Decentralized agriculture sustainability certification system

Whitepaper

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v1.3

Abstract

This document presents the Decentralized Agriculture Sustainability Certification System, a network of people with the ambition to make agriculture sustainable in the world connected by blockchain technology. The objective is to create an incentive ecosystem for the agroecological transition through the creation of the Sustainable Agriculture Credit (CAS) token. Issued on the Ethereum blockchain, the token has a smart contract distribution model, where tokens will be distributed in the coming decades to producers and the community. Run by a sustainability proof algorithm, producers are the 'miners' of the system and will receive rewards according to the score obtained in the certification process. The evaluation method is based on the Sustainability in Agriculture Index (ISA) and on a decentralized inspection process. The System will evaluate rural producers based on two factors: the equivalent carbon balance and the impact on biodiversity and restoration of life processes. The result of the evaluations is measured on a scale and the System returns the sustainability score assigned to each inspected producer, with a positive score meaning a producer that sequesters carbon and improves biodiversity, while a negative score means a producer that emits carbon and destroys the life of the Planet. People and companies will be able to buy credits from approved producers and generate a certificate of contribution. The evaluated producers will receive a seal that proves their participation and will be able to disclose the result obtained to their clients. All data is public and stored in a decentralized and transparent way on the blockchain.

Industrial monoculture has several negative environmental impacts. This practice makes the place worse over time than before, extracting resources from the soil that contribute to erosion, contaminating the area with pesticides and other chemicals, killing biodiversity and using more and more natural resources like water. As humanity, we need to make agribusiness sustainable so as not to put future generations at risk. We need to make degenerative agribusiness regenerative. A small group of agroecological producers, still undervalued, put the environment first, producing food and other resources in harmony with nature. Today we see the development of sustainable agricultural techniques, such as regenerative agriculture, agroforestry and syntropic agriculture, techniques that follow the laws of nature and adapt its principles to food production, working together with biodiversity, making the soil increasingly richer and using fewer resources over time. There is already knowledge and technology to produce food sustainably, what is lacking is incentive. If our society's pattern of global food production is syntropic and not entropic, it will be possible to solve humanity's biggest problems such as global warming, recovery of biodiversity, water scarcity and food insecurity.

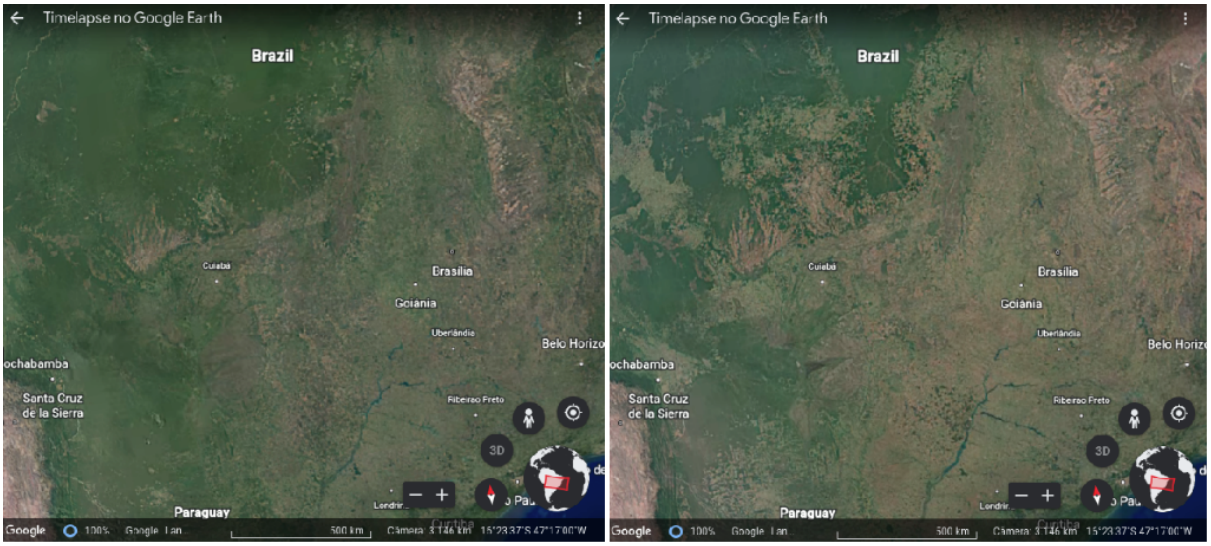
The aim of the project is to develop an agroecological, decentralized, reliable, open source incentive system using blockchain technology and with a sustainability proof mechanism to reward sustainable producers. The maximization of profits at any cost often means that the choice is the financial return, regardless of the environment. If, somehow, ecological agriculture becomes equal or even more profitable than unsustainable agriculture, it will no longer make sense to produce food harming the planet. Our mission is to make agriculture sustainable in the world and this whitepaper describes the functioning mechanism of the Sintrop System and the CAS token.

1. Mission

Our mission is to **make agriculture sustainable in the world**. We want to contribute to making the world a better place. A planet with more biodiversity, more forests, less carbon emissions, less global warming, more life in the soil and with the cyclical use of natural resources. Our fight is to protect, regenerate and care for nature.

2. Vision

Where are we going with planet earth? See in the figures below the comparison of part of the territory of South America in 1985 and 2020:



Google Timelapse 1985 vs 2020

The process of deforestation and desertification of the territory and soil degradation is visible and frightening. What will the next photo in this sequence look like, in 2050, if we keep up the pace of destruction? How much biodiversity will be lost? How much CO2 will be emitted into the atmosphere? And going a little further, imagine now how it will be in 2500? Will there be life on earth if we continue at this pace?

