



ENHANCING COMPETITIVENESS OF COFFEE GROWERS IN ITUANGO, COLOMBIA, THROUGH SCIENCE, TECHNOLOGY, AND INNOVATION: "THE COFFEE GROWER'S LABORATORY INITIATIVE"

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**UNIVERSIDAD
DE ANTIOQUIA**

Facultad de Ciencias
Farmacéuticas y Alimentarias

INTERNATIONAL COFFEE CONVENTION 2024



ASYMMETRIES IN THE GLOBAL COFFEE CHAIN

PRODUCER COUNTRIES

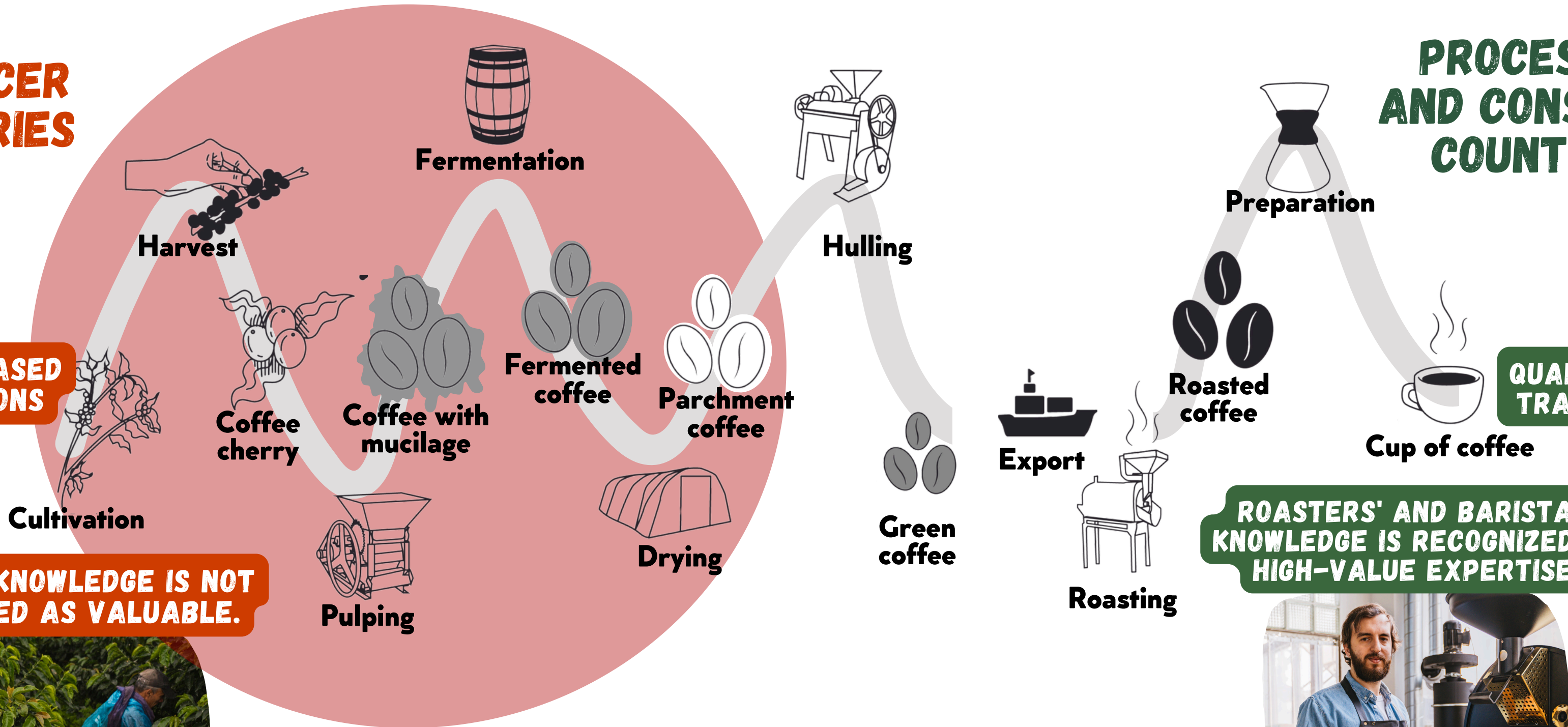
PROCESSING AND CONSUMING COUNTRIES

QUANTITY-BASED TRANSACTIONS

QUALITY-BASED TRANSACTIONS

FARMERS' KNOWLEDGE IS NOT RECOGNIZED AS VALUABLE.

