# The TọrọNet Project

Making the promise of a better future, enabled by blockchain infrastructure, a reality for millions.

## White Paper

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# TọrọNet Project Papers

The project papers are in 3 parts. The white paper, which presents a description of the TọrọNet Project is part 1 of 3 papers; Part 2 { the green paper} describe the technical features of the underlying blockchain infrastructure ( TọrọNet Chain) , network and ecosystem; and , Part 3 { the yellow paper} describes the governance and administration of the ecosystem

**This Document is not a Prospectus.**

These 3 documents does not constitute nor imply a prospectus of any sort. No wording contained herein should be construed as a solicitation for investment. Accordingly, this whitepaper does not pertain in any way to an offering of securities in any jurisdiction worldwide whatsoever. Rather, this whitepaper constitutes a technical description of the functionality of the **TọrọNet** chain.

**This Document is not a final design specification**

These documents does not constitute nor imply a final design specification of **TọrọNet** project, technology and governance arrangements .. Information presented on these papers, technical or otherwise, is meant to outline the general idea of TọrọNet project, its design and its use-cases and is subject to change with or without notice. For the latest up-to-date technical specification, check out the updates and documentations on the testnet explorer https://testnet.toronet.org/ or the mainnet explorer at https://toronet.org/explorer/.

# Part 1
# The TộrộNet Project

## 1.0 Description of the TọrọNet Project

**Abstract**: The Tọrọnet project was conceived in April 2017, to provide game-changing solutions to problems that have limited the ability of persons and economies in emerging markets to achieve their aspirations through an underlying blockchain (TọrọNet) infrastructure.

TọrọNet is a blockchain specifically dedicated for the building of decentralized financial applications that provides solutions to real world problems facing people in emerging markets. The infrastructure is optimized to enable participants in the network to improve their lives in the real world through access to decentralized financial services built atop the blockchain.

The technology is specifically optimised for solving the problems digital, economic and financial inclusion. The Tòrònet Project is about using the Tòrònet chain to solve the following inclusion problems in emerging markets :

(1) Digital economy: by enabling participants in the network to have access to smart phones which is their gateway to information, economic and financial inclusion.
(2) Shelter economy: by providing access to affordable &sustainable housing which is their starting point into building generational wealth.
(3) Financial economy: by providing access to low-cost capital including remittances which is their tool into building a credit history that supports their financial inclusion & access to capital.
(4) Energy economy: by enabling access to cost-effective non-fossil fuel-based energy which is their tool for creating value from their time and contributing to a net zero carbon word.
(5) mechanism for reducing the levels of pollution in the environment; and
(6) Agriculture economy: by enabling producers (farmers) + industry (processors) + their value chain/ supply chain + consumers access to functional markets that are close to home, which is the mechanism for solving the hunger problem, reducing poverty and creating jobs.
(7) Nature economy: by providing token-based incentives for regenerative economics including, but not limited to, plastics recycling and carbon sequestration i.e. the creation of carbon sinks through nature preservation/tree planting /reforestation schemes, which is a
(8) Ubuntu (& Omenani) Economy: by staking 20% of any revenues the users of the TòròNet technology generates into sustainable development projects that support the achievement of the SDGs linked to the above 6 use cases in needy communities.

TọrọNet Chain is a custom built blockchain infrastructure and network that leverages the tokenization + smart contract functionality of the blockchain to create a system that enables members of the network to build and offer DeFI apps and services that enable them to leverage { staking } their holdings of the native crypto asset {The Tọrọ} other tokens built on the platform to underwrite the provision of finance to each other either as a peer-peer or peer- financial institution- peer framework. **TọrọNet** combines a monetary + economic system with a smart contract execution mechanism. The network has created a model in which the financing is de-risked for provider and borrower through the innovative application

of smart contracts. The underlying system also serves as a peer-to-peer payment system. It also enables developers to build ERC20 compliant tokens and crypto currencies.

The essential idea is that network members (nodes) and application developers build, on the TọrọNet chain, various services in the 7 areas listed above so that those unable to achieve their life-aspirations, because they are excluded from financial services, can do so on the Toronet network.

The TọrọNet project is governed by the Switzerland based technology for good {Tech4Good} solutions organization - the TọrọNet Association that utilizes blockchain technology to solve problems in developing economies thereby improving the lives of millions of people around the world, starting from the African continent.

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## 1.1 Executive summary

The first blockchain was deployed in 2009 by Satoshi Nakamoto,[1] who gifted Bitcoin to the world. In the original paper, Bitcoin was described as a form of digital cash system.

The blockchain introduced several unique features into the world of finance in a congruent manner, including establishment of a public decentralized platform, peer-to-peer payment system, a transparent record of data, and a virtually immutable ledger system.

The concept has since been expanded to include development of programmable assets, thus enabling digital money and any asset denominated on the blockchain not just as a means of exchange but also as a programmable contract system.[2,3,4]

These features potentially could enable persons and businesses in developing contents to leapfrog into first world financial services and improve their economic well-being.

Our analysis also revealed that the adoption of a 21st century technology, specifically a blockchain with advanced smart contracts, is a critical enabler that allows 3rd world contexts to leapfrog into 1st world possibilities. TọrọNet aims to solve a wicked problem {*I have a need or aspiration but cant achieve it* } that impact billions that traditional financial institutions & current blockchain networks and solutions have not provided answers to .

## 1.2 The Problem

TọrọNet project is envisioned and designed to empower millions to fulfil their aspirations for a better life. While there were many capable [fit-for-purpose] commercial blockchain platforms for crypto-currency trading in existence, the lack of blockchain platform that is designed to solve the problems affecting real people made us decide to opt to build TọrọNet

Economic empowerment [and inclusion] of the poorest and most vulnerable people in developing economies, Africa, Latin America, South-East- Asia and the forgotten of North America /Europe is a foundational mechanism for solving the poverty & hunger problem .