Industrial monoculture has several negative impacts on the environment. Much of the deforested areas in recent decades were burned to become pasture or extensive crops such as soy, corn and other commodities. The widely used pesticides, pesticides and chemicals degrade and contaminate the soil, harm the microorganism community, contaminate water, rivers and groundwater, in addition to several other impacts. Biodiversity, one of the planet's most precious assets, is fundamental to its existence. We need to protect the planet's biodiversity, not destroy it. Chemical pesticides are poisons applied with the intention of killing and destroying all local biodiversity other than the crop produced.

A living soil has organic matter and an ecosystem within itself, with numerous organisms and microorganisms inhabiting the place. It usually has a darker color and high fertility for agriculture. Erosion is a gradual process in which soil life, existing ecosystems and fertility for agriculture are lost. Industrial monoculture contributes significantly to soil erosion and desertification, as it extracts resources, kills biodiversity and creates a negative energy

balance in the system. The solution is not the industry that produces genetically modified seeds to survive the application of its chemical products. It makes rural producers hostage to this system, takes a large part of the profit that should belong to farmers and takes poisoned food to the consumer's table. The solution is to use nature's ancient wisdom to our advantage. We need to change direction before it's too late. We need to stop deforestation and burning nature. We need to reforest the world.

An amazing farming technique that generates a positive energy balance, including a positive carbon balance, is syntropic farming, popularized by Ernst Götsch. Entropy is a measure of the degree of disorder in a system, the loss of energy that generates a negative energy balance. While syntropy is a measure of the order of a system, energy gain through processes. Syntropic agriculture is an agriculture that contributes to improving the energy of a system: It makes the soil more fertile, brings more and more life and biodiversity, uses fewer resources, etc. A rural property that consumes soil resources, uses extensive amounts of water and other natural resources, contributes to making the place worse over time, generating a negative energy balance and impoverishing the area. A rural property that generates life, makes the soil more fertile, uses less resources over time and brings biodiversity to the region, contributes to making the system better than before, with a positive energy balance. There is an urgent need to spread a production system that, while producing tons of delicious products and food, regenerates degraded areas and brings back our forests [3].

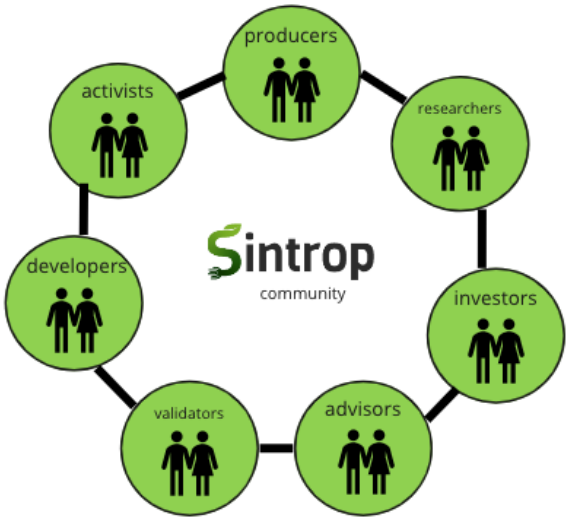
Our vision is a future in which world agriculture contributes to increasing biodiversity and reversing global warming. If at some point in the future the rate of regeneration and reforestation passes the rate of degradation and deforestation, we will reach a tipping point where the planet will regenerate. And the result will be the reversal of global warming and the mass extinction of biodiversity.

3. Agroecological transition

Our solution involves creating an incentive system for the agroecological transition. We invite food producers to participate in the Transition Network and walk over the coming decades towards increasingly improving the sustainability of their production. Producers who already work in an agroecological way have the opportunity to be rewarded with the CAS token for their work in carbon sequestration and promotion of biodiversity.

We also invite all non-ecological producers to be part of this change, especially those with monocultures such as soy, corn, other commodities and livestock. Producers should study the Agriculture Sustainability Index and seek to change their production towards agroecology. The objective is for a non-sustainable producer, such as a soybean monoculture, to start degrading the soil and begin to recover it. Enter consuming non-renewable energy and then start consuming clean energy. Enter a monoculture system and start planting trees. Enter buying chemical fertilizer and start producing your own biofertilizer and so on, in a virtuous circle.

4. The community



The foundation of the community are the Producers and Activists. In addition to them, the community involves other groups of users: Investors, Researchers, Validators and the Sintrop team of Developers and Advisors.

With the exception of investors who are free to register, users will only be able to register in the System after receiving an invitation to participate. Sintrop will be responsible for inviting the initial members of the community. And then, the most active Producers and Activists will be able to invite other people who want to fight for the same mission to participate in the System.

Activists invitation rules:

1. Only Activists with above average amount of Inspections will be able to carry out invitations.
2. Only 1 invitation every 2 Eras per user.
3. Considering the ideal ratio of five Producers for each Activist, invitations will only be allowed when the number of registered Producers is five times greater than the number of Activists.
4. Must have performed at least 3 Inspections.
5. Must have less than 3 dropouts

Producers invitation rules:

1. Only for producers with a positive sustainability score.
2. Minimum of 3 Inspections received.
3. *Above average sustainability score.*
4. One invitation every 2 Ages.

5. Sustainable Agriculture Index

One of the System's solutions is the creation of the ISA, or Agriculture Sustainability Index, which is a set of System evaluation rules. The level of ecological impact of each producer

will be measured on a scale through the Sustainability Score. A positive score means a producer that, in the sum of the evaluated factors, generates a positive impact on the planet, sequesters carbon and promotes biodiversity. A negative score means a negative impact on nature, emitting carbon and destroying biodiversity.

We will assess the impact of food production on the planet by analyzing several factors based on sustainability pillars and factors.