ROASTERS' AND BARISTAS' KNOWLEDGE IS RECOGNIZED AS HIGH-VALUE EXPERTISE.



Original work. Based on Coffee Barometer by Panhuysen and Pierrot 2020

Green coffee price volatility

Limited access to insurance and hedging instruments

Long-term decline in real coffee prices

Lack of market information

Lack of product information

Uncertainty in land tenure

Currency exchange volatility

Increasing living costs

Aging coffee trees

Poor services through local or farmer organization

No dignified income

Economic



Food insecurity

Malnutrition

Lack of adequate institutions and governance

Lack of retirement pension

Gender inequality

Aging farming community

Migration and youth leaving coffee farming

Poor access to education and healthcare

Lack of communal social leadership

Social



Environmental

Inappropriate use of agrochemicals Deterioration of water quality and supply

Climate change and volatility

Erosion and soil degradation

Deforestation

Biodiversity loss

Limited management of wastewater

Evolving coffee pests and diseases

Quiñones-Ruiz, X. F. (2021). Social brokerage: Encounters between Colombian coffee producers and Austrian buyers—A research-based relational pathway. *Geoforum*, 123, 107-116.



El conocimiento es de todos

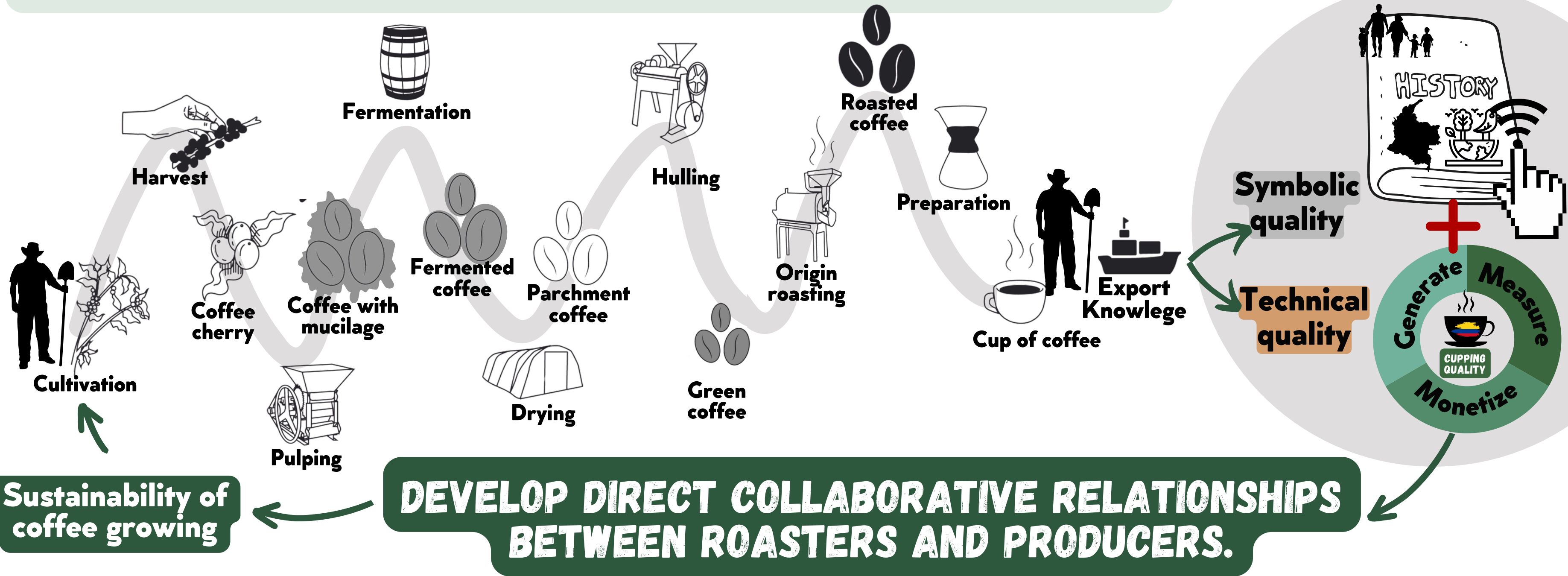
Minciencias



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REDUCTION OF ASYMMETRIES IN THE GLOBAL COFFEE CHAIN



Original work. Based on Panhuysen, S. and Pierrot, J. (2020): Coffee Barometer 2020.

