Droplet

Tokenizing Utah Water Rights on the Ethereum Network

Problem

UT is one of the driest states in the nation, and is susceptible to drought.

75% of Utah's water goes to agricultural users, which may be an overallocation. An efficient water rights market could better reallocate water to municipal users and conservation organizations.

The legal framework for transferring water rights and incentivizing water conservation is complex, opaque, and inefficient

Utah Water Rights Background

- The Division of Water Rights is the Utah governing agency in charge of the allocation of water rights. They have 6 regional offices.
- They are the agency who would need to distribute Droplet coins to water right owners.
- There is no centralized market for water rights in Utah; the majority of transactions happen privately between individuals.
- Extra paperwork needs to be done if the water right needs to change source or use.
- Use it or lose it: If a water right goes unused/partially unused for 7 years, it or the unused portion is subject to forfeiture.
- No annual fees for water rights, just the application cost and market purchase cost

Solution

Create a **DePin token** on the Ethereum Blockchain tied to water right

Place **IoT's** at water diversion and pump sites

Provides transparency, speed, security, and incentives

IoT's and smart contracts

- Establishing beneficial use of water manual reporting and inspections is currently needed.
- IoT sensors placed at diversion points could automatically upload usage data to the Remix Smart Contract.
- Smart contracts could automate compliance verification, fund transfers and ownership changes.
- Storing ownership records on the blockchain would be more secure and speed up the ownership verification process.
- First TestNet trial run in the Columbia River Basin.

How it Works

1. **DWR issues tokens to water rights holders.**
   a. Tokens are assigned based on market value of the water right.
   b. Water rights holders would need to download a MetaMask wallet.
2. **Water right holders can then exchange water right tokens to other people in exchange for USDC.**
   a. They can then cash out USDC, or use it to buy tokens in the future.
   b. This allows them to "sub-lease" the water they don't need.
3. **IoT water sensors are placed at diversion points to monitor water usage, updating Remix smart contract instantly.**
   a. This eliminates need for manual DWR reporting and inspection of beneficial use (enforcing use it or lose it policy).
4. **Ethereum blockchain keeps a record of water right ownership**
   a. **A**llows for quick owner verification.
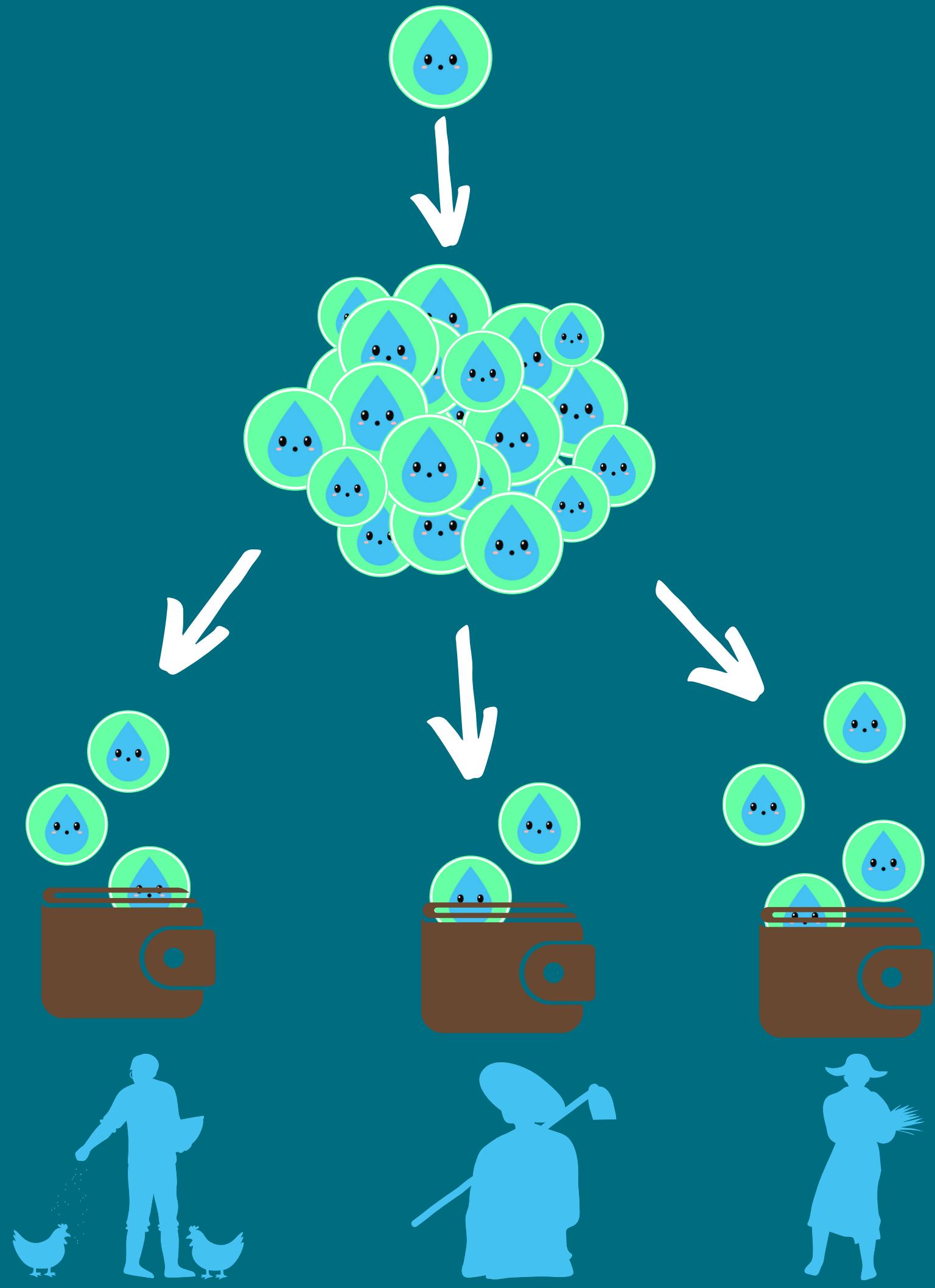
Meet Droplet (DRP)