Pillars:

1. Carbon footprint
2. Biodiversity

Sustainability factors:

1. Soil
2. Animal biodiversity
3. Plant biodiversity
4. Water
5. Electricity
6. Sewage and effluentes
7. Fertilizers
8. Defensives
9. Packaging
10. Fossil fuels
11. Deforestation
12. Native reserve

The result will be the category of syntropic food producers, which in the sum of the involved production factors contribute positively to the planet. It will be the function of researchers to design and develop the Index.

See Appendix A for a practical example of ISA

6. The time

The System's units of time are Eras and Epochs. Each Age is intended to be approximately one month in length, and one Epoch equals 72 Ages, approximately 6 years. According to *Etherscan*, the Ethereum blockchain adds a new block to the network every 13.5s and this will be the basis for calculations involving time.

Blocktime (s)	13,50
Blocks per hour	267
Blocks per day	6.400
Blocks per ERA	192.000
ERAs per Epoch	72
Blocks to Epoch 2	13.824.000

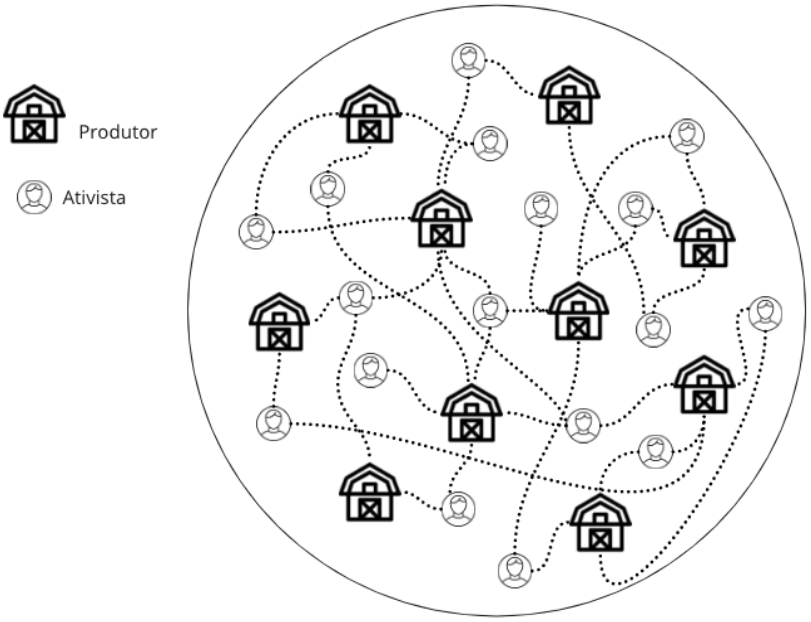
Blocks to Epoch 3	27.648.000
Blocks to Epoch 4	41.472.000
Blocks to Epoch 5	55.296.000
Blocks to Epoch 6	69.120.000
...	...

7. Inspections

The Activists are the users responsible for carrying out the Inspections and assessing the level of sustainability of the producers.

They will be able to accept the Inspections they want to do and then go to the property to carry out the Inspection. The Inspection system will be decentralized, with Inspections carried out by the Activists so that the same person cannot evaluate the same producer more than once.

For the Inspection to be valid, a proofPhoto must be sent to the System, or a photo of proof that the Activist visited and inspected the production. For this, when registering in the System, both users must send a proof photo. And in the Inspection, a photo must be sent containing both people at the production site and the result obtained. After accepting an inspection, the Activist will have ¼ Era to perform the inspection and send the data to the blockchain. If you do not do it, you will be penalized with one withdrawal and when you add three withdrawals you will no longer be able to participate.



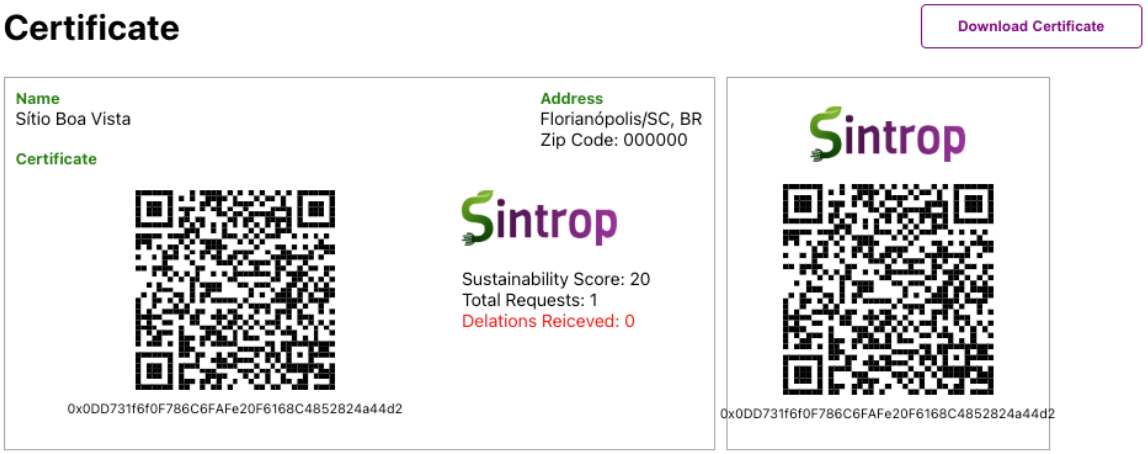
8. Certification rules

1. Each producer can only request one Inspection at a time.

2. A producer who has already been inspected can only request a new Inspetion 2 Eras after the conclusion of the previous Inspection.
3. One activist can not accept and Inspection of a Producer that he has previously inspected.
4. Once the Inspection is accepted, the Activist will have ¼ of Era to carry out the Inspection and send the data to the System.
5. An inspection can only be accepted ¼ Era after requesting it.
6. The Activist who accepts an Inspection and does not carry it out will be penalized with a withdrawal.
7. Inspections without proofPhoto will be considered invalid.
8. Inspections without calculations will be considered invalid.
9. Totally sustainable = +10 isaPoints
10. Partially sustainable = +5 isaPoints
11. Neutral = 0 isaPoints
12. Partially not sustainable = -5 isaPoints
13. Totally not sustainable = -10 isaPoints

