

Cacao-Tech: Building Trust for Responsible Data Sharing in Ecuador

Open-Source Implementation Guide

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Document Information

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Project URLs:

- <https://drg4food.eu/meet-the-winners-cacao-tech/>
- <https://drg4foodtoolbox.eu/project/cacaotech/#toolbox>

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Abstract

This document explains how Cacao-Tech approached data collection, privacy, and trust in Ecuador during the DRG4FOOD project. It describes how the Digital Responsibility Goals (DRGs) — privacy, human agency, fairness, and transparency — were applied in a sector that operates mostly through informal and relationship-based systems.

The report draws from two field visits in December 2024 and March 2025, lessons from the consent process, and the creation of a shared privacy statement with farmers and cooperatives. It aims to provide practical guidance for researchers and practitioners who work in informal agricultural economies and want to build trust while meeting data protection standards.

All interviews and meetings followed the Chatham House Rule, which allows information to be shared for learning but protects the identity of all participants. This rule supported open discussion and reinforced confidence in how information was used.

References to related materials and templates can be found in the annexes.

1. Introduction

Cacao-Tech's work in Ecuador combined technology development with social learning. The project tested how digital responsibility can be practiced in a real agricultural context, where privacy, consent, and data ownership are understood differently from European settings.

The goal was clear: to collect and share traceability and quality data responsibly, while respecting local values and relationships. Achieving this balance required navigating two systems.

On one side were European research obligations such as GDPR and formal consent documentation. On the other was the reality of Ecuador's cacao communities, where trust is personal, decisions are collective, and written forms are rare.

All activities were guided by the Digital Responsibility Goals and the Chatham House Rule. Together, they formed the ethical basis for our work. The DRGs helped us define what responsible data means in practice, while the Chatham House Rule created a safe environment for honest dialogue.

2. Value Chain Context

Informal structure of the cacao sector

Ecuador's cacao sector operates largely outside formal systems. Most producers are smallholders who sell beans or pulp directly to local buyers or cooperatives. Deals are based on reputation and trust. Contracts and signatures are uncommon and often perceived as unnecessary or even mistrustful.

The chain becomes formal only at the point of aggregation, when products reach cooperatives or exporters who need to meet traceability and quality requirements. Until that point, information is shared verbally and through relationships.

For a project that relies on data, this informality is both a challenge and an opportunity. It demands approaches that build confidence gradually and fit within existing cultural and social norms.

Project frame and fieldwork

Within DRG4FOOD, Cacao-Tech developed two connected digital tools:

- **CacaoTech360**, a traceability platform that links quality, impact, and origin data across the supply chain, and
- **QCTech360**, a system for analyzing cocoa bean and pulp quality through Near-Infrared (NIR) technology.

Both rely on data from farmers and cooperatives. The project therefore focused as much on social responsibility as on technical design.

Two field missions were carried out:

- **December 2024:** establishing contact, explaining the project, introducing DRGs, and identifying local needs.
- **March 2025:** conducting interviews, piloting traceability data collection, and co-creating a shared privacy statement.

Fieldwork was conducted with Hacienda San José and UNOCACE, two partners representing different parts of the value chain.

Annex I and II provide the original Spanish consent form and the co-created privacy statement, along with references to Cacao-Tech's privacy and security documents.

3. Field Realities and Cultural Context

Cacao communities in Ecuador are built on familiarity and mutual support. Relationships often span generations. Information travels through trusted intermediaries, and cooperation depends on reputation.

Foreign researchers are welcomed respectfully but must earn trust over time. Small gestures — returning to share results, acknowledging people's time, or including them in decisions — matter more than formal agreements.

Written documents, especially those using unfamiliar legal terms, can create distance. Trust is shown through presence, consistency, and shared purpose. These insights shaped how we approached both consent and communication.

4. Initial Approach and Challenges

Before the first field trip, the team prepared a formal consent form aligned with European research ethics. It was translated into Spanish and shared with cooperatives in advance, with the idea that everyone would sign before interviews began.

This approach did not work. Many did not respond, while others agreed but never returned the forms. When the team brought printed copies to interviews, it created hesitation. Some participants signed without understanding the document; others chose not to.

The process made interactions feel formal and distant. For local partners who were used to working through dialogue, the emphasis on signatures felt unnecessary. Inside the project team, it also caused tension. Relationships that had taken years to build were suddenly under strain.

