

## Development of a Blockchain Ecosystem Based on the Tokenization of Food Waste

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### Abstract

The coexistence of food waste and food insecurity is a paradox of modern times, especially in the urban environment. In this context, the core objective of the project presented in this paper is to develop a decentralized application (dApp) running on mobile devices, for reducing food waste by providing safe and nutritious meals, mainly to food insecure citizens. There are two basic user profiles of the BLOCKFOODWASTE system, the Food Service Establishments (FSEs) and the citizens. FSEs are the suppliers of the system's core product i.e., food surplus, and the citizens are the consumers that purchase these meals using the project's tokens. Tokenization is the process of converting assets into digital tokens on a blockchain and in the context of the presented project is used to track and incentivize the reduction of food waste. The asset represented by the digital token is the food surplus available to the ecosystem by the FSEs. Each citizen, upon registration, is granted an initial number of tokens to spend and acquiring more tokens is possible by collecting meals from the suppliers. The project's token is created using a smart contract that outlines the terms and conditions of the token, such as its value, ownership, and transferability. The smart contract automatically executes the terms of an agreement between both parties and is used to manage the allocation, transfer, and redemption of tokens issued to FSEs and citizens, based on their food waste reduction participation. The contract will be monitored by all parties on a public blockchain, providing a secure and transparent way to manage the process, allowing for widespread adoption and participation in reducing food waste. Every participating establishment receives a certain number of tokens in exchange for every portion of food saved from going to waste. FSEs can redeem their tokens for access to data analytics and other incentives from the community, or donate the tokens to food insecure citizens. On the other hand, citizens use the tokens as a currency to purchase food surplus or other products from participating business entities. This incentivizes users to participate in food waste reduction and aligns their interests with the goals of the project. The tokens are managed using a blockchain wallet, integrated into the mobile app to provide customers and restaurants with a secure and convenient way to manage their tokens and track food waste reduction. The blockchain can also enforce rules and conditions for token transfer, such as minimum food waste reduction goals, to ensure that the tokens are used effectively. The logic of the proposed blockchain ecosystem, considers parameters such as, supply, distribution, utility and economics of the token, along with network effects and market demand. Based on these parameters and with the utilization of financial modeling and market analysis tools, the authors will estimate the potential value of the token and the overall tokenomics of the BLOCKFOODWASTE application.

**Keywords:** Food waste, Food insecurity Blockchain, Tokenization, Smart contracts

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