9. The Stamp

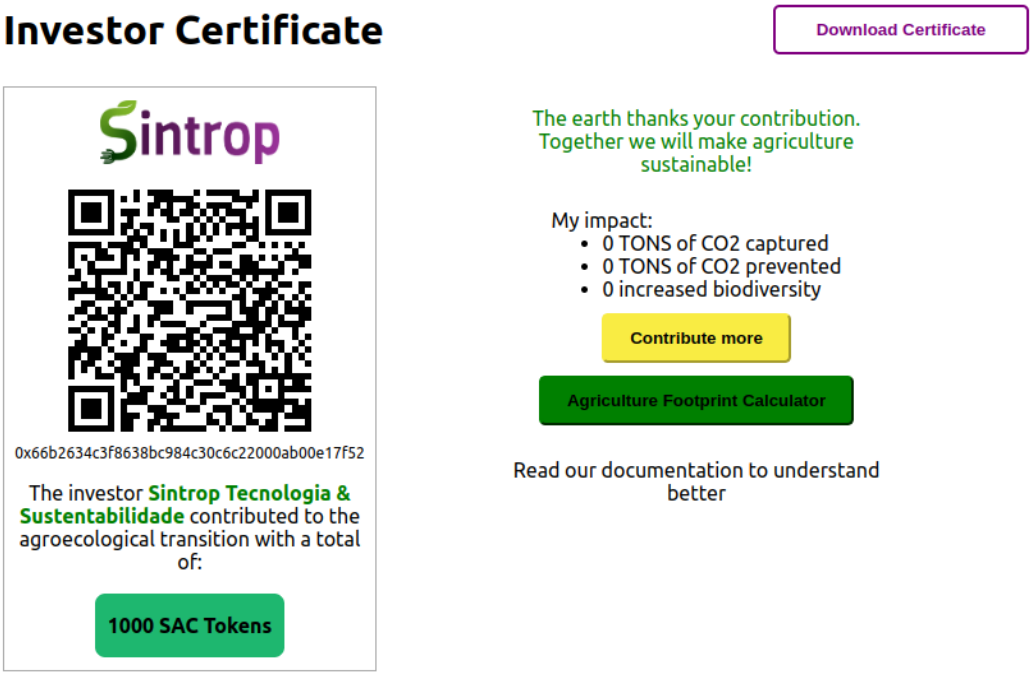
All System data is public and stored in a decentralized way on the Ethereum blockchain. So the stamp is the simple reading of the data on the blockchain. The producer will be able to download his certificate as a pdf, image and disclose the result obtained to his public.



10. Token CAS “Sustainable Agriculture Credit”

The system introduces the utility type token CAS - Sustainable Agriculture Credit, which will be distributed algorithmically as a reward and incentive for agroecological transition. It is scheduled to be issued over the next few decades and distributed according to the sustainability score obtained by producers in inspections.

Companies and people interested in investing and encouraging this market will be able to acquire tokens from Producers and the community and exchange them in the Sintrop System for the Certificate of Contribution to the agroecological transition, which attests to their contribution to sustainable agriculture with the impact generated in terms of CO2 equivalent and biodiversity.



Investors certificate example

11. Token distribution model

The System will algorithmically distribute, through smart contracts, tokens to user groups in accordance with the set of rules described below. The unit of time is Eras and Epochs, where each era is equivalent to approximately 1 month, and each epoch is equivalent to 72 Eras, approximately 6 years. So approximately 95% of the tokens will be distributed over the next 40 years. Each Era, approved users will earn the right to withdraw tokens from smart contracts for their contribution to the community. Each Season, the reward per distributed Era is halved through the halving mechanism.

For the producer to be approved by the system and be able to receive the token, he will have to be approved by the following criteria:

1. Sustainability score > 0

2. Minimum of 3 inspections received, by 3 different activists
3. Maximum 12 eras without receiving inspections
4. Maximum ISA score of 1000

50.00% of tokens distributed to approved sustainable producers according to their sustainability score.

ProducerPool	
Total reward tokens	750.000.000

Period	Epoch 1	Epoch 2	Epoch 3	Epoch 4	Epoch 5	Epoch 6	Epoch 7	Epoch 8
Reward per *era*	5.000.000	2.500.000	1.250.000	625.000	312.500	156.250	78.125	39.063
Total period reward	360.000.000	180.000.000	90.000.000	45.000.000	22.500.000	11.250.000	5.625.000	2.812.500
% of total	48,00%	24,00%	12,00%	6,00%	3,00%	1,50%	0,75%	0,375%

For the activist to be approved by the system and be able to receive the rewards, he will have to be approved by the following criteria:

1. Minimum of 3 inspections performed
2. Maximum 3 eras without performing inspections
3. Maximum of 5 penalties per withdrawal

The activist who passes these criteria will be approved by the system and will be able to receive the rewards. The reward, in turn, will be distributed in a weighted manner according to the number of inspections carried out by each activist.

12.00% of the tokens distributed to remuneration activists for service provided to the audit community of rural producers.

ActivistPool	
Total reward tokens	180.000.000

Period	Epoch 1	Epoch 2	Epoch 3	Epoch 4	Epoch 5	Epoch 6	...
Reward per *era*	1.200.000	600.000	300.000	150.000	75.000	37.500	...
Total period reward	86.400.000	43.200.000	21.600.000	10.800.000	5.400.000	2.700.000	...
% of total	48,00%	24,00%	12,00%	6,00%	3,00%	1,50%	...

2.00% of the tokens distributed to agroecological researchers in compensation for services rendered in research and development of the Sustainability Index in Agriculture. The reward for approved researchers will be made equally among all, with the aim of not stimulating competition but cooperation between them.