This experience showed that compliance alone does not create trust. Instead, it can unintentionally signal mistrust.

5. Turning Point: Co-Created Consent Model

After reflecting as a team, we discussed these challenges with our partners San José and UNOCACE. Together, we decided to organize an open meeting to review what had gone wrong and how to move forward.

We first listened. We spoke about what did not feel right with the consent forms and what kind of process would make sense locally. We also consulted a trusted contact who has lived in Ecuador for more than twenty years and understands both European and Ecuadorian contexts. Her perspective helped us adjust our communication and expectations.

During the meeting, held in a quiet space during a local event, we explained the purpose of DRG4FOOD and what digital responsibility means. We used examples from daily life — how data could show the quality of their beans, or how transparency could help them access new buyers.

The tone of the discussion changed. Farmers began asking questions about ownership, storage, and access to information. Together, we defined what felt safe to share and what not.

From this dialogue, a short and bilingual shared privacy statement was created. It replaced the individual consent forms. It explains that data is used only for project purposes, that no personal or location details are published, and that consent can be withdrawn at any time. Cooperative representatives signed once on behalf of their members and confirmed this verbally in later meetings.

The privacy statement also refers to the Chatham House Rule, clarifying that all information shared during meetings remains confidential and is never linked to names or organizations.

This new approach restored openness and matched local ways of working. It also aligned fully with the DRG4FOOD principles of fairness, privacy, and agency.

6. Methodology for Building Trust

The co-creation process evolved into a simple but structured approach used in later visits.

Step 1. Listen and reflect

After the first trip, the team reviewed what had gone wrong and what had been misunderstood. We concluded that trust, not paperwork, must come first.

Step 2. Learn from the local context

We studied local research practices and social norms. We also asked advice from a trusted

Dutch contact who has lived in Ecuador for many years. Her guidance helped bridge cultural and communication gaps.

Step 3. Engage partners early

Before returning, we aligned with San José and UNOCACE on the purpose and method. They supported us in organizing open discussions with farmers and cooperative leaders.

Step 4. Create understanding before collecting data

Each visit started with informal conversations about who we are, why we are there, and how the CacaoTech360 and QCTech360 systems work. We used examples from farm life to make the concepts tangible.

Step 5. Discuss fears and expectations

People shared their concerns about the use of photos, about losing control of information, and about how outsiders might interpret data. These conversations helped build transparency.

Step 6. Write and agree together

The privacy statement was drafted based on the meeting outcomes. It was short, clear, and bilingual. Everyone could suggest edits. Wageningen University and CZU reviewed it to ensure it met DRG4FOOD ethical and data-protection standards.

Step 7. Keep the dialogue open

Agreements were revisited after each visit. When something felt uncomfortable or unclear, it was adapted. This made the process flexible and rooted in mutual trust rather than formality.

7. Roles and Enablers

Building trust depended on the right combination of local knowledge, institutional support, and open reflection.

Local knowledge holders

A cultural interpreter and field guide helped the European team read social cues, manage timing, and avoid misunderstandings.

Community leaders

Cooperative representatives from San José and UNOCACE acted as gatekeepers. Their endorsement legitimized each visit and reassured members about data safety.

Translation and accessibility

All materials were bilingual. Spanish versions were prioritized and reviewed for clarity.

Reflexivity tools

The team maintained shared notes on what worked, what caused tension, and how people reacted. These reflections helped adapt our communication and ensure consistency.

Together, these enablers created a method that combined formal responsibility with genuine human connection.

8. Outcomes

The adapted consent model led to measurable improvements:

- **Higher participation** – Once the purpose was understood, farmers were more open to sharing information.
- **Better data quality** – Conversations became richer, revealing more insights about farming practices and local challenges.
- **Shared ownership** – Cooperatives began using the privacy statement as their own tool when introducing Cacao-Tech to new members.
- **Reduced resistance** – No withdrawals of consent occurred after the joint statement was adopted.
- **Replicable framework** – The approach is now included in the DRG4FOOD Toolbox for other projects in informal sectors.

Most importantly, trust grew on both sides. Researchers could collect data responsibly, and farmers could participate with confidence.

9. Lessons Learned

1. Legal tools need cultural translation. A GDPR document alone does not create understanding or trust.
2. Trust comes before transparency. Data sharing starts with relationships, not technology.
3. Co-creation works better than compliance. When people help define the rules, they also own them.
4. Local intermediaries are essential. They bridge not only language but also rhythm, tone, and expectations.
5. Aggregate by default. Show cooperative or regional data, not individual identifiers.
6. Make reflection part of the process. Teams should record cultural and ethical insights, not treat them as side notes.
7. Digital responsibility is social practice. DRGs only gain meaning when applied through real interactions.