Samper, L. F., & Quiñones-Ruiz, X. F. (2017). Towards a balanced sustainability vision for the coffee industry. Resources, 6(2), 17.

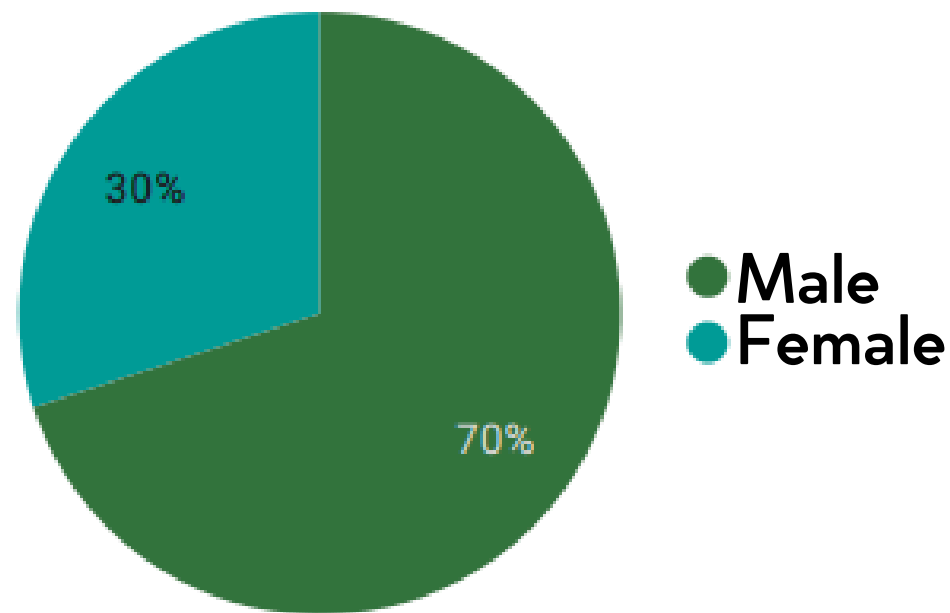
IMPACTED POPULATION



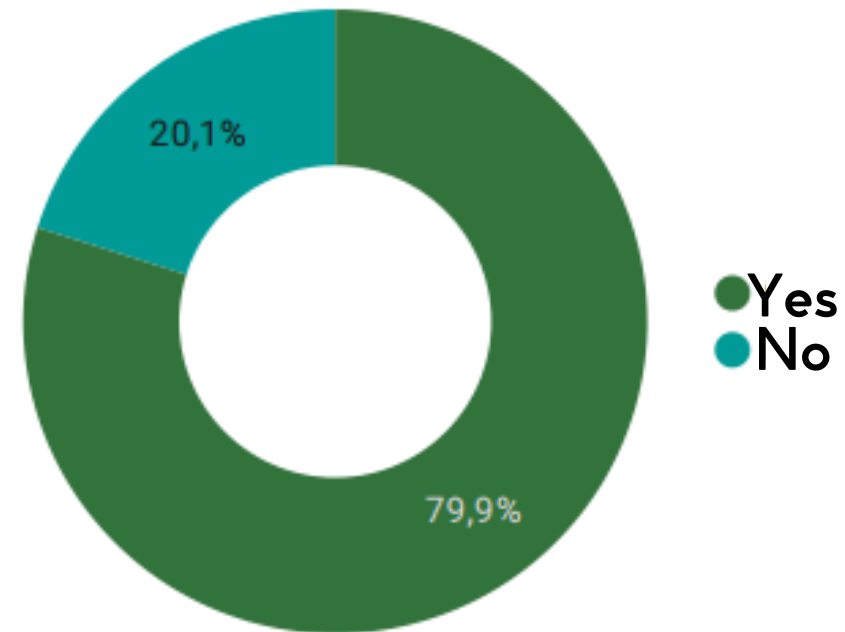
El cedral	La honda	Los galgos
Santa lucía	Guacharaquero	Buenavista
El quindío	El tinto	Paloblanco
La florida	La hundida	Cortaderal
	El naranjo	



Gender



Victim of the armed conflict?



302 COFFEE GROWERS PARTICIPATED



INTERDISCIPLINARY TEAM



1. Anthropologists
2. Pedagogy professionals, visual artist
3. Master's in Education
4. Business administration
5. Food engineer
6. Chemists
7. Pharmaceutical Chemists,
8. Master's in Science, Technology, and Innovation Management
9. Agricultural Technicians,
10. Accountant Occupational Health Technician.



