Blockchain and the changes for sustainability schemes

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Content

- Who is Meo Carbon Solutions?
- What is the state of affairs of 4C?
- What are the key sustainability challenges in the coffee sector?
- How can modern technologies like blockchain support the implementation of sustainable and deforestation free supply chains in the coffee sector?
Meo Carbon Solutions – Who we are

• Meo Carbon Solutions (MCS) is an independent management consultancy based in Cologne

• **Sustainability** is the core focus of MCS’s work
  • Data collection and Monitoring (e.g. land use change, life cycle assessments)
  • Supply chain implementation (e.g. risk assessments, traceability, integration of smallholders, certification)
  • Understanding the impact (e.g. policy consulting, market analysis, scenarios)

• MCS has developed i.a. **ISCC**, a globally leading certification scheme for agricultural commodities

• Comprehensive **experience and knowledge** will be made available for 4C to support the further development of the scheme
Update: Actual 4C Facts and Figures

- 4C coffee produced in 28 countries
- 500,000+ farmers are producing 4C coffee
- 23 cooperating certification bodies
- No cherry picking for low hanging fruits

- Effective and cost efficient solutions
- Recognized by SAI Silver, GCP and IEH
- Strict quality and integrity management
- Effective improvement plans guarantee positive impact

- Implements sustainable solutions for the entire sector
- Innovative risk assessment tools
4C is a reliable and cost-efficient mainstream solution in the sustainable coffee market

More than 2.5 Mio tons of coffee have been certified under 4C*

Leading brand owners trust 4C compliant coffee
What are key sustainability challenges as seen by major players in the coffee market?

"Traceability in supply chains is key."

"Tackling deforestation in our supply chains is most important for us."

"Child and Forced Labor are unacceptable practices."

"Smallholders need market access."

"Social and environmental impacts of coffee production must be equally addressed."

"How to improve yields, income and living standards of smallholders?"

"What makes a label reliable and responsive – and cost efficient at the same time?"

"How can consumer trust in the label be established?"
How can new technologies support certification to address those challenges?

- Verification on coffee production level
- Traceability through the supply chain

2014
2015

Blockchain
Walmart has told all its suppliers of leafy greens to sign up to its blockchain solution. Coffee to follow?

“Walmart expects all suppliers of fresh leafy greens to Walmart stores and Sam’s Club wholesalers to have end-to-end traceability through blockchain by the end of September 2019.”

Supply Management, 3 October 2018
Blockchain is a technology that can support the back-tracking of products in the food chain

- Blockchain allows the secure tracking of products from the shelf back to the plantation
- Blockchain technology works with a decentralized system that leads to sublime fraud-resistance
- The technology can be included into running company systems and increases efficiency and security
- Pilot applications are running in different sectors, e.g. fish sector
Several and not a single player ensures that the information in the database are trustworthy and not rigged.
Traceability requires that sustainability information is transferred through the whole supply chain.
Using a blockchain can support the reliable transfer of data, but cannot replace verification of data forwarded in the supply chain.
A key question is how to verify compliance with sustainability criteria in an efficient and credible way?

What we want to achieve:
- Secure integration of smallholder production into sustainable supply chains
- Reduction of deforestation
- Improved agricultural practice
- No forced labor, no child work
- Stable living standards of farmers

Challenges
- Small individual fields and plantations
- Large numbers of farmers
- Efficient monitoring needed
Many satellites and sensors are observing the earth’s surface in short time intervals producing images with high resolutions.
4C applies innovative technologies and tools for risk assessment and verification of compliance - Examples

With the 4C Field Recorder App, exact field coordinates and plantation outlines can be tracked.

With GRAS, fast, easy and reliable automated risk assessments of 4C Units against critical sustainability criteria can be conducted.

4C developed an easy-to-use tool to verify 4C unit members against the Brazilian Transparency List of Contemporary Slave Labour.
Example Colombia: Efficient analysis of a large number of smallholder production areas regarding deforestation

Sustainability Criteria (Example LUC)

- Assessment of case-specific sourcing area, e.g. a radius of 150 m
- For each farmer, sustainability criteria can be checked
A comprehensive risk factor can be calculated for each farmer, covering a defined set of criteria (ecological, social)

<table>
<thead>
<tr>
<th>Risk Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Calculation of risk factor for each farmer</td>
</tr>
<tr>
<td>• Index allows identification of risk hotspots and impact assessment through continuous monitoring</td>
</tr>
</tbody>
</table>

Example

© GRAS GmbH

Example Colombia
Single farmers can then ranked and analysed in detail.

### Legend
- Low risk sourcing area
- Medium risk sourcing area
- High risk sourcing area
- Town

### GRAS Risk Level
- Low
- Medium
- High

<table>
<thead>
<tr>
<th>Farmer</th>
<th>Analysed area</th>
<th>Land Use Change</th>
<th>Overlap with No Go Area</th>
<th>Overlap with Risk Area</th>
<th>GRAS Risk Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example Farmer 108</td>
<td>7.2 ha</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>low</td>
</tr>
<tr>
<td>Example Farmer 221</td>
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<td>-</td>
<td>-</td>
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<td>low</td>
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<tr>
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<tr>
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<td>low</td>
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<tr>
<td>Example Farmer 5</td>
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<td>1.2 ha</td>
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<tr>
<td>Example Farmer 100</td>
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<td>1.2 ha</td>
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<tr>
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<tr>
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<td>2.3 ha</td>
<td>-</td>
<td>1.7 ha</td>
<td>high</td>
</tr>
</tbody>
</table>
An automated analysis of field polygons can be conducted. Compliant Smallholders can be selected and trained.

Collect GPS data

Automated check of the field polygons against deforestation and protected area within Data Management System

Mobile Smallholder App

Not located in protected areas

Deforestation detected on farm

In case deforestation is identified on the farm and/or the farm is located within protected areas, the farm is not directly suitable for auditing.

In case no deforestation is identified and the farm is located outside of protected areas, the farm is suitable for auditing.
4C as cost-effective mainstream solution works towards joint solutions with positive long-term effects in the coffee sector

“The 4C program helps us to develop the organization of our fincas and to increase the awareness regarding environmental issues. **Quality of coffee beans** has also been improved. **Fair agreements** with workers have been implemented thanks to 4C.”

Diana Florez, President, Ubaque UbaCafé Cooperativa, Colombia
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