Through Cacao-Tech, we learned that digital responsibility begins with human responsibility. When people understand how their data is used and feel respected in that process, technology becomes a tool for empowerment.

References

- Cacao-Tech and Wageningen University & Research (2025). Value Chain Analysis Report. [Link](#).
- Cultural Sensitivity Guidelines for Qualitative Research (2025). [Link](#).

ANNEXES

ANNEX I – Consent form (Spanish)

Formulario de consentimiento



Proyecto Cacao Tech

Información general sobre el proyecto, formulario de consentimiento (Apéndice del Marco Ético) e [Invitación](#) a participar en la [reunión](#) en línea

Información general sobre el proyecto Cacao-Tech

Los granos de cacao, ingrediente clave en la producción de chocolate, constituyen solo el 20% del fruto del cacao, mientras que la pulpa (30%) y la vaina (50%) suelen desecharse en las cadenas de suministro tradicionales. Cacao-Tech está desarrollando una cadena de valor circular para los productos del cacao utilizando vainas enteras de cacao, valorizando los flujos de residuos y las nuevas tecnologías de calidad y recopilación de datos.

¿Por qué recogemos y utilizamos sus datos?

Muchos agricultores de cacao de América Latina siguen enfrentándose a retos relacionados con la producción de baja calidad, la transparencia limitada y las prácticas derrochadoras en la cadena de valor del cacao. Al unirse a nuestros esfuerzos de colaboración, nos ayudará a reunir información valiosa sobre cómo la tecnología NIR, el procesamiento automatizado y los sistemas de trazabilidad pueden mejorar la calidad del cacao, reducir los residuos y crear medios de vida sostenibles para los agricultores. Su valioso apoyo ayudará al equipo de Cacao-Tech, un proyecto destinado a mejorar la cadena de valor del cacao, mientras desarrollamos soluciones tecnológicas innovadoras adaptadas a sus necesidades y contexto específicos. Su aportación desempeñará un papel crucial en la configuración de una industria del cacao más transparente, eficiente y sostenible para el futuro.

El proyecto Cacao-Tech ha recibido financiación indirecta del programa de acción de investigación e innovación Horizonte Europa de la Unión Europea, a través de la convocatoria DRG4FOOD - Open Call #2 publicada y ejecutada en el marco del proyecto DRG4FOOD (Acuerdo de subvención n° 501086523).



Formulario de consentimiento**La entrevista**

Estamos planeando una entrevista de 45 minutos para discutir los objetivos de nuestros proyectos y nuestras principales preguntas sobre las relaciones de la cadena de valor, el valor de los productos de cacao y los productos de datos y el estado de la actual infraestructura de datos en el cacao. Durante la sesión, trataremos temas como el proceso de producción del cacao, la toma de decisiones de los compradores, las certificaciones, la cadena de valor, los procesos de datos, la sostenibilidad, etc. A la sesión asistirán representantes de [Pacha de Cacao](#), [CZU](#) y [WUR](#).

Protección de datos

Los resultados de esta entrevista, y de las siguientes, son anónimos, y todos los datos facilitados se utilizarán exclusivamente con fines de investigación, con estricta confidencialidad. La información recogida en los cuestionarios será anonimizada para garantizar la protección de la identidad de los encuestados y que no puedan extraerse conclusiones personales. Los datos se conservarán durante diez años tras la finalización del proyecto [Cacao-Tech](#).

Declaración de consentimiento

Al seleccionar la casilla "Acepto participar en este estudio", confirma lo siguiente:

- He leído y comprendido la información sobre este estudio, y reconozco que mi participación es voluntaria.
- Entiendo que puedo retirarme de cualquier reunión o entrevista en cualquier momento.
- Reconozco que mis respuestas permanecerán anónimas y que no se incluirá ningún dato personal identificable en ningún informe o artículo relacionado con este estudio, a menos que así se acuerde con el equipo de [Cacao-Tech](#).
- Entiendo que el equipo de [Cacao-Tech](#) podrá tomar fotos durante la visita y grabar algunas respuestas durante los talleres.
- Entiendo que la entrevista y todas las reuniones se celebran bajo la Chatham House: "Cuando una reunión o entrevista, o parte de ella, se celebre bajo la Regla de Chatham House, los participantes son libres de utilizar la información recibida, pero no podrán revelarse ni la identidad ni la afiliación del orador u oradores, ni la de ningún otro participante." [Regla de Chatham House](#) | [Chatham House - International Affairs Think Tank](#)