ResearcherPool	
Total reward tokens	30.000.000

Period	Epoch 1	Epoch 2	Epoch 3	Epoch 4	Epoch 5	Epoch 6	...
Reward per *era*	200.000	100.000	50.000	25.000	12.500	6.250	...
Total period reward	14.400.000	7.200.000	3.600.000	1.800.000	900.000	450.000	...
% of total	48,00%	24,00%	12,00%	6,00%	3,00%	1,50%	...

4.50% of tokens distributed to developers and team members as compensation for system development services provided. The distribution to the developers will be done through two different contracts, one as a reward for the pre-launch development of the system on the mainnet and the other after the start of the operation.

1.00% of the distributed tokens for a period of 18 eras from the moment the contract was deployed on the Ethereum mainnet. The distribution will be weighted according to the level of each developer.

DevelopersPool 1.0	
Total reward tokens	15.000.000
Period	18 *eras*
Reward per *era*	833.333

3.50% of distributed tokens.

DevelopersPool 2.0	
Total reward tokens	52.500.000

Period	Epoch 1	Epoch 2	Epoch 3	Epoch 4	Epoch 5	Epoch 6	...
Reward per *era*	350.000	175.000	87.500	43.750	21.875	10.938	...
Total period reward	25.200.000	12.600.000	6.300.000	3.150.000	1.575.000	787.500	...
% of total	48,00%	24,00%	12,00%	6,00%	3,00%	1,50%	...

2.00% of the tokens distributed to project validators as remuneration for system review and maintenance services provided. The distribution will be equal among all.

ValidatorsPool	
Total reward tokens	30.000.000

Period	Epoch 1	Epoch 2	Epoch 3	Epoch 4	Epoch 5	Epoch 6	...
Reward per *era*	200.000	100.000	50.000	25.000	12.500	6.250	...
Total period reward	14.400.000	7.200.000	3.600.000	1.800.000	900.000	450.000	...
% of total	48,00%	24,00%	12,00%	6,00%	3,00%	1,50%	...

0.50% of tokens distributed to project advisors over 120 eras.

AdvisorsPool	
Total reward tokens	7.500.000
Period	120 *eras*
Reward per *era*	62.500

12. Proof of sustainability

The reward to producers will be distributed weighted according to the sustainability score, isa score, of each certified producer.

Being,

r = reward per era
ISA(p) = producer p ISA score
ISA(t) = sum of all approved producers ISA score

The reward in a given era that must be approved to a producer p will be:

$r(p) = (ISA(p) / ISA(t)) * r$

As a result, the higher the sustainability score, the more tokens the producer will be entitled to receive and he will be able to optimize his earnings by requesting more inspections and improving the sustainability of his production.

The reward for activists will be distributed in a weighted manner according to the number of inspections carried out by each one, discounted by the number of withdrawals.

Being,

d = activist dropouts
i = number of inspections carried out by the activist
r = reward per era
q = number of total inspections performed on the system

The reward in a given era of an activist (a) will be:

$r(a) = [(i - 3*d) / q] * r$

13. The technology

The system uses blockchain technology to store data and execute smart contracts and is being developed on the Ethereum platform. The software is open source and, with the exception of the network cost of Ethereum, free for everyone to use.

Since the publication of Satoshi Nakamoto in 2008 [4], blockchain technology has been introduced to the world. This technology emerged with the aim of decentralizing “conventional” organizations. One of the main characteristics of this technology is the data storage structure in blocks, where a block carries the hash of the previous block in order to connect them algorithmically. Another important characteristic is the distributed data structure, in which instead of storing data centrally on a server with private access, the data is stored in the participants, called network nodes, where each participating computer stores a copy of the record. of the transactions carried out.

Contributing to decentralization, Buterin, Gavin Wood and the Ethereum foundation [5-6] launched a new blockchain with a different purpose than Bitcoin: To develop a decentralized, open-source computer infrastructure that runs programs or smart contracts automatically.

The Ethereum platform allows developers to create powerful decentralized applications with built-in functions. Providing high availability, auditability, transparency and neutrality [7]. Our system is being developed on top of the Ethereum platform. Instead of registering system information and data in a centralized database with restricted access, we will store all transactions, including inspection results, ISA, activist and producer information, as well as votes and sustainability categories in the Ethereum blockchain. In an open way, transparent to everyone and distributed on several computers that are part of the network. And that's why we will use the blockchain, to allow the development of the application in a decentralized way. The technology of IPFS, or Inter Planetary File System as a storage system [8-9] is also being used to apply unique hashes to texts and images.

14. Security

The System will allow a user to make accusations if he encounters any practice contrary to the rules of the system. The objective is to encourage the community itself to carry out maintenance work for the System, so that the registered complaints can be investigated.

It will be the role of Validators to verify and maintain the System to exclude users and invalidate reported inspections. Each Validator can vote to invalidate an inspection, and when 50% + 1 of the validators vote, the inspection will no longer be valid, removing the user from the distribution pools and no longer allowing interaction with the System.

