

The Green World Campaign (GWC) is a non-profit organization that works towards regenerating degraded land and promoting sustainable agriculture practices. GWC has partnered with Chainlink, a decentralized oracle network that provides tamper-proof inputs and outputs for smart contracts on blockchain platforms. By using Chainlink's oracle network, GWC can access real-time, high-quality data from satellite remote sensing systems, which can then be used to create hybrid smart contracts.

Hybrid smart contracts are smart contracts that combine on-chain code with off-chain, real-world data from IoT sensors and satellite data to create a more secure and efficient system. Hybrid smart contracts are well suited for applications that require real-world data, such as agriculture and environmental monitoring.

The process of using hybrid smart contracts for the GWC reward system involves several steps:

1. **Data Collection:** The first step involves collecting data from satellite remote sensing systems and IoT sensors. The data collected may include information on soil moisture, vegetation cover, rainfall patterns, and other relevant parameters that can be used to evaluate the performance of regenerative agriculture practices.
2. **Data Feeds:** The data collected is then fed into the Chainlink oracle network, which acts as a bridge between the off-chain data and the on-chain smart contract. The oracle network ensures that the data is tamper-proof and secure.
3. **Smart Contract Execution:** The smart contract is programmed to execute specific actions based on the data fed into the oracle network. For example, if the data indicates that a farmer has successfully implemented regenerative agriculture practices, the smart contract can automatically reward the farmer with a predetermined amount of cryptocurrency or other incentives.
4. **Rewards Distribution:** The rewards are then distributed to the farmers or stewards who have successfully implemented regenerative agriculture practices. The rewards may be in the form of cryptocurrency or other incentives such as access to training programs, equipment, or marketing opportunities.

The use of hybrid smart contracts in the GWC reward system provides several benefits. Firstly, it ensures that the data used to evaluate the performance of regenerative agriculture practices is accurate, tamper-proof, and secure. Secondly, it eliminates the need for intermediaries such as banks or government agencies, which can reduce costs and increase efficiency. Finally, it provides an incentive for farmers and stewards to implement sustainable agriculture practices, which can have a positive impact on the environment and local communities.

In conclusion, the use of satellite remote sensing data fed through Chainlink oracles to reward stewards of regenerative agriculture is an innovative application of blockchain technology. Hybrid smart contracts combine on-chain code and real-world data to create a secure and efficient system for incentivizing sustainable agriculture practices

The data collection process behind using hybrid smart contracts for the GWC reward system is as follows :-

Identification of Relevant Data Sources: The first step in the data collection process is to identify relevant data sources that can provide information on the performance of regenerative agriculture practices. These data sources may include satellite remote sensing systems, IoT sensors, and other relevant sources.

2. **Data Acquisition:** Once relevant data sources have been identified, the next step is to acquire the data. For satellite remote sensing systems, this may involve purchasing data from commercial providers or accessing publicly available data from sources such as NASA or the European Space Agency. For IoT sensors, data may be collected using wireless sensors that are installed on the farm.
3. **Data Pre-processing:** Raw data collected from various sources is usually noisy and requires pre-processing to remove any irrelevant or erroneous information. This may involve data cleaning, normalization, and scaling to ensure that the data is in a standardized format.
4. **Data Integration:** After pre-processing, the data from different sources is integrated into a single data repository. This step involves aligning the data from different sources to ensure that they are synchronized and can be used together.
5. **Data Analysis:** The integrated data is then analyzed to derive meaningful insights that can be used to evaluate the performance of regenerative agriculture practices. This may involve applying statistical methods such as regression analysis, machine learning algorithms, or other analytical techniques.
6. **Data Feed Creation:** Once the data has been analyzed, a data feed is created. The data feed is a real-time stream of data that provides up-to-date information on the performance of regenerative agriculture practices. This data feed is used to trigger the hybrid smart contract.
7. **Oracle Integration:** The data feed is then integrated into the Chainlink oracle network. The oracle network ensures that the data feed is tamper-proof and secure, and can be used as an input to the hybrid smart contract.
8. **Hybrid Smart Contract Execution:** The hybrid smart contract is programmed to execute specific actions based on the data feed from the Chainlink oracle network. For example, if the data feed indicates that a farmer has successfully implemented regenerative agriculture practices, the smart contract can automatically reward the farmer with a predetermined amount of cryptocurrency or other incentives.

9. Rewards Distribution: The rewards are then distributed to the farmers or stewards who have successfully implemented regenerative agriculture practices. The rewards may be in the form of cryptocurrency or other incentives such as access to training programs, equipment, or marketing opportunities

In conclusion, the data collection process for using hybrid smart contracts in the GWC reward system involves identifying relevant data sources, acquiring and pre-processing the data, integrating the data, analyzing the data to derive insights, creating a data feed, integrating the data feed into the Chainlink oracle network, executing the hybrid smart contract, and distributing rewards to farmers or stewards who have successfully implemented regenerative agriculture practices.

And here's how data is preprocessed in the entire data collection process that use hybrid smart contract for GWC Reward system

In the data collection process that uses hybrid smart contracts for the GWC Reward system, the data pre-processing stage involves several steps to clean and standardize the data. These steps are outlined below:

1. Data Cleaning: The first step in the pre-processing stage is to remove any irrelevant or inaccurate data points from the raw data. This may involve removing duplicates, correcting errors, and filling in missing data points using interpolation or other methods.
2. Data Normalization: After cleaning the data, the next step is to normalize the data to ensure that it is on a consistent scale. Normalization involves scaling the data to a range of values between 0 and 1 or -1 and 1. This is done to avoid bias towards any specific feature or attribute of the data.
3. Data Scaling: The final step in the pre-processing stage is to scale the data to ensure that it is consistent across all data sources. This may involve adjusting the data to a common measurement unit, such as converting values from different units of measurement to a standard unit.

The pre-processed data is then integrated into a single data repository and analyzed to derive meaningful insights that can be used to evaluate the performance of regenerative agriculture practices. The pre-processing stage is critical to ensure that the data used in the hybrid smart contracts is accurate, reliable, and consistent.