Doy mi consentimiento para el tratamiento de mis datos personales tal como se indica en el documento de consentimiento informado y declaro que:



- Tengo 18 años o más y soy capaz de dar mi consentimiento.
- He revisado el documento de consentimiento informado, que explica el estudio, los objetivos del proyecto [Cacao-Tech](#) y cómo se tratarán mis datos.
- Acepto voluntariamente participar en este estudio de investigación, sin que ello afecte a mis derechos legales o éticos.
- Entiendo que puedo saltarme cualquier pregunta y que puedo retirarme en cualquier momento sin sufrir ninguna consecuencia.
- Acepto que mis datos se utilicen para publicaciones científicas e informes de proyectos de forma que no se revele mi identidad.
- Reconozco que mi participación es totalmente anónima y que toda la información que facilite será confidencial.

Al firmar, acepta los puntos mencionados.

Fecha y lugar

Su nombre

Su firma

Cómo ponerse en contacto con nosotros

Si tiene alguna pregunta sobre esta encuesta, el tratamiento de sus datos o el proyecto [Cacao-Tech](#), no dude en ponerse en contacto con marika@pachadecacao.com.

Gracias.



ANNEX II - Cacao-Tech (2025). Privacy and Security Statement (English).



Funded by
the European Union



Data privacy and security statement

| | |
|---------------------|------------|
| Document ID | Version 1 |
| Today's date | 26/02/2025 |
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| Dissemination level | Public |
| Work Package | WP 1 |

The Cacao-Tech project has indirectly received funding from the European Union's Horizon Europe research and innovation action programme, via the DRG4FOOD - Open Call #2 issued and executed under the DRG4FOOD project (Grant Agreement no. 101086523).

Privacy and Security statement for targeted consultation of experts, farmers, processors and retailers.

Protection of your personal data:

Means of research: targeted consultation activities including surveys, [interviews](#) and focus group discussion.

Data processors: Pacha de Cacao, Czech University of Life Sciences, Wageningen Research and Vanilla Gorilla.

Introduction: Cacao-Tech is part of DRG4FOOD, a project on the digital responsible use of data, funded by the European Commission. As [such](#) we are committed to [protect](#) your personal data and [secure](#) any information we have gotten. Cacao-Tech processes data in line with the [WUR Smart PIA for GDPR compliance](#) and the Regulation (EU) 2018/1725 of the European Parliament and of the Council of 23 October 2018 on the protection of natural persons with regard to the processing of personal data by the Union institutions, bodies, offices and agencies and on the free movement of such data (repealing Regulation (EC) No 45/2001).

This statement explains the reasons for processing your personal data, and the way we collect, [handle](#) and ensure protection of all personal data provided.

Why and how do we process your personal data?

Cacao-Tech collects data for the purpose of developing a quality enhanced and traced transparent whole pod cacao process. The scope of data collection is restricted to the purpose of obtaining views on specific aspects of the cacao value



General information about the Cacao-Tech project

Cacao-Tech improves cacao quality, introduces tracking/tracing [system](#) and valorizes additional products from cacao pods, while reducing waste.

We operationalize a circular data-driven model that uses whole cacao pods and valorizes waste streams (pulp and husks). We deploy [NIR-technology](#) to assess produce quality and establish tracking/tracing system to create a circular value chain (VC) with high quality products. Cacao-Tech tests these technologies in three major cacao-producing regions in Ecuador and is scalable globally through an open-source licensing model.

Cacao-Tech resolves the lack of control over cacao quality and adds incentives for quality and cacao component separation that has long frustrated the industry. The industry will be able to trace the cacao origins to adhere to the European Deforestation Regulation. Introducing traceability and valorizing waste streams creates opportunities across VC.

Currently, only 20% (the beans) are used commercially. Utilizing the pulp reduces waste by 30% and offers a nutritious ingredient for beverages, while the husks can be converted into organic fertilizer. This circular approach to cacao processing could transform 22Mt of waste into high-value products with a potential commercial value of €302 M.