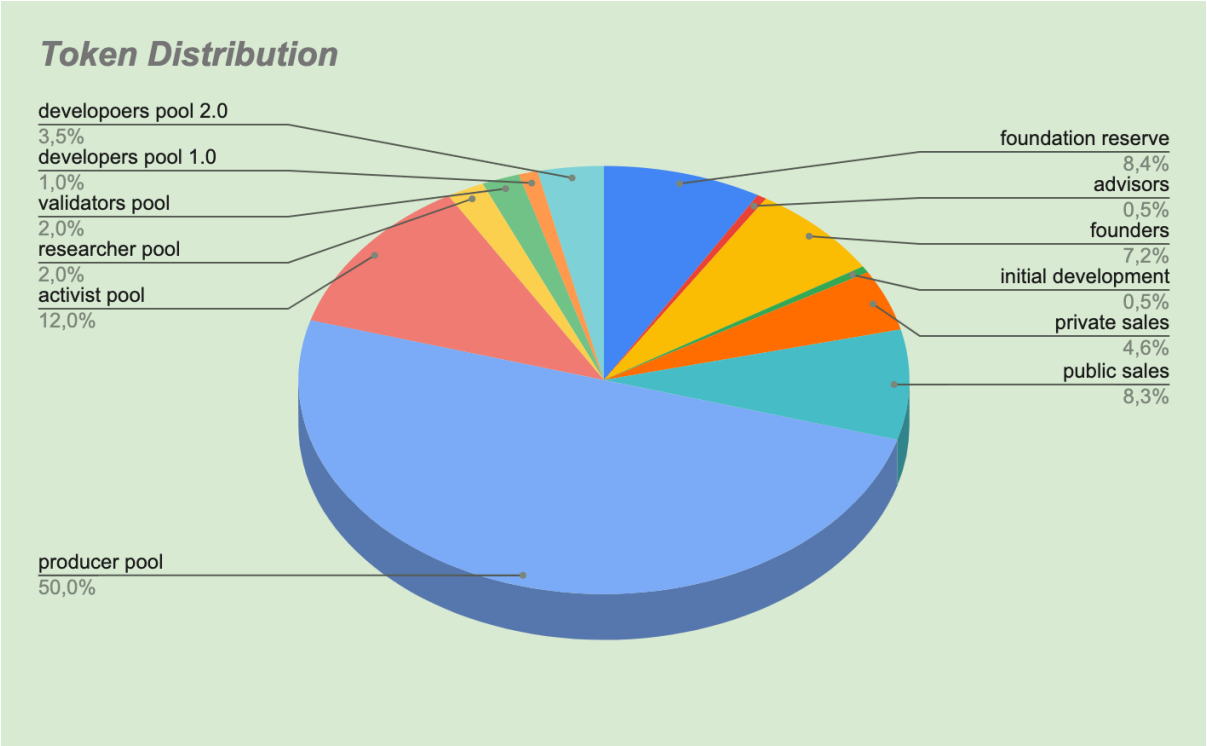
15. Tokenomics

name	Sustainable Agriculture Credit Token
symbol	CAS
totalSupply	1.500.000.000

Distribution of tokens by user groups:

Distribution	%	Number of tokens
foundation reserve	8,40%	126.000.000
advisors	0,50%	7.500.000
founders	7,20%	108.000.000
initial development	0,50%	7.500.000
private sales	4,60%	69.000.000
public sales	8,30%	124.500.000
producer pool	50,00%	750.000.000
activist pool	12,00%	180.000.000
researcher pool	2,00%	30.000.000

validators pool	2,00%	30.000.000
developers pool 1.0	1,00%	15.000.000
developers pool 2.0	3,50%	52.500.000
Total	100,00%	1.500.000.000



Token sales	%	Number of tokens
Private sales 1	2,60%	39.000.000
Private sales 2	2,00%	30.000.000
ICO	8,60%	129.000.000

16. Token value

The value of the token is in the equivalent positive impact of carbon and in the restoration of life processes generated by the System's network of producers. Each Producer will be assessed with an estimate of carbon equivalent sequestered per month and projection of biodiversity in its ecosystem. And the sum of all Producers in the System will be the monthly network impact.

In the first Epoch, a total of 6,800,000 tokens per Era will be distributed to System users. Making projections of the network's carbon sequestration of 3,500, 1,250,000 and

20,000,000 tons of CO2/month we arrive at the impact projection table below and the token ratio vs kgCO2e and units of life. The greater the network of syntropic producers reforesting the world at the same time that food is produced, the greater this relationship will be.

Network impact projection				
Network tCO2e / month	3.500	1.250.000	20.000.000	...
Biodiversity life units	525.000	187.500.000	3.000.000.000	...
Monthly distribution	6.800.000	6.800.000	6.800.000	...
CAS / kgCO2e	0,51471	183,82353	2941,17647	...
CAS / lifeUnits	0,07721	27,57353	441,17647	...

*biodiversity life units just as an example

17. Conclusion

People need to understand the impact that the food they buy has on the planet. Continuing to buy from a system that destroys nature means being part of it. The more people choose products with a positive environmental impact when buying food, the greater the speed of change. We need to reforest the world to reverse global warming and nurture Earth's health. A super smart way to regenerate the planet is to do it while producing food. The solution to our problems as a society and environmental problems is not the responsibility of governments or NGOs. The solution lies in the environmental responsibility of each individual and in the actions of people with the intention of leaving the world a better place. We need to act, we need to change the direction the world is going before it's too late.

Either agriculture will save the Earth, or destroy it. Which side will you be on?

Appendix A - Example of the Sustainable Agriculture Index

Sustainable Agriculture Index

Info	Created By	Name	Description
...	0x3B73c100737...	Índice de Árvores por Hectare	Categoria para medir a quantidade de árvores n...
...	0x3B73c100737...	Índice de Queimadas	Categoria para medir a quantidade de queimad...
...	0x3B73c100737...	Desmatamento	Categoria para medir o desmatamento e seu im...
...	0x3B73c100737...	Área nativa	Categoria para medir a quantidade de vegetaçã...
...	0x3B73c100737...	Energia	Categoria para medir a quantidade e origem da ...
...	0x3B73c100737...	Embalagens	Categoria para medir a quantidade e tipos de e...
...	0x3B73c100737...	Alimentação animal	Categoria para medir a quantidade, origem e im...
...	0x3B73c100737...	Combustível fóssil	Categoria para medir a utilização de comustível...
...	0x3B73c100737...	Adubação e Fertilizantes	Categoria para medir a utilização de insumos fe...
...	0x3B73c100737...	Índice de matéria orgânica no solo	Categoria para medir o índice de matéria orgâni...
...	0x3B73c100737...	Esgoto e efluentes	Categoria para medir o destino de esgoto e efl...
...	0x3B73c100737...	Água	Categoria para medir a origem e quantidade de...
...	0x3B73c100737...	Defensivos	Categoria para medir a utilização de defensivos...

