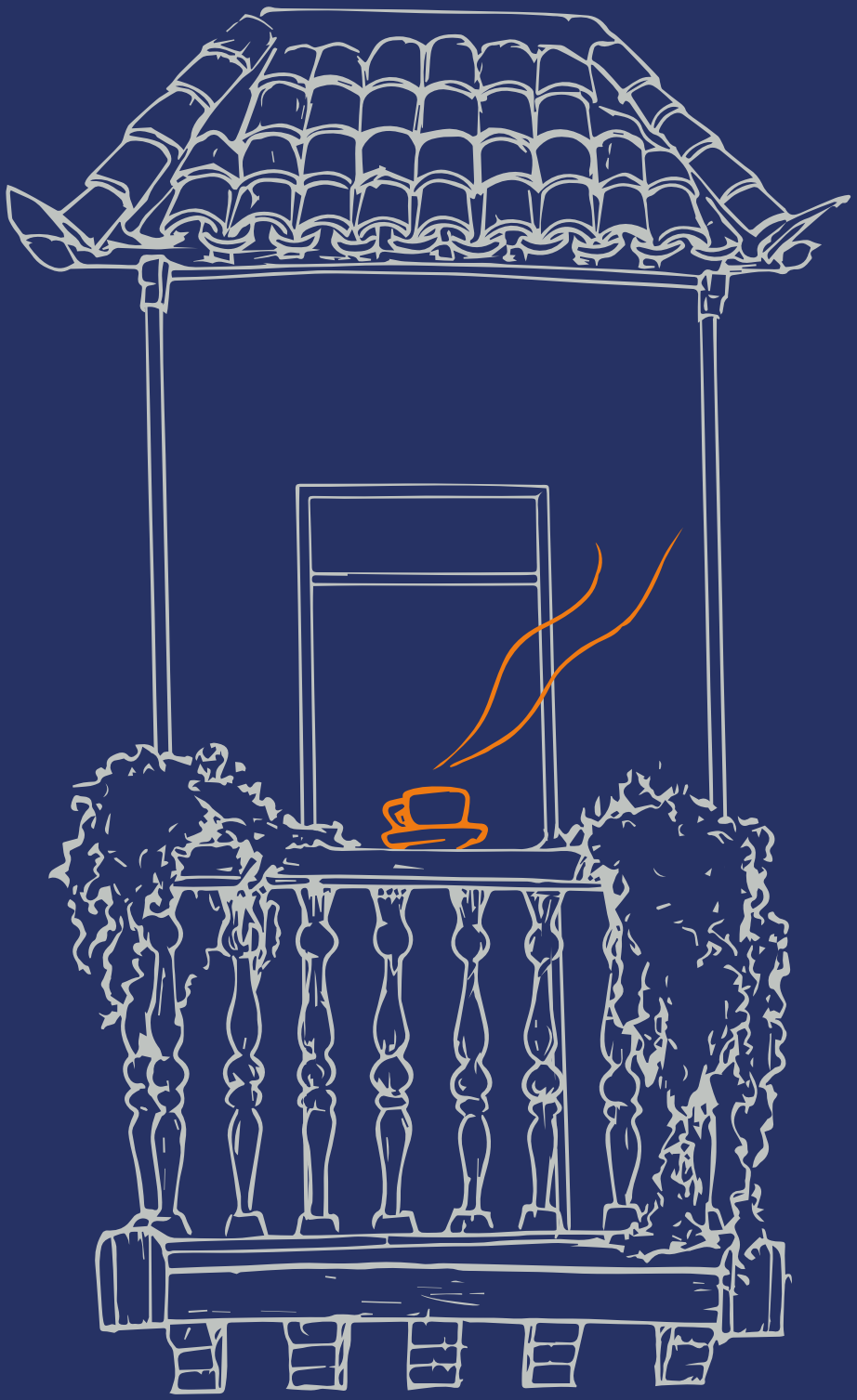
MÁS QUE CAFÉ

A systemic analysis of the Meta coffee sector to Fostering Collaboration, Enhancing Quality, and Promoting Cultural Resilience . The case study of "Tierra " Colombia - Meta project.



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A las viejitas y al Chinche, que caminan siempre a mi lado;
A mi madre, a quien debo todo lo que soy y todo lo que seré...

Con su imagen en mi cabeza y de todo corazón,
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ABSTRACT

What is this about?