For instance, some existing and emerging blockchain networks have included promises of providing solutions to the financial needs of the unbanked and underbanked communities. By focusing on the elimination of intermediaries, these networks have promised to be able to reach farther into communities that do not have ready or easy access to financial institutions. However, more than ten years into the deployment of blockchains, the percentage of the unbanked or underbanked that have been lifted up or served consistently by blockchain networks remains dismally small to non-existent in most communities. This is the problem that we have sought to address.

Some of the reasons for the impaired impact include:

1. Many blockchain networks create currencies and assets that those in the target communities are not familiar with.
2. Many blockchain networks create currencies and assets that are unwittingly so inflationary that their values are not stable enough for use in day-to-day commerce. As such, they are more amenable to speculative investment or for use as digital gold in a world of deliberately inflationary fiat currencies.
3. Current blockchain networks do not provide the means or last mile solutions to convert easily to and from local currencies, whereas they are also not yet accepted by local merchants for commerce.
4. Some of the existing blockchains are not fast enough for use in commerce, and many are not scalable enough to accommodate enough transactions for real world use. Many also consume excessive amounts of electrical resources to operate.[6,7]
5. The network and transaction fees of many existing blockchains are prohibitive for use in commerce in communities which do not have the means to accommodate sizeable fees per transaction.
6. Ease of use remains an issue for some of the technological clients built to access many existing blockchains.
7. There does not exist direct and deliberately conceived smart contracts addressing the financial markets and activities germane to the referenced communities.
8. Besides providing a blockchain network, the truth is that there needs to be operational processes designed together with such a network that will result in penetration and adoption within these communities.

TǫrǫNet seeks to provide a comprehensive solution that addresses limitations of both types of approaches described here. The solution is based on a blockchain solution but also combines this with an operational framework that will finally truly provide financial access and spur accompanying development and growth.

## 1.3 The Solution

The **TǫrǫNet** Project & its capacity to make the promise of a better future, enabled by blockchain infrastructure **TǫrǫNet** Chain, a reality was specifically designed to address the gaps identified above.

By utilizing a blockchain solution, the network provides the advantages a blockchain network delivers, namely: access to peer-to-peer transactions, security, trust, and immutability that exists with core

blockchain ledgers. Finally, the network delivers a smart contract platform that allows the development of financial contracts developed directly for the key financial activities or relevance in our target communities.

The network also has the following features to address the gap in current blockchains that have hampered or completely prevented their use in these communities:

1. The TǫrǫNet chain is developed as a new system of interconnected stable-coin and related derived contract assets that are denominated in local currencies, and in a manner that is immediately more natural to people we consider to be our core stakeholders. This constitution of TǫrǫNet results in tokens that are amenable for commerce. The system of integrated and derived stable coins are described in greater details later in the technology sections paper.

2. We have designed the TǫrǫNet chain as a dedicated Turing-complete blockchain, with the capability to administer contracts for the decentralized finance (TǫrǫNet) ecosystem.

   The function set includes among others:

   - Development of stable coins denominated in the local currencies in each community.
   - Decentralized lending contracts supporting smart phone access, sourcing, and purchase.
   - Tokenization of physical and virtual title system (NFTs).
   - Decentralized lending based on tokenized real-world assets.
   - Comprehensive transferable and tradeable collateral system.
   - Tokenized marketplace operations.
   - Decentralized Ricardian loan system.
   - Decentralized grant and subsidy system.
   - Decentralized pricing oracles
   - Decentralized exchange consisting of local currency and digital assets, tokens, and token derivatives.

3. Built into TǫrǫNet chain contracts and operations are game theory incentives for all participants to enable fulfilment of the agreed financial terms in the contracts. The operational processes leverage the local knowledge of each participant in the network as well as provide reward incentives within the contracts.

4. Integration of the stable coin tokens, derivative tokens, and assets on the blockchain with the financial activities of the communities is achieved by providing last mile structures, including a highly user-friendly clients and mobile apps. Last mile conversion between local currencies and equivalent stable coins are provided through the apps, as well as process champions and members of the communities incentivized through the smart contracts.

## 1.4 How TǫrǫNet Project transforms financial services via Defi

Current Blockchain Decentralized Finance (DEFI) Design

Current DEFI implementations currently do not accommodate unsecured loans, nor has any provision for third-party activities such as repossession, or credit scoring typical with traditional finance. A loan is usually secured by depositing some asset on the blockchain, and the loan contract on the blockchain

then mints the loan value from those assets. To ensure that there will never be a debt collection situation (since there are no typically no third-party involved), the loaned amount is usually a fraction of the reserved asset or collateral. This is usually termed the collateralization ratio. If the value of the asset fluctuates lower, the borrower is required to either deposit more collateral value or risk liquidation when the loan amount exceeds the collateralization ratio. Therefore, defaults are not an issue, and loan administration costs are usually non-existent and enforced by code. This leads to potentially cheaper loans. Usually the collateral is some other blockchain token such as Bitcoin, Ethereum, etc. Needless to say, most potentially in need of development loans in underserved communities do not have cryptocurrencies lying around to deposit in DEFI contracts to obtain loans.