Exemplo do ISA v.3.

Categoria 1:

Category Name
Índice de Árvores por Hectare

Category Description
Categoria para medir a quantidade de árvores na propriedade e seu impacto de sequestro de carbono. Considere que cada árvore adulta de 3 anos ou mais absorve em média 20kg de CO2, e que árvores com menos de três anos absorvem 5 kg de CO2 por ano. Quanto de carbono foi absorvido por hectare no último ano? Calcule somente das áreas cultivadas e desconsidere áreas nativas ou de proteção. Justifique sua resposta

Category Tutorial
Calcule a quantidade de árvores de toda a propriedade estimando a idade delas. Registre foto das áreas recorridas. Utilize imagens de drone e satélite caso possível. Uma propriedade de 10 hectares, a qual possui 20 mil árvores adultas e 10 mil árvores crianças sequestra anualmente [(20*20.000) + (5*10.000) = 450.000 kg 450 toneladas de CO2 = 450/10 = 45 toneladas de CO2 por hectare por ano. Registre todos seus cálculos e justifique os números encontrados.

Totally Sustainable
Mais de 30 toneladas CO2/ha/ano

Partially Sustainable
Acima de 1 tonelada CO2/ha/ano

Neutro
Não se aplica

Partially Not Sustainable
Entre 0,5 e 1 tonelada CO2/ha/ano

Totally Not Sustainable
Menos de 0,5 tonelada de CO2/ha/ano

Categoria 2:

Category Name
Índice de Queimadas

Category Description
Categoria para medir a quantidade de queimadas na propriedade e seu impacto na emissão de carbono. Considere que cada hectare de área queimada equivale a 20 toneladas CO2 emitidos na atmosfera. Quantas queimadas ocorreram na propriedade nos últimos 12 meses e qual foi a emissão por queimadas do produtor no último ano? Justifique sua resposta!

Category Tutorial
Calcule a quantidade de queimadas ocorreram na propriedade. Investigue o histórico do produtor e da região. Um produtor que ocasionou 2 queimadas em uma área de 5 hectares emitiu 2 * 5 * 20 = 200 toneladas de CO2 no ano.

Totally Sustainable
0 queimadas e 0 CO2 emitido. Está reflorestando outras áreas

Partially Sustainable
0 queimadas e 0 CO2 emitido. Não está reflorestando outras áreas

Neutro
Não se aplica

Partially Not Sustainable
Apenas 1 queimada natural e não intencional. Menos de 10 toneladas CO2/he/ano emitido.

Totally Not Sustainable
Pelo menos 1 queimada intencional ou mais de 2 queimadas não intencionais. Mais de 10 toneladas de CO2/ha/ano

Categoria 3:

Category Name
Desmatamento

Category Description
Categoria para medir o desmatamento e seu impacto na emissão de carbono e perda de biodiverisidade. Considere que para cada hectare de terra desmatado é gerado um saldo negativo de 1000 t de CO2/ha/ano devido a queima, deixar de sequestrar e deixar de gerar descendentes. Quantos hectares foram desmatados e qual é o saldo de carbono do produtor? Justifique sua resposta

Category Tutorial
Calcule a quantidade de hectares que foram desmatados desde a entrada do produtor na área. Pesquise por imagens de satélite e histórico de desmatamento da região para verificar a informação. Por exemplo uma propriedade que desmatou 10 hectares estima-se seu saldo de negativo de 10 * 1.000 = 10 mil toneladas CO2/ano

Totally Sustainable
0 hectares e 0 emissões de CO2. Está reflorestando outras áreas

Partially Sustainable
0 hectares e 0 emissões de CO2. Não está reflorestando outras áreas.

Neutro
Não se aplica

Partially Not Sustainable
Menos de 5 t CO2/ha/ano

Totally Not Sustainable
Mais de 5 t CO2/ha/ano

Categoria 4:

Category Name
Área nativa

Category Description
Categoria para medir a quantidade de vegetação nativa e seu sequestro de carbono. Considere que cada hectare de vegetação nativa sequestra 10 toneladas de CO2/ha/ano. Qual foi a quantidade de carbono sequestrada de CO2 no último ano? Justifique sua resposta

Category Tutorial
Calcule a quantidade de hectares de reserva nativa da propriedade. Considere apenas áreas não degradadas e não exploradas. Estime a quantidade de CO2 sequestrado. Uma propriedade que possui 12 hectares de reserva nativa terá sequestrado 120 toneladas de CO2 no último ano.

Totally Sustainable
Mais de 100 toneladas CO2/ha/ano

Partially Sustainable
Mais de 10 toneladas CO2/ha/ano

Neutro
Não se aplica

Partially Not Sustainable
Não possui reserva nativa. Está reflorestando outras áreas.

Totally Not Sustainable
Não possui reserva nativa. Não está reflorestando.

Categoria 5:

Category Name
Energia

Category Description
Categoria para medir a quantidade e origem da energia elétrica utilizada e seu impacto. Considere como unidade de consumo o kwh. Considere que 1 kwh emite 800g de CO2 de fontes não renováveis como o petróleo, carvão mineral e queima de biomassa. Emite 500g por kwh do gás natural fóssil e geotérmica. Emite 10g de CO2 das fontes nuclear, solar e biogás. De onde vem a energia utilizada? Qual foi o consumo total em kwh no último ano? Qual foi o consumo médio por hectare por mês? Qual foi sua pegada de carbono total? Justifique sua resposta

Category Tutorial
Verifique de onde vem a energia utilizada na propriedade. Verifique os contratos de compra de energia e também contas em caso de utilização da rede de transmissão externa. Em caso de compra de energia da rede sem saber exatamente a origem, utilize a matriz energética do país como base para cálculos.