LABORATORIO
DEL
CAFICULTOR



ON THE FARM



THE COFFEE GROWER'S LABORATORY

Laboratorio
del caficultor



1

HULLING



2

SIZE AND DEFECTS
SELECTION



3

ROASTING



4

GRINDING AND
BARISTA
TECHNIQUES



5

CUPPING

The coffee grower's lab was created as a training space for the coffee growers of Ituango, with the aim of helping them understand the technical and symbolic quality of the coffee they produce. This will enable them to establish more assertive relationships with national and international buyers in the future.

COOPERATIVE ECOSYSTEM WAS FUNDAMENTAL.

Space



Technological tools and capacity building



Locational adaptations



The Council of Ituango



International Committee of the Red Cross (ICRC)

MEMORIES OF THE BODY



"THIS IS THE BODY THAT KNOWS ABOUT COFFEE."

In a silhouette of the human body, the coffee growers illustrated the knowledge each part of the body holds about coffee.

The precise art of coffee drying



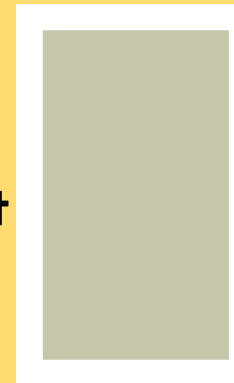
SOUND

They turn over the coffee on the drying patio with a rake or by hand. They explain that the coffee is wet when it makes no sound and, when it's dry, it produces a crunchy sound.



COLOR

They observe that the wet bean displays a light green color that transforms to a cement green like RGB (195,198,168)



HARDNESS

They measure the hardness by biting the almond, a technique they call "dentimeter". If it's crunchy, it's still dry..

RECOVERY OF THE DEEP COFFEE MEMORY



This methodology seeks to recover ancestral knowledge and family traditions surrounding coffee and coffee culture, transmitted verbally among families through the presentation of images, photographs, and related objects.

Martínez Castaño, M. ., Quirama Rivera, M. A., Sánchez-Betancur, G., Rojas Gallardo, J., Gómez Quintero, D. J., Estrada Cano, W. de J. ., Gallardo Cabrera, C., & Perez Perez, L. E. (2024). Formation in coffee production: knowledge from the Coffee Farms of Ituango. *Plumilla Educativa*, 33(1), 1-20.

COFFEE TRANSFORMATION LAB SESSION IN RURAL COMMUNITIES



Methods of coffee preparation

Cupping

Roasting

ROAST CURVE



METHODOLOGIES FOR DEVELOPING COMPETENCIES IN EVALUATING COFFEE CUPPING QUALITY IN RURAL COMMUNITIES

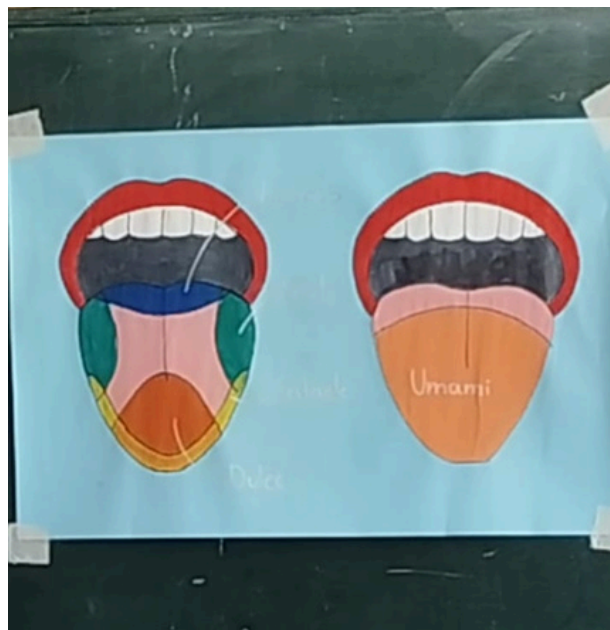
Workshop: Sensory wheel

Sensory memory identifying aromas and fragrances of coffee.



Workshop: Taste map

Taste recognition on the tongue.



"Pasilla coffee" vs "Specialty coffee"

We conducted a comparison among different coffee qualities.