Traditional Finance (TI) implementation Design

A loan portfolio usually consists of a number of loans of two types – secured and unsecured loans. In the case of secured loans, in the event of a default the collateral is liquidated and the loan value is recovered, ideally. For many loan types, including mortgages and auto-loan, the purchased item is usually the security, which is then repossessed in the event of a default. For unsecured loans, in traditional finance, the borrower is analysed using a combination of borrower history, credit scores, as well as other proprietary formula and computation to build a loan portfolio. A default rate is expected, and the goal is to minimize that rate over a loan portfolio. There is a significant loan administration cost associated with managing loans in traditional finance. Combined for both secured and unsecured loans, the interest rate reflects the risks and the loan administration costs. Besides covering the prevailing underlying capital interest rate in the jurisdiction, the loan portfolio's interest rate needs to set to additionally cover the loan administration costs as well as cost of defaults within the overall portfolio. This makes traditional finance loan interest rates potentially less competitive than blockchain DEFI loans.

Crowd Funding (CF) Implementation Design

This form of funding utilizes a combination of loaners to form the composite loan to a borrower. This has gained some use recently in both non-blockchain implementations and in blockchain implementations. Initial coin offerings of blockchain projects are actually a form of crowd funding. When implemented on a blockchain, a third-party intermediary may not be required, and the terms of the loan or funding can be implemented in a smart contract. Crowd funding reduces risks to the funding sources since each is only exposed to the tune of a fraction of the total loan. However, most crowd funding implementations are also skewed in favour of the borrower, do not require collateral, and default usually results in the funding sources without much recovery recourse.

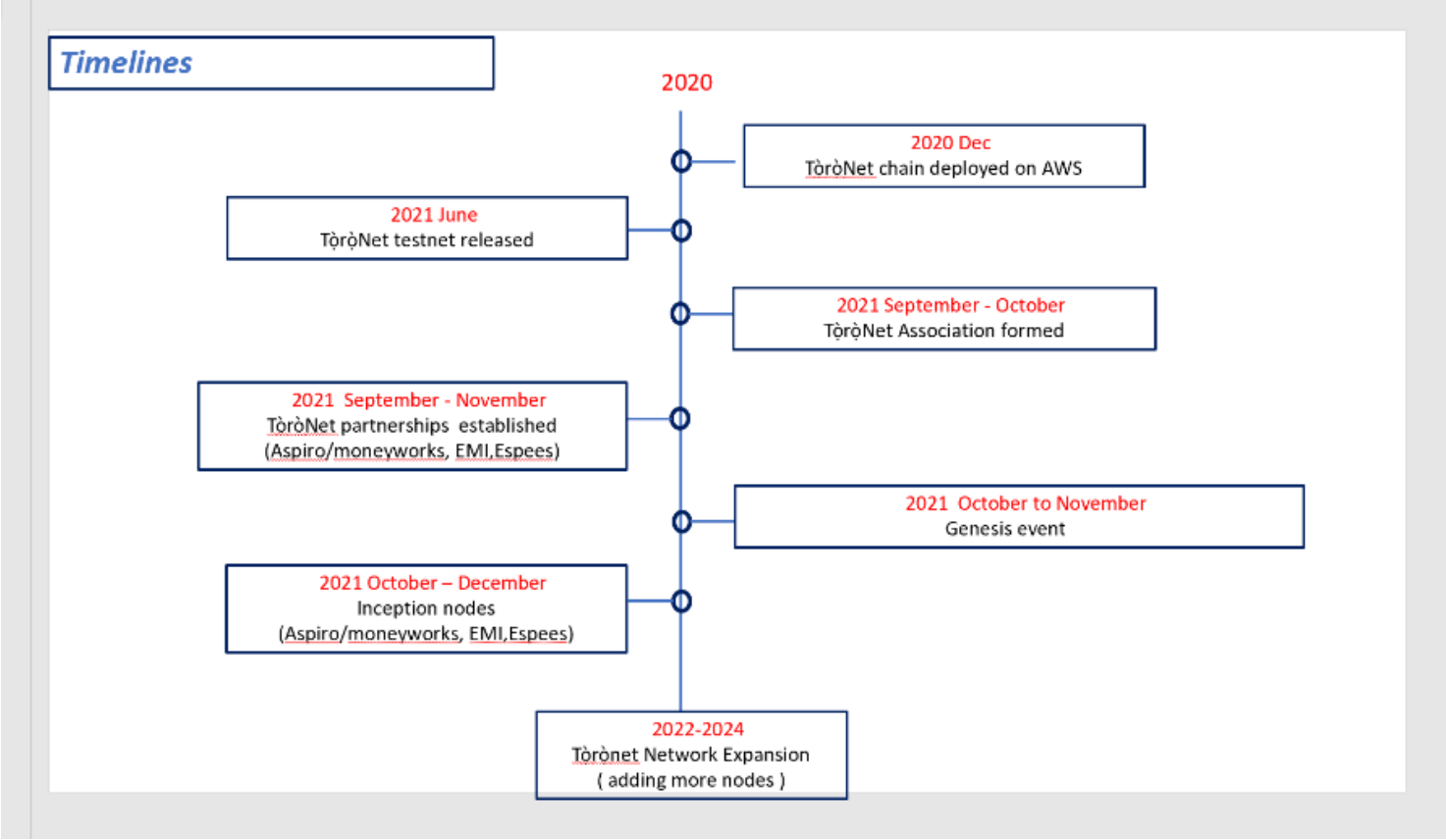
TòròNet Defi (TòròDefi) Implementation Design

This TọrọDefi form of funding takes the best of Defi/CF/TI and blends them into a new model of financing. The model distributes the risk of financing across a # of lenders whilst ensuring that ownership of the real world benefit does not accrues to the obligor until the loan is settled in a manner that ensures that utility of the assets by the obligor is not delayed.

## 1.5 Project Timelines

Some of the planned project milestones are presented below.