Totally Sustainable
Produz 100% da sua energia de fontes renováveis.

Partially Sustainable
Produz parcialmente sua própria energia de fontes renováveis. Menos de 100 kg de CO2/ha/ano

Neutro
Não se aplica

Partially Not Sustainable
Não produz a própria energia. Menos de 500 kg de CO2/ha/ano

Totally Not Sustainable
Não produz a própria energia. Mais de 500 kg de CO2/ha/ano

Categoria 6:

Category Name
Embalagens

Category Description
Categoria para medir a quantidade e tipos de embalagens utilizadas e seu impacto. Considere que cada kg de embalagem plástica emite 4 kg de CO2. Cada kg de papel ou cartão = 1 kg de CO2. Cada kg de alumínio = 2 kg de CO2. Cada kg de vidro = 2,5 kg de CO2. Cada kg de embalagem biodegrável = 0,01 kg de CO2. Cada kg de isopor = 4kg de CO2. Desconsidere todas embalagens retornáveis que são reaproveitadas. Quantos kg de cada uma das embalagens acima o produtor utilizou e qual foi seu impacto nas emissões de CO2 nos últimos 12 meses? Justifique sua resposta

Category Tutorial
Calcule a quantidade e peso de cada um dos tipos de embalagens utilizados durante os últimos 12 meses. Pese individualmente cada uma das embalagens utilizadas para saber o peso de cada e calcule quantas unidades de cada tipo foram distribuídas. Por exemplo um produtor que utilizou 10.000 embalagens plásticas de 5g cada, 1.000 embalagens de isopor de 10g cada e 1.000 embalagens biodegradáveis de 10g cada emitiu um total de [10.000 * 4 * 5g] + [1.000 * 4 kg * 10g] + [1.000 * 0,01 * 10] = 200.000 + 40.000 + 100 = 240.100 g = 240,1 kg de CO2 emitidos

Totally Sustainable
Não utiliza nenhum tipo de embalagem. 0 kg de CO2.

Partially Sustainable
Utiliza apenas embalagens biodegradáveis. Menos de 1 ton de CO2 de emissão.

Neutro
Não se aplica

Partially Not Sustainable
Utiliza alguns dos tipos de embalagens. Menos de 100 kg de CO2 de emissão.

Totally Not Sustainable
Utiliza alguns dos tipos de embalagens. Mais de 100 kg de CO2 de emissão.

Categoria 7:

Category Name
Adubação e Fertilizantes

Category Description
Categoria para medir a utilização de insumos fertilizantes, adubação e seu impacto. Considere que cada tonelada de fertilizante químico, de qualquer natureza, emite 25 toneladas de CO2. Considere que 1 tonelada de insumos biológicos comprados emite 1 tonelada de CO2. Considere que cada tonelada de biofertilizante produzido pelo produtor sequestra 1 tonelada de CO2. No último ano, qual foi o consumo de fertilizantes químicos do produtor e qual foi seu impacto em CO2? Qual foi sua produção de biofertilizante e seu impacto? Justifique sua resposta

Category Tutorial
Confira as compras de insumos realizadas pelo produtor e registre a quantidade comprada no último ano. Calcule a quantidade de biomassa produzida. Um produtor que utilizou no úlitmo ano 1 tonelada de fertilizantes químicos emitiu 25 toneladas de CO2.

Totally Sustainable
Não utiliza nenhum tipo de insumo químico. 0 CO2 emitido e mais de 1 tonelada de CO2 sequestrado.

Partially Sustainable
Não utiliza nenhum tipo de insumo químico. 0 CO2 emitido e mais de 1 kg de CO2 sequestrado.

Neutro
Não se aplica

Partially Not Sustainable
Utiliza insumos químicos. Menos 1 tonelada de CO2 emitido.

Totally Not Sustainable
Utiliza insumos químicos. Mais de 1 tonelada de CO2 emitido.

Categoria 8

Category Description
Categoria para medir a utilização de defensivos na propriedade e seu impacto. Considere que cada kg de qualquer tipo de defensivo químico, herbicida, bactericida ou fungicida equivale a perda de biodiversidade em 1.000 unidades de vida. Considere que cada kg de defensivo biológico natural de qualquer tipo equivale a perda de 100 unidades de vida. Qual foi o consumo de defensivos químicos no último ano? Quais produtos foram utilizados? Quantas unidades de vida foram perdidas? Justifique sua resposta

Category Tutorial
Verifique todos os tipos de defensivos químicos utilizados e a quantidade de cada no úlitmo ano. Verifique notas fiscais de compra. Verifique se possui equipamentos de aplicação. Um produtor que consumiu no último ano 1000 kg de defensivos químicos ocasionou a perda de 1.000.000 unidades de vida.

Totally Sustainable
Não utiliza nenhum tipo de defensivo químico ou biológico, herbicida ou fungicida. 0 unidades de vida perdidas.

Partially Sustainable
Não utiliza nenhum tipo de defensivo químico mas utiliza defensivos biológicos naturais.

Neutro
Não se aplica

Partially Not Sustainable
Utiliza defensivos químicos, fungicidas ou herbicidas. Mais de 1 unidade de biodiversidade perdida.

Totally Not Sustainable
Utiliza defensivos químicos, fungicidas ou herbicidas. Mais de 50.000 unidades de perda de biodiversidade.

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Veja o exemplo completo do ISA na versão 3 do Sistema na rede de testes Goerli.

Voltar

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