0x0e77751E3B411Ae55a8B4b108D8d0365DB2F1b9C

Smart Process

- Deploy Smart contract on Remix on the Sepolia Ethereum Testnet
- Mint 1M tokens for Droplet (DRP)
- Verify and Publish Contract on Etherscan
- Distribute tokens using Metamask Wallets

```
1   // SPDX-License-Identifier: MIT
2   pragma solidity ^0.8.0;
3
4   import "@openzeppelin/contracts/token/ERC20/ERC20.sol";
5
6   contract WaterRightsToken is ERC20 {
7       constructor() ERC20("Droplet", "DRP") {   📄 infinite gas 710800 gas
8           _mint(msg.sender, 1000000 * 10 ** decimals()); // Mint 1M tokens
9       }
```

Token Droplet (DRP)

`ERC-20`

Overview

MAX TOTAL SUPPLY
1,000,000 DRP

HOLDERS
1

TOTAL TRANSFERS
1

Market

ONCHAIN MARKET CAP ⓘ
$0.00

CIRCULATING SUPPLY MARKET CAP
-

Other Info
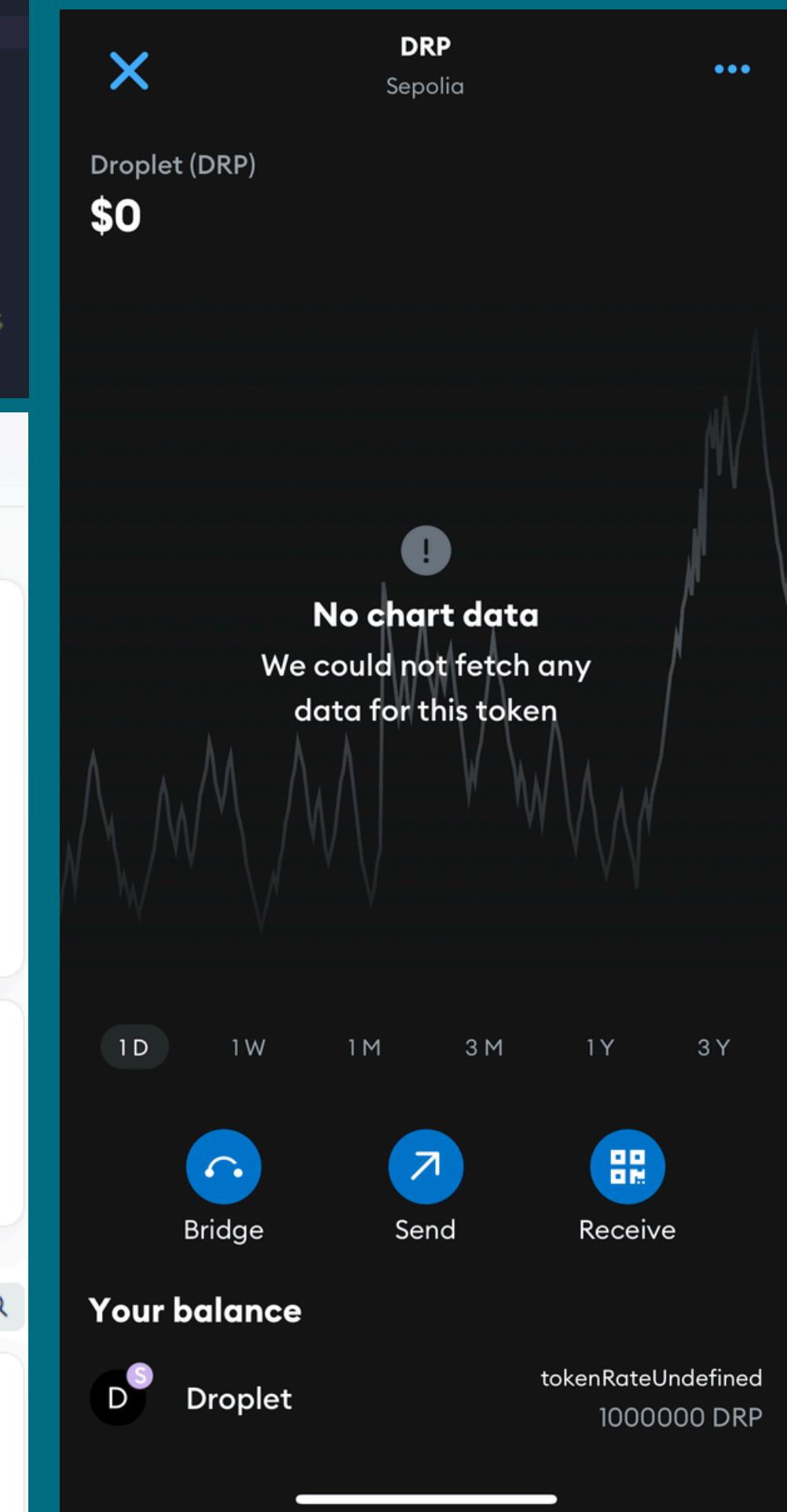
TOKEN CONTRACT (WITH 18 DECIMALS)
📄 0x0e77751E3B411Ae55a8B4b108D8d0365DB2F1b9C ⧉