**Figure 1. Project Timelines**




## 1.6 Why TọrọNet and it's Use Cases

Decentralized Finance infrastructure is dominated by general purpose blockchains. A lot of apps that have nothing to do with finance are running on those chains thereby posing security, reliability, governance, standards, accountability, compliance, sustainability, cost and performance risks.

We have designed the Tòrò, the native token of Tòrònet chain as a utility token that Is designed to solve the financial inclusion problem. It does this by solving the underlying economic inclusion problem since only those who economic ability can be sustainably financially included.

To incentivize use cases that fulfil developmental aspirations in the Tòrònet ecosystem, we developed several smart contract framework, which we are making available to network members, as the infrastructure service provider, that demonstrate the capability of **The TòròNet** chain to achieve this goal. It does this by leveraging the capability of the chain to:

(I) Tokenize the demand for an asset (asking):

(I) Create a crypto- assets through a smart contact the demand for the asset by attaching the pre-order for the asset to a collateral request (CR) (hailing) for a fee. Use request for CR for direct asset financing or for use for borrowing at a financial institution.

(II) Offer the CRs on the network for sale (matching)

(III) Provide the asset via a merchant who is paid by the network (fulfilment)

(IV) Distribute the dividends of the transaction to everyone in the chain of value creation.

That is the power we have made available to developers

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# Part 2:
# The TọrọNet Infrastructure

Making the promise of a better future, enabled by blockchain infrastructure, a reality for millions.

## Yellow Paper

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## 2.0 Detailed Description of the TọrọNet Chain Infrastructure

The technical details of **the TọrọNet** blockchain implementation are discussed in this section.

These are described in this section.

### 2.1 The TọrọNet Blockchain Formulation

The TọrọNet blockchain is a ledger consisting of accounts and balances. The code base was initially set up from the Ethereum code, and then subsequently developed to add the desired features described in solution section, and replacing certain features including the fee system, and proof of work consensus algorithm. However, the network retains the smart contract language syntax, as well as the cryptographic and hashing function from the Ethereum network. The resulting technical formulation for this network is described in this section.

### 2.2 TọrọNet Consensus Process

The TọrọNet consensus process is a proof of authority consensus model and is a modification of proof of proof of work and proof of stake algorithms. In this process, only trusted participants are accepted in the network. Transaction processing nodes are all trusted and approved nodes with significant deposits or stake in the reserves. The POW difficulty algorithm is set so low such that any participant is able create blocks. However, the algorithm limits the total transaction value that can be mined by any node within a span of time (set to about two weeks) to be no greater than the value the node operator has invested in reserve (staked value.) Using this model, node operator can be trusted to produce blocks without requiring them to run expensive calculations and wasting electricity and computing resources. Their staked value provides the trust necessary for the blocks generated. The blocks do still have to be computed using a POW algorithm and are still chained to all prior blocks in history by cryptographic algorithm built into the blockchain.

As a result of these changes, the difficulty level required to create a block is set really low for the TọrọNet network, and blocks are created every 2 seconds. **Thus, it takes between 2 and 3 seconds to confirm a transaction on the TọrọNet blockchain.**

### 2.3 No Minting Rewards to Miners

Another key modification in the current definition compared with other blockchains, including the Ethereum blockchain is that the writing of a block does not result in minting of new value, or reward to the transaction processor, also known as the miner. So how are transactions paid for? Every transaction carries a transaction fee. The method of rewarding processing nodes with new mint, we feel is economically distortive. It might initially create an illusion of cheaper transaction costs, but that cost is simply taken from the system, and other users of the currency, in providing the rewards for growth in the system to transaction processors when actually the activity being performed is a service rather than a creative process.

## 2.4 Creative and Transformative Transactions

For simplicity, we identify two types of transactions in a theoretically isolated economic sub-domain. Those which transfer value among members of the ecosystem and those that result in completely new value that hitherto never existed in the system. In the TọrọNet eco-system the transactions that are creative and results in new mint include the following:

1. Deposit of fiat currency into the reserve. This results in the creation of an equivalent amount of Tọrọs at the current exchange rate.
2. Deposit of fiat currency into the reserve to create a collateral or to lend on the network.
3. Deposit of fiat currency or other cryptocurrency such as Ethereum that automatically results in minting of new Tọrọs of equivalent value.

# 3.0 Smart Contracts and Operations of the TọrọNet Chain

**TọrọNet** uses smart contracts to manage all assets on the blockchain. The tokens created on the blockchains are themselves created by smart contracts such that the fee structure is not on the blockchain layer and are thus part of the operational purview of the Association. This section describes these smart contracts including those used for setting up and operating savings, loan contracts, collateral contracts, as well as how the operational modus operandi is set up using game theory to create the offchain and onchain incentives to ensure contract fulfilment.

## 3.1 How the Native Tokens Tọrọ are created in the network

The following are the fundamental principles behind asset creation, tokens, and contracts on the network:

### Categories of assets and how they are Created on TọrọChain

Tọrọs are created in the following ways:

1. Anyone can deposit equivalent fiat in offchain reserves or cryptocurrency into Tọrọ cryptocurrency reserve, and have equivalent stablecoin of the same value created on the Tọrọ blockchain.
2. Stablecoins can be converted to Tọrọs .
3. Smart contract derivative Tọrọs are created and can convert to Tọrọs
4. Assets that are secured by the blockchain are tokenized . These are non-fungible tokens (NFTs).
5. Tokenized collaterals or virtual assets can be created from values deposited into the reserves or staked Tọrọs.

## 3.2 Fiat-to-Chain and Cross-chain Mechanism

TọrọNet uses tokens to bring in external tokens to TọrọNet in a trustless manner and allow trustless financial contracts and trading of all major cryptoasset tokens.