Your valuable support will help the Cacao-Tech team, a project aimed at enhancing the cacao value chain, as we develop innovative technological solutions tailored to your specific needs and context. Your input will play a crucial role in shaping a more transparent, efficient, and sustainable cacao industry for the future.



- The final application will store data securely at google cloud platform and inventories and monitor all risks on a regular basis.
- The application will become available based on a licensing system providing data on cacao quality and the origin of the cacao from the point of processing. Other attributes can be added depending on the data consent (data train).

Which personal and other [type](#) of data do we collect?

Data that will be processed includes personal data necessary to receive responses and to make the data subject identifiable.

- Name and surname
- Profession
- The name of the organization the person is contributing for
- Country of residence
- Email address and WhatsApp numbers
- The name of a self-employed individual in case the company does not state a statutory name.
- Photos, [audios](#) and video recordings taken during [the interviews](#) and visits.
- Cacao [produce](#) quantity, quality and their pictures.

[Furthermore](#) the Chatham house rule for information sharing apply: [Chatham House Rule | Chatham House - International Affairs Think Tank](#). This rule reads as follows: "When a meeting or part thereof, is held under the Chatham House Rule, participants are free to use the information received, but neither the identity nor the affiliation of the speakers, nor that of any other participant may be revealed."

Furthermore, you may at any point spontaneously provide other, non-requested personal data or [piece](#) of information in the context of your reply to the targeted consultation.

How long do we keep your data?



Consent Form

Data is kept only for the time necessary to fulfill the purpose of the project and to a maximum of 3 years. No other information will be disclosed than the information provided in the publicly provided documents under the open research policy of the European Union.

How do we protect and safeguard your personal data?

All personal data in electronic format (e-mails, documents, databases, uploaded batches, lots or quality of cacao information) are stored on the WR Teams server or the CZU Teams server. Both universities have [organizations](#) measures in place to protect your data. In addition, the project team put a number of technical measures in place, such as restricting access to information on the drive, actions to address online security, risk of data loss, or alteration of data.

Who has access to your data?

Access to the data is only given to those people that are responsible for carrying out [the research](#) and project work.

Certain data may be made public on the EU website:

- Any personal data such as names of authors that [consented](#) to the publication of their names.
- Personal data spontaneously provided, e.g. visual material of cacao plants.

Otherwise, information collected outside of the reporting obligations to DRG4FOOD, and the EU Commission will not be given to any third party.

What are your rights?

You have specific rights as a 'data subject' under Chapter III (Articles 14-25) of Regulation (EU) 2018/1725, in particular the right to access your personal data and to rectify them in case your personal data [are](#) inaccurate or incomplete. Under certain conditions, you have the right to erase your personal data, [to restrict](#) the processing of your personal data, [to object](#) to the [processing](#) and the right to data portability.



Consent Form

chain to assess the value that can be added [for](#) the VC partners. This targeted intervention is carried out under the EU contract: DRG4FOOD – Open Call #2 [Horizon-CL6-2022-Governance-01-10] Project # 101086523 Annex B Grant Agreement. The terms of this contract require the Cacao-Tech team to treat all information and documents associated with personal data as confidential. At any [moment in time](#) this information can be deleted on request (Marika@pachade cacao.com). The collected data can only be used for the purpose of developing an open-source licensed quality and traceability system, in particular:

Data Protection

The results of these surveys, expert opinions and interviews, and [the ones following](#), are anonymous, and all data provided will be used exclusively for research purposes. The information gathered will be anonymized to ensure the respondents' identity is protected and that no personal or business-related conclusions can be made. The data will be stored for 3 years following the completion of the Cacao-Tech Project.

The information collected will be used:

- To design, evaluate and revise the data flow within the cacao quality and traceability application and the whole pod processing. Where possible, realistic fictive data will be used to protect the business relationships and personal data of the [involved participants](#).
- To obtain the views of stakeholders to explore a new subject for which limited data and information is available. This information is used to develop the strategic direction of the final product and to ensure its usability and value.
- To test and determine quality treats of the cacao plant that can help us to identify and produce high quality cacao products.

Data security:



Consent Form



You have the right to object to the processing of your personal data, which is lawfully carried out pursuant to Article 5(1)(a), on grounds relating to your particular situation.

If consent to the certain processing of your personal data for the present processing operation, you can withdraw your consent at any time by notifying marika@pachadecacao.com. The withdrawal will not affect the lawfulness of the processing carried out before you have withdrawn the consent.