Recognizing the acids present in coffee

The use of fruits and acidic water solutions allowed us to identify the acids that could be present in coffee

KNOW THE BEAN

Day/Month/Year



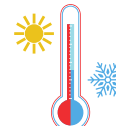
Washed
Natural
Honey
Other process



Day/Month/Year



# Lote	Review Date	Parchment Coffee Moisture	Parchment Weight	Coffee Variety	Coffee Farmer's Name	Mesh Size	Processing Method	Fermentation Time	Harvest Date



$$YF = \frac{250g \text{ parchment coffee} * 70Kg}{g \text{ excelso coffee}}$$

% Green Coffee Moisture	Weight in Beaker	Beaker Volume	Density = Weight ÷ Volume	Laboratory Moisture	Laboratory Temperature	*Yield Factor (YF)

* The amount of dry parchment coffee needed to obtain a 70kg bag of Excelso coffee is approximately 100kg. This accounts for the weight loss during hulling and processing to remove the parchment layer.

The coffee farmers engaged with quality measures in green coffee, seeking to understand their impact on the final cup quality. This was done through the use of formats they learned to fill out, the use of instruments to measure these parameters, and repeated practice exercises.



DESIGN THINKING FOR CO-CREATING SCIENTIFIC AND TECHNOLOGICAL SOLUTIONS

The challenge was to create new sensory profiles in coffee



Experience 1



Inspiration

We provided the coffee growers with materials to inspire them in their creations, such as regional fruits and both artisanal and technological processes for food processing.

Experience 2



Co-creation

Afterward, they developed new processes to achieve new sensory profiles in coffee.

Experience 3



Pitch

They later presented their new solutions; some created new profiles in post-harvesting, others in roasting, and others in the final beverage.

CO-CREATION OF SCIENTIFIC AND TECHNOLOGICAL SOLUTIONS



This is how fermentation processes and alternative processing methods such as Honey and Natural drying of coffee have been studied and implemented, aiming to create value-added products through the production of micro-lots of coffee.



Initially, fermentation was carried out in pineapple juice, and kombucha was introduced—a fermented beverage made with yeast strains and microbiota working together to create acidic flavors, fizzy texture, and distinctive tastes through the transformation of a coffee extract. This laid the groundwork for coffee farmers to conduct experiments using the resources available on their farms, including the use of other raw materials.

ARTESANATO. METHODOLOGY FOR DEVELOPING BRAND IDENTITY WITH ACTIVE PARTICIPATION FROM COFFEE GROWERS IN ITUANGO.

Recognition of the feelings, tastes, knowledge, memories, and biodiversity of the Ituango territory.