The token standards are similar to ERC20 on Ethereum and Omni on Bitcoin blockchain. Through this standard, TọrọNetChain allows tokenization of any asset including fiat currencies and cryptocurrencies.

All tokens created on the network are asset-backed tokens created with the backing of cryptoassets or fiat currencies. For instance, if a user on the network deposits USD 100 in the system, the amount is

placed in the TọrọNet offchain reserve, and an equivalent amount in stablecoin USD is credited to the user's account on the blockchain. Further, if the user deposits the stablecoin USD in blockchain reserve, an equivalent amount in Tọrọs is minted and deposited in the user's account on the blockchain. The rate of conversion between the stablecoins and the native Tọrọs are set by oracles maintained by the network utilizing several public exchange rate benchmarks. The rates as set such that tokenizing an asset on the blockchain is usually 1:1.

## 3.3 Savings Contract in the TọrọNet Ecosystem

A monetary ecosystem is incomplete without a savings strategy within the system. Savers provide liquidity within the system for enterprising entities; in this case users seeking to purchase assets such as smartphones, vehicles, houses, or even farmers seeking development loans.

The system would need to provide some incentive for savings. This does require some balance as well. A system where savings are  too incentivized typically results in one where many hold and do not spend their resources and the economic system does not grow.

Several blockchains have introduced the concept of savings by allowing account owners to stake (lock) balances in their wallet for some length of time in exchange for some of the new mining rewards. An example is the Dash network.[9] And some blockchains are almost completely investment mechanisms because they are so deflationary that their value keeps rising and significant enterprise or spending as a ratio of the circulation remains low; for example, bitcoins.

In TọrọNet, we introduce a completely new way of accommodating those who wish to save their assets while incentivizing them to do so. The savings is discounted off the reserve such that the association, the administrative node has room off the reserve to make loans or microloans to users in the ecosystem via network members that results in growth to the reserve on repayment with interest.

To accomplish this, we designed a contract asset, TọrọSV, which has the same conversion rate and value as Tọrọs. However, bearers of this asset receive back a proportion of the overall growth of the reserve. If the reserves do not grow, they have no reward. To convert a Tọrọs to TọrọSV, a user simply needs to send their Tọrọs to the reserve and an equivalent amount of TọrọSV is deposited into their account.

## 3.4 Loan Contract

Loan Contract is designed to allow the owner of the contract to take a collateralized loan against collateral locked in the contract. Each loan contract is unique to every owner (address) on TọrọNetChain.

Any user can open a loan contract on TọrọNetChain. The user who opens a loan contract owns the specific contract. This ownership, however, is transferable.

Once a loan contract is opened, it may be funded with Tọrọs or any stablecoin on the blockchain. Once a loan contract is funded, it allows the owner to take out a loan by minting derivative loan Tọrọs. (It should be noted that the loaner's funds could come from a combination of traded collaterals. This process is described in Section 3.5.) It should be noted that in this and other cases, the Tòrònet association and the network in general provides this smart contract templates as an infrastructure.

Independent nodes on the platform are expected to utilize these smart contracts to develop these into services in the various communities using the network.

## 3.5 Tradeable Collateral Contracts

**TọrọNet** also introduces tradeable collaterals in a smart contract template expected to be utilized by nodes in the ecosystem. This is a new concept brought to the blockchain space on the realization that a lot of times liquidity can frequently exist in different geographical locations by country. In such situations, owners of such resources would like to benefit from returns that could accrue from putting such resources to work in form of making loans in the locations where they are needed. However, there currently exists no procedure to allow this to occur without risking those resources due to lack of an ability to perform due diligence on borrowers or monitor performance or enforce the terms of the loans.

A tradeable collateral contract allows the resource to be collaterized on the blockchain in its own jurisdiction, and the power of the collateral traded to a member of the blockchain in the local jurisdiction, who has the local knowledge, access, and proximity to borrowers and able to process such loans. The eventual tradeable contract is structured such that the operator has no means of monetizing the collateral besides the successful performance of the loans, and is incentivized to receive rewards only on performance. The operator also is required to stake other resources to guarantee the loan activity. Finally, the local collateral on the loan is still retained in the form of tokenized asset as described in Section 3.5 – including deeds, auto, or smart phone registration to which the blockchain Association retains rights until the terms of the loans are satisfied.

### *3.5.1 Bundling of Collaterals*

Traded collaterals are typically expected to be bundled in a composite such that a collateral exposure is not to one loan, but is secured by several loan contracts. The reverse is also the case. This is illustrated in Figure 1. This is a risk management feature built into the collaterals and loans contract.

### *3.5.2 Security for Lender, Borrower, and Tòrònet*

The TọrọNet platform Defi formulation utilizes the advantages of blockchain smart contracts to manage a loan and enforce loan terms. Unlike most DEFI projects, Toronet loan collaterals are expected to be used for real world items such as mortgaged homes, car loans, and loans for smart phones, which facilitate business opportunities. The loans payments are made directly to an operator or dealer by utilizing a special type of Tọrọs provided to the borrower. The special Tọrọs can only be cashed by such dealers. Secondly, the dealer who is also a user registered to that role on the blockchain is required to register in the real world to the node. This is critical since the node is the actual entity providing the funds guarantee from it's reserves.

Similar to crowd funding structure, multiple funding sources can be aggregated using a system of tradeable collaterals. In the event of a default on the blockchain, in the real world the dealer is then able

to reclaim the collateral. The dealer rewards are built into the smart contract. Similar to secured loans on real world assets in traditional finance, insurance is required for items that are secured by loans throughout the duration of the loans; to ensure that the no significant part of off-chain operations resolves into debt collection activities. The loan administration cost for this arrangement is the rewards allocated to dealers and the insurance cost of the secured items, and is expected to be lower than for traditional finance. However, it is expected that nodes on TọrọNet platform will also still able to make blockchain loans to real people in communities with real finance needs.

