international community, and the UN community in particular, can invest in blockchain solutions for data protection, authentications, certification, COVID-19. This is paramount as it involves not only technical initiatives but legislation and regulations to pace up with the breakthroughs stemming in blockchain and its respective technologies such as cryptocurrency. Such steps include frameworks, protocols, and platforms that improve data privacy and confidentiality. The following are four proposed blockchain data protection actions to be taken:

- (1) Define a strategy that maps the kind of data to be enacted for Blockchain applications. Doing so will harmonized protection concerns with selectively identifying the suitable data to be recorded by the blockchain.
- (2) Employ a *Smart Contract System* which allows each user, according to his role, to access certain information and decode it to read or write it. Thus, not all information will be available to everyone and every user will have as much as they are allowed to access.
- (3) Vocalize the viability of Zero-Knowledge Proof: It is a well-established concept in encryption that allows one party to assert the accuracy of data without revealing the basic facts that make the statement true or false.
- (4) Invest in advanced full-fledged encryption: It is a method for performing calculations on encrypted data and preparing an encrypted result so that there will be an apparent blackout of the data. This will leverage blockchain as the only tool to independently verify the encrypted data and add an additional security layer in the process.

4. Could you suggest some contact persons in your agency responsible for projects/policies and international collaboration in this context as well as any experts (from academia, private sector, civil society or government) dealing with projects in this area? We might contact them directly for further inputs or invite some of them as speakers for the CSTD inter-sessional panel and annual session.

- Haidar Fraihat, Senior Adviser to the Executive Secretary of ESCWA on Innovation and Technology, fraihat@un.org
- Nawar Alawa, ESCWA Regional adviser on ICTs, alawa@un.org

5. Do you have any documentation, references, technological assessments, future studies or reports on the priority theme?

- (1) ESCWA Government Electronic and Mobile Services (GEMS) Maturity Index
- (2) AI for Good Summit
- (3) UN e-government Survey 2020
- (4) The SG Strategy on Technology
- (5) IEEE Xplore Digital Library
- (6) IEEE Spectrum Magazine for emerging and pressing technology innovations

Please send your responses and any further inputs on the theme to the CSTD secretariat (stdev@unctad.org) by 7 October 2020. We look forward to receiving your valuable inputs.

Sincere Regards,

CSTD secretariat

ESCWA Contribution on:

PRIORITY THEME 1: Harnessing blockchain for sustainable development: prospects and challenges

1. Could you share specific examples, projects or initiatives that have used or plan to use blockchain technology for the SDGs? What are the main challenges confronted while trying to implement these (supply chains, health, energy, e-Government, etc.)

- Based on a technical cooperation request received from the Ministry of Transport and Communication (MoTC) in Qatar, ESCWA implemented a 2-day capacity building workshop on Blockchain Policies and Applications, on 26-27 Feb 2020.
- In the framework of its project on "Technology and Innovation for developing land transport in the Arab Region", ESCWA looked at the role of Blockchain in developing this sector, however, it seems that the application of Blockchain is still limited in the land transport.

2. The ecosystem of innovation related to blockchain technologies sets the rate and direction of innovation and competence building on the blockchain technology. Regional ecosystems of innovation have particular characteristics due to existing specialization in specific industries (e.g. financing, insurance, trade), access (or lack of) to existing functioning centralized services (e.g. digital payment systems), and the social context related to the perception of risk and opportunities for speculative gains. Please share information about the regional ecosystem of innovation in blockchain in your region (or subregions) by informing: What are the key industries/specific sectors that are pioneer in blockchain innovation in the region? What are the key actors in the regional ecosystem of innovation (entrepreneurs, development teams (firms), venture capital, Banks and financial services, academia, regulators)? What are the key networks of the ecosystem in your region (including online networks, innovation hubs, forums, etc.)? What are the national strategies, policies, laws and regulations (in place or preparation) related to blockchain in your region? Please also give an indication (could be anecdotal) of the social context related to the perception of risk and opportunities for speculative gains with blockchains in the region (or subregions/ selected countries).

- Academia and research institutions (AUB, LAU, Lebanese University)
- Business accelerators and incubators (Berytech, Flat6Labs,...)

3. What are the challenges that governments of the region have faced or may face for promoting innovation and competence building in blockchain, to contribute to their national development priorities and accelerate the progress towards the SDGs?

Lack of awareness

Lack of skills to develop BC applications

Need to update the current legal framework to cope with BC deployment

Need to develop national policies

4. What are the actions that the international community, including the CSTD, can take to contribute to harnessing blockchain for sustainable development?

- Share lessons learnt
- Disseminate the most relevant applications and success stories of blockchain in various development sectors.
- Contribute to awareness raising and capacity building development for government officials in the Arab region

5. Could you suggest some contact persons in your agency responsible for projects/policies and international collaboration in this context as well as any experts (from academia, private sector, civil society

or government) dealing with projects in this area? We might contact them directly for further inputs or invite some of them as speakers for the CSTD inter-sessional panel and annual session.

6. Do you have any documentation, references, technological assessments, future studies or reports on the priority theme?

in its various publications, ESCWA highlighted the role of blockchain, as one of the emerging technologies, for accelerating the achievement of SDGs in the Arab Region. The main references are:

- Arab Horizon 2030: Technology and Innovation Perspectives for achieving SDGs in the Arab Region
<https://www.unescwa.org/publications/arab-horizon-2030-innovation-perspectives-sdgs-arab-region>
<https://www.unescwa.org/sites/www.unescwa.org/files/uploads/arab-horizon-2030-innovation-perspectives-sdgs-arab-region-summary-english.pdf>
- Impact of Fourth Industrial Revolution on Development in the Arab Region
<https://www.unescwa.org/publications/impact-fourth-industrial-revolution-development-arab-region>
- Technology for Development Bulletin – 2018,
https://www.unescwa.org/sites/www.unescwa.org/files/publications/files/technology-development-bulletin-2018-arabic_0.pdf