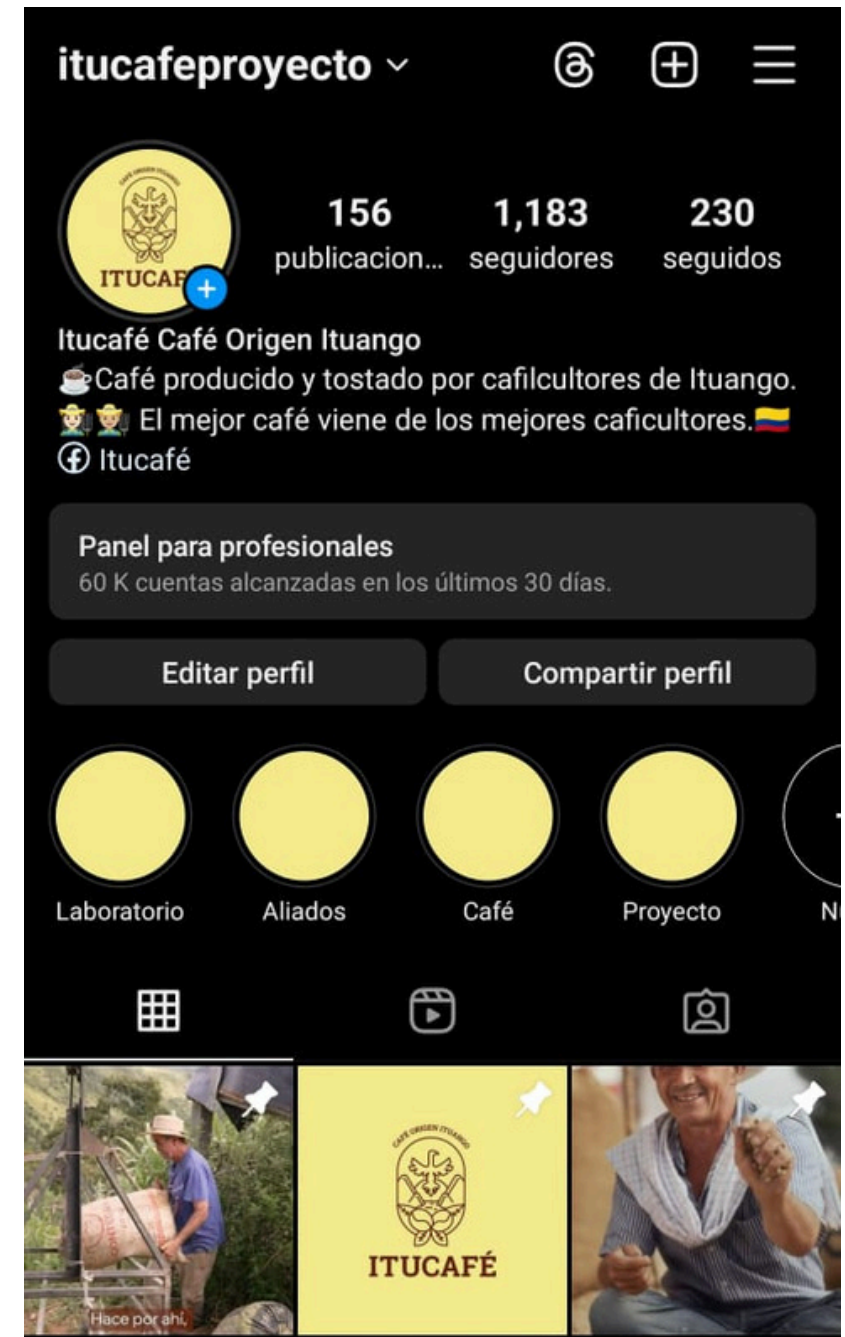
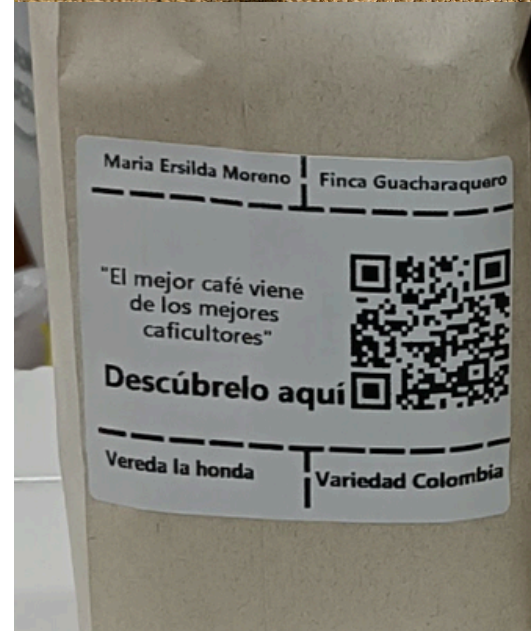


ITUANGO - ANTIOQUIA



ITUCAFÉ

Connection between man and nature, tradition and innovation.



METHODOLOGIES FOR STRENGTHENING INTRA AND INTERPERSONAL SKILLS

Workshop: crossing the river

Consisted of crossing the river strategically with the help of a single person who had a paper boat. They could not touch the fish or cross without directly or indirectly touching the boat.



Workshop: The four pillars of Trust

The activity involved assembling a plastic table first with one leg, then with two, then with three, and finally with four legs. In the end, there was a reflection on building trust, based on four pillars: reliability, competence, commitment, and sincerity.



COFFEE GROWERS USE THE LABORATORY ON THEIR OWN INITIATIVE



The coffee farmers have learned to perform the entire post-harvest coffee process, which includes hulling, size and defects sorting, measurement of green coffee quality aspects, roasting, measurement of roasted coffee quality aspects, grinding, cupping, and barista skills.

COFFEE GROWERS USE THE LABORATORY FOR COMMERCIAL NETWORKING ON THEIR OWN INITIATIVE.



Farmers, who previously sold only washed parchment coffee, now process, taste, and sell their coffee directly to buyers. Selling directly to buyers increased coffee growers' profits to around 50% through the "Coffee Grower's Laboratory", compared to the less than 10% they earned previously



Realizing this project required the collaboration and dedication of our team. We created, developed, and validated innovative methodologies, alongside the rigorous logistical efforts and implementation required. This collective effort transformed our vision into reality, showcasing that with passion, commitment, and teamwork, any challenge can be conquered.





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¡Thank you!