## 3.7 Transparency of the Reserve

The balances of all currencies in the reserve will be published on the TọrọNet public blockchain website or explorer. The values in the reserve will be maintained in reputable banking institution so that it would be verifiable that indeed the issued currencies are backed by the reserves that are intended to cover their liquidity. It should be noted, that it is implied, and expected that the Administrative nodes could withdraw to cover operational costs of running the network from the reserves up to the reserve margin. All such withdrawals will also be on the blockchain and can be viewed publicly.

## 3.8 Decentralized Exchange (DEX)

The TọrọNet ecosystem includes a decentralized exchange within the network. Several assets can be traded or exchanged for each other based on the exchange rate determined by oracles within the blockchain. The exchange allows trading (exchange) of several assets including fiat currencies in operating communities, Tọrọs, derived Tọrọs, and several cryptocurrencies including Bitcoin and Ethereum.

**Table 1. Exchange Rates for Different Types of Asset Exchanges on the Network**

| Asset | Exchange Type | StableCoin of Fiat | Exchange Rate |
|---|---|---|---|
| Local Fiat Currency eg. Cedi, Naira, Kenyan Shillings, etc. | Fiat Currency to Stablecoin Fiat Token on Blockchain | Tokenized Local Currency or Stablecoin | 1.1:1 conversion to stablecoin |
| Stablecoin or Tokenized Local Fiat Currency | Stablecoin Fiat Token back to Fiat Currency for Withdrawal | Local Fiat Currency | 2. 1: (1 - *x*)<br>*x* is a small margin such as 0.02 |
| Stablecoin | Stablecoin to Tọrọ | Tọrọ | 3. Rate set by Blockchain oracle |
| Cryptocurrency eg. Bitcoin, Ethereum | Cryptocurrency to Tokenized Cryptocurrency | Tokenized Cryptocurrency | 4.1:1 conversion to tokenized cryptocurrency |
| Tokenized Cryptocurrency | Tokenized Cryptocurrency to Cryptocurrency | Cryptocurrency eg. Bitcoin, Ethereum | 5. 1: (1 - *x*)<br>*x* is a small margin such as 0.02 |

| | | | |
|---|---|---|---|
| Derived Stablecoin | Derived stablecoin to Stablecoin | Stablecoin | 6. 1: $(1 - y)$<br>$y$ is a small margin such as 0.0 |
| Stablecoin | Stablecoin to Derived Stablecoin | Stablecoin | 7. 1:1 |

TǫrǫNet will support local currencies in each jurisdiction of operation (Figure 1.) as well as cryptocurrencies. At the start, Bitcoin and Ethereum will likely be supported. Other cryptocurrencies may be added later as decided by the Association. Each supported asset will have its own reserve account to maintain backing for the tokenized asset on the blockchain. The balance of each reserve will be transparent and verifiable on the blockchain as shown in Figure 1.