Transfers | Holders | Contract

⇅ A total of 1 transaction found   ⬇ Download Page Data | First | ‹ | Page 1 of 1 | › | Last

	Transaction Hash	Method ⓘ	Block	Age	From		To	
👁	0xbee9f7f239a... ⧉	0x60806040	7808722	9 hrs ago	0x00000000...000000000 ⧉	→	0x583601dB...Bc02D6006	⧉

DRP
Sepolia

✕   ⋯

Droplet (DRP)
$0

⚠
No chart data
We could not fetch any
data for this token

1 D | 1 W | 1 M | 3 M | 1 Y | 3 Y

Bridge | Send | Receive

Your balance

Droplet   tokenRateUndefined
                           1000000 DRP

Future Steps

On TestNet now, if successful deploy in more places gradually to ensure system is working

- List on a Decentralized Exchange- Uniswap
  - User friendly & maximizes exposure & liquidity
- Provide Liquidity
  - Pair DRP with USDC
    - Stability & easier to interpret
      - 1 DRP Token = $1 worth of ETH or USDC
- People Can Buy/Sell DRP
  - Once the pool is live, people can swap USDC for Droplet, determining its market price

To Do

- Determining market price of water
  - Auctions- dynamic pricing
  - Price Evaluation- price cap
  - Not guaranteed water, only percentage of water
- How to introduce this
  - Make new standard and grandfather in
  - Take it region by region
- Owning vs renting difference
  - Fractional NFT for ownership, tokens for trading?
  - Derivatives secondary contract
- Implementing sensors
  - Costs of sensors
  - IOT updating smart contract, automatically burning tokens- and distributing tokens

Terms

- DePIN Token: A digital asset representing ownership or access rights to a decentralized physical infrastructure network (DePIN).

- Ethereum Blockchain: A decentralized platform that supports smart contracts and token creation, providing a secure foundation for DePIN tokens.

- Smart Contract: A self-executing contract with the terms of the agreement directly written into code, governing the creation and transfer of DePIN tokens.

- Coin: A cryptocurrency that operates on its own blockchain (e.g., Bitcoin, Ethereum).

- Wallet: A software application that allows users to store, send, and receive cryptocurrencies or tokens, including DePIN tokens.

Terms

- Water Rights: Right to divert and use public water.
- IOT water sensor: "Internet of things" sensor device that can monitor water flow rate and more, and transmit this data in real-time to a central system using internet.
- Division of Water rights: state agency in charge of the appropriation and distribution of water.
- Acre-ft: One acre-foot is the amount of water needed to cover one acre of land to a depth of one foot. Measure of water volume.
- CFS - Cubic feet per second. This is a measure of flow rate. Equivalent to about 450 gallons of water flowing per minute.
- Diversion point: The point where water is removed from its natural source to be used under a water right.

End

Sources

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- Kira Green- River Expert
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