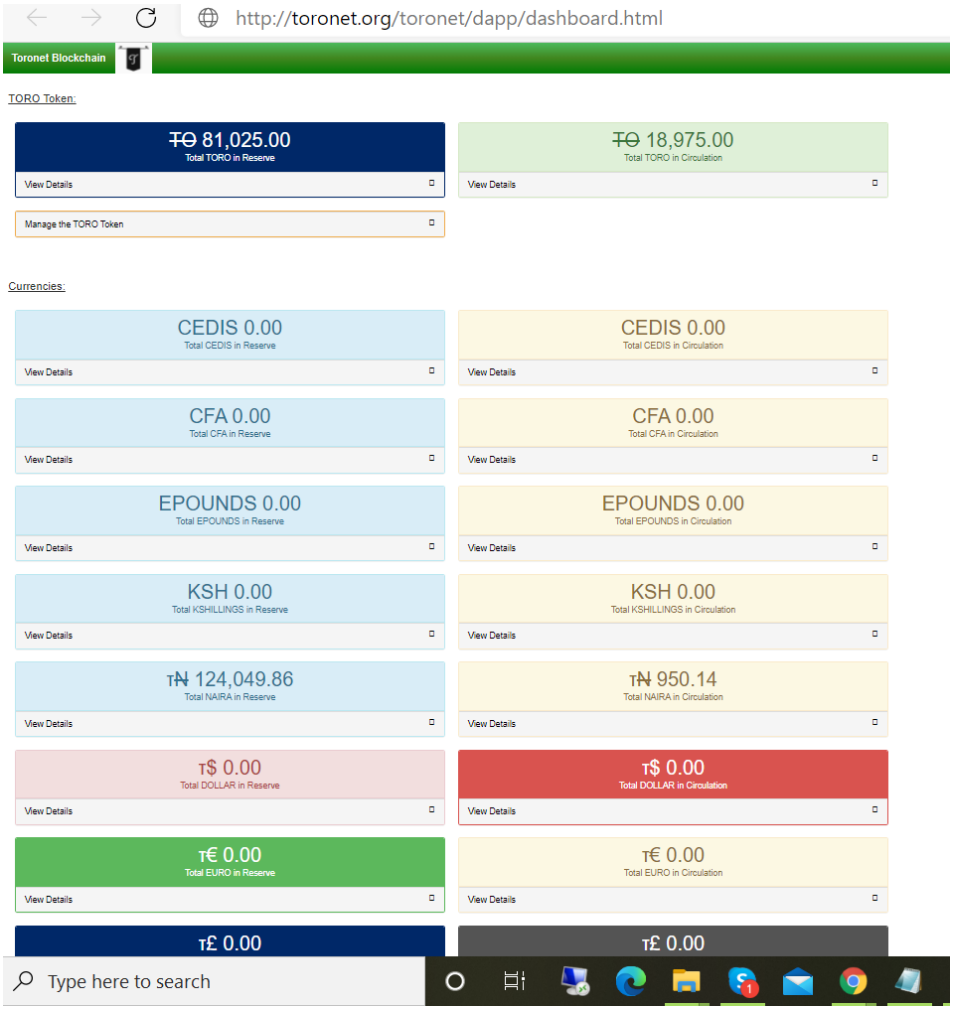


**Figure 1. Multi-Asset Formulation of TǫrǫBlockchain**

## 3.9 Support for Derivative Tokens

The TọrọNet blockchain includes derivative version of stable coins. These are tokens on the blockchain minted and backed by equivalent stable coin tokens coded programmatically on the blockchain to accomplish some contractual objectives. This allows developers to create their own tokens as derivatives of Toro.

There are several types of derived stable coins currently programmed in smart contracts on the blockchain, including:

1. Derived Stablecoins That Function Similar to a Escrow Payment

   An example of this is a contract for delivery of a physical asset. Such a contract may be funded by the buyer. The blockchain can then lock the funding in the contract and create a derivative equivalent in the same currency. The derivative stablecoin could then be paid to a delivery agent contingent on the ability of the delivery agent to "cash" the derivative or convert it back to the stablecoin on verification of delivery. The physical asset delivery contracts developed on the blockchain functions in this manner. Unlike a traditional escrow they do not require a third-party to initiate the release or conversion of the stablecoin as the conditions are coded directly in the contract and enforced by the blockchain.

2. Derived Stablecoins that Enforce Conditions of a Contract

   An example of this is a contract that issues a loan to purchase an auto vehicle. Such a contract may be funded by the loaner. The funding is retained in reserve while an equivalent stablecoin of the same value is generated. The derived stablecoin could be programmatically coded by the smart contract to only be convertible back to the underlying stablecoin by a user on the blockchain designated as an auto dealer. The derived stablecoin can then be provided to the borrower, who can only utilize the derived stablecoin to purchase an auto vehicle, by virtue of the instructions carried within the stablecoin asset's program. An example of this type of derived stablecoin is depicted in Figure 3.

3. Derived Stablecoins Programmed with Time Release

   Similar to the first two types of derived stablecoins, this version can only be converted to the underlying stablecoin maintained by the reserve under some condition. In this case, the condition is some time interval programmed by the contract and encoded within the derived token.

Other types of derived stablecoins may be constructed as new template contracts for real world finance and commerce are addressed on TọrọNetChain. Note that some of the derivative stable coins are expected to be transferrable or not depending on the terms of the contract as agreed upon by both parties. In all cases, the principle and goal is for peer-to-peer agreements enforced and managed by the blockchain such that third

party entities are not required to enable commerce or financial transactions between pertinent entities. This reduces costs, increases trusts, reduces risks, and potential default of contract terms.

## 3.10 Support for Non-Fungible Tokens

TǫrǫNet supports the ERC721 non-fungible token (NFT) standard. This standard was developed to define non-fungible tokens (NFTs) or more simply unique digital items. Similar to ERC20, adhering to this standard allows a uniform interpretation of unique asset tokens on devices and applications, regardless of the blockchain they are built on. The standard has since spawned growth in NFTs in 2021. Besides its use for tokenizing digital art, the application of this standard is currently leading growth of NFTs in the gaming industry and leading the pay-to-earn games phenomenon. Beyond securing digital art, this standard is also being used by nodes on the TǫrǫNet network to tokenize real-world items for buy now pay later BNL loans for items such as phones, using unique details such as their MEIs, auto-vehicles by their VIN and attributes.

## 3.11 Multi-Role Blockchain System

The TǫrǫNet blockchain by virtue of the type of smart contracts it fundamentally supports is designed to be a multi-role blockchain. This is distinct from virtually any other blockchain, but is necessary to make the blockchain useful in addressing the real financial and commercial needs of the communities it addresses. For instance, on the Bitcoin or Ethereum blockchain, all users of the blockchain have the same role and privileges on the blockchain.

On TǫrǫNet, all users start off with the same fundamental access. This includes an account, an ability to deposit funds, create stablecoin of equal value to fiat or crypto assets they deposit, transfer assets (make payments) to any other user on the network. However, to participate in some smart contract activities, several roles are created by the contracts, and users may apply to, or be assigned to those roles according to the terms of the contract. These roles provides the users access to features of different contracts to enable the terms of the contracts.

Currently, the blockchain includes the following default roles:

| | |
|---|---|
| 1. Operators | 2. Loan Originators |
| 3. Smart Phone Dealers | 4. Auto Dealers |
| 5. Mortgage Agents | 6. Real Estate Appraisers |
| 7. Agro-Dealers | 8. Agricultural Produce Offtakers |
| 9. Agricultural Produce Certifiers | 10. Insurers |
| 11. Farmers | 12. Village Aggregators |

A framework to create other roles is built into the network to accommodate other roles in future as more finance and commerce contracts are included.

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## The TọrọNet Association

Making the promise of a better future, enabled by blockchain infrastructure, a reality for millions.

## Green Paper

# Table of Contents

## 4.1 Governance Structure

The **TọrọNet** project a public decentralized blockchain governed by a Switzerland based association.

There are 2 dimensions to the governance of the project. The legal entity which is the non-commercial &not-for-profit association and the Distributed Autonomous Organization (DAO) which comprises of the network members.

### Generation & distribution Initial Governing Toros to govern the DAO

When the network is started. 35million Governance Tokens are minted, and they will be distributed to the following categories:

- Vision bearers – 10%
- TòròNet development sponsors – 20%
- TòròNet Team -20%
- TòròNet Network members, the nodes – 20%
- TòròNet Association – 5%
- TòròNet Community – 25%

Considerations regarding this approach are the following:

1. Equity/ Representation/ balance of power , which relates t ensuring that every stakeholder has a voice
2. Access, which relates to limiting supply
3. vision integrity, which relates to how we ensure the network does not stray.

### Function of the Governance Tokens

The governance tokens will be utility tokens required for performing certain activities on the network. This will include:

- Participating in governing the network by using the governing tokens to vote on proposal put forward to vote by the Association.
- To protect the quality of projects developed on the network, generating smart contracts are only open to node members, and require governance tokens to be consumed to compile and deploy smart contracts on the network.

### Node Admittance Rules

The **TọrọNet**Chain Association requires a one-time member fee to be paid by each node. This membership fee will be USD 1,000,000 per member. The fees are deposited in off-chain reserve and it triggers on the smart contract an equivalent value in Tọrọs to be created on the blockchain for each member. Upon joining, each node gets 500k governance tokens which enables them to vote on governing proposals and parameters of the system.

### Proposed Disbursement of Reserve Gains

The operational principles of the network, economic activity on the blockchain results in gradual increase in value of the reserve. Some of the gains in the reserve is returned to all holders of Tọ̀rọ̀s by applying the gains to the exchange rates in Figure 1, such that Tọ̀rọ̀s convert to more of each stablecoin with each epoch. At the outset, the following will be the ratios for allocating gains in the reserves:

- 10% allocated to code maintenance
- 20% to the Association development fund to provide grants and loans for projects and initiatives in the community the further the objective of the Association to assist in the growth of communities served by the network.
- 10% to fund Association Operations &
- 60% distributed to holders of the governance tokens.

# 5.0 Association Operations and Marketing

## 5.1 Target Market

The target market for TǫrǫNet is predominantly emerging economies that are underserved by traditional banking and finance structures or access to finance. However, we expect that commerce and finance will ultimately prove to be advantageous on TǫrǫNet such that it may also attract those with easy access to traditional financial institutions and even other DEFI blockchains. In addition to some of the features built into TǫrǫNet to address commerce and financial needs of emerging economies, the network can also be used for regular commerce, payment system, remittances, and even as an exchange by almost any user anywhere. Regardless of this reality, the approach to bringing awareness to the network will focus on developing economies. This approach will include the following activities:

- Engage and Sign-up Local Champions or nodes in countries
- Set up Last Mile Structures and partners.
- Build strong relations on behalf of the network with at the global level whilst knowing that in-country node-operators sign up
- Utilize social media and traditional media to advertise the features of TǫrǫNetChain that will benefit members of the community.
- Engage Local Authorities and Encourage and Approve Association Membership to Key Organizations in each Jurisdiction.

## 5 Partnerships

The TǫrǫNetChain association will focus on establishing partnerships within within the technology field.

The activities and focus in the technology field will be as follows:

- Ensuring that TǫrǫNet is submitted and reflected on the major technical project listings and exchanges. The submission procedure can be slightly technical and each entity has different formats. TǫrǫNet has members with experience in navigating and completing such listings.
- Assisting public exchanges in integrating and listing our tokens.
- Liasing with the local stock exchanges to list TǫrǫNet offerings in line with our focus of not simply becoming a blockchain-centric entity but a real world and complete financial solutions organization.

To reach the Association, please email: info@toronet.org

# A Glimpse into the Future

Building on top of TǫrǫNetChain will lead to some of the most exciting benefits not only for first-world areas, but moreover also all those that need decentralized finance the most. For example, imagine Anna, who owns a small business in a developing economy, but who doesn't have a traditional bank account. She uses mobile money and digital currencies to run her business, accepting payments through mobile–which makes perfect sense, because nobody in her province uses cash or credit cards. Anna uses

TọrọNetChain to take out a loan when one of her suppliers pays late, saving her business. In the old days, she would have simply gone out of business, because no bank would loan money to her. Anna also invests wisely. When she is paid by the supplier, she immediately moves the cash into various tokenized assets to avoid the hyperinflation and instability of her national government's currency, and on top of that, she is able to earn interest.

Anna creates a group of local businesspeople, and together they pool funds to help other entrepreneurs in their village. They purchase office space, solar panels, and a satellite to create a business-centr. The group uses TọrọNet to eliminate the overhead of complex legal contracts between them. They receive automatic dividends when the business centr profits. Some of them reinvest in a delivery drone which charges for its services, and distributes the income to the investors. Others invest in sensor equipment that test local soil conditions, and sell the data to commodity markets. All of the sensors work independently and charge independently, and the investors simply reap the profits, all calculated automatically on TọrọNetChain.

Now, 5 years after her initial use of TọrọNet, Anna is able to take out a loan with no collateral, based on her long-term record of smart investments and returning loans on time, as well as assessment of her industry from trusted oracles. It's a win-win situation. The lenders come from all over the globe, from people who want to diversify their investment portfolio to developing economies. The lenders don't have to worry about the complexity of cross-border transactions or legal requirements. They escape the banking systems of their own countries, which moved to zero and negative-interest rates on savings. Now, these regular investors can be assured of returns on investments based on Anna and people like her, who run great businesses and can provide returns on people's investments.

**This is what TọrọNetChain is all about - to make the world a better place!**

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