Since 2015, the Giuseppe and Pericle Lavazza Foundation Onlus and Fundación Carcafé have been jointly spearheading a sustainability project called ¡Tierra! Colombia - Meta, with the objective of improving the quality and consistency of coffee products in the department of Meta. Más que Café, our project, intends to build upon everything ¡Tierra! Colombia - Meta has created. The project leverages the principles of systemic design to foster collaboration, improve production quality, and promote cultural resilience within coffee-growing communities. By engaging coffee growers and key stakeholders, a holistic framework is developed to address the economic, social, and cultural dimensions of coffee production, with the ultimate goal of creating a thriving and sustainable coffee sector in the department.

The project begins with an in-depth analysis of the current state of the coffee sector in the department of Meta, conducted through extensive research and consultation with industry professionals. This analysis aims to identify the key challenges and opportunities faced by coffee growers and other actors along the value chain. By understanding the complex dynamics and intricacies of the sector, the project can develop targeted strategies that effectively address the identified issues. One of Más que Café's primary objectives is to foster collaboration among coffee growers, industry organizations, government agencies, and other stakeholders. Collaboration is seen as a crucial driver for positive change, as it encourages knowledge sharing, resource pooling, and the collective pursuit of sustainable and inclusive practices. Through workshops, and a collaborative platform, the project facilitates dialogue and cooperation, fostering a sense of shared responsibility and collective action.

Improving production quality is another key focus of the project. By implementing innovative and sustainable production methods, the project seeks to enhance the quality and consistency of local coffee. This not only increases the market desirability of the region's coffee but also ensures the long-term viability of the sector.

Additionally, the project emphasizes the importance of traceability and certification, enabling consumers to make informed choices and supporting fair trade practices. Coffee production is deeply intertwined with the cultural heritage of the coffee-growing communities in the department. The success of the project lies in the recognition and celebration of this cultural connection, aiming to promote the identity, traditions, and values associated with coffee cultivation.

Through these integrated efforts, the strategy aims to create a more sustainable and prosperous departmental coffee sector. By enhancing collaboration, improving production quality, and promoting cultural resilience, the project endeavors to uplift the economic well-being of coffee growers, foster environmental stewardship, and elevate the department of Meta's coffee reputation within national and international markets.

Keywords: systemic design, coffee sector, collaboration, product chain, cultural resilience, sustainability, market recognition, rural development, engagement, Colombia, farming communities.

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INTRO DUCTION

It is no secret that coffee has been a big part of our culture for decades. Excluding water, it is the most popular beverage globally, and its industry is one of the biggest. Coffee has its own universe, it plays a role in pop culture, being the focal point of events, and is popularized by entertainment media. It is difficult to think of someone who hasn't consumed a product derived, completely or partially, from coffee. No matter the country or culture, coffee is a commodity with almost the same availability worldwide as first-need goods like rice, eggs, and fruit. Around 60 million people worldwide make a living by actively participating in the coffee productive chain and market.

70% of the coffee bean supply comes from Latin American countries. Colombia is the third biggest producer worldwide and has maintained a high reputation as one of the main powerhouses in the coffee industry. Due to the climatic conditions required to grow coffee, such as temperature, soil type, and altitude above sea level, Colombia has more than suitable regions to produce a grain of immense commercial value. When speaking of high quality, the mention of Colombian coffee is almost mandatory. However, despite all the advantages that the country has in terms of production, this sector is one of the many cases in which some of the country´s most critical problems arise, as coffee growers particularly face many challenges that prevent a decent development of their productive activity, which affects the quality of life of families that have spent centuries dedicating themselves to coffee growing, but that nevertheless have not

been able to get out of the poverty line that afflicts an immense part of the Colombian people. If the coffee sector's operation is carefully analyzed, several questions arise around the many obstacles that coffee farming families cope with, especially those living in rural areas.

Design methodologies involve identifying ongoing or potential risks within a specific environment and conceiving projects to resolve these risks. Community-focused design research, including rural development, social design, autonomous design, among others, has clearly determined that improving the living and productive conditions of politically, socially and economically marginated groups is an essential contributor to a region's growth and transcendence in a country's economy. However, there are conflicting events and a lack of initiative regarding how best to approach a community and its physical and work environment. Between a series of obstacles which include conflict of interests between stakeholders to even political disputes, the outcome of a design project can be dramatically conditioned, reducing its chances to make a change effectively. Also, the fact that a vast amount of design projects target specific problems or are set to change one particular quality of a context or a group of users implies, at best, a partial solution to the problem, ignoring other aspects which may have an equal or higher impact.

This research aims to study the Colombian coffee sector, particularly rural coffee farming families, and then identify and evaluate systemic strategies and approaches for farming contexts in which introducing sustainable practices and life quality improvement are a priority. This chapter will provide an introduction to the study by first discussing the background and context, followed by the research problem, the research aims, objectives and questions, the significance and finally, its overall limitations.

Enhancing the conditions for productive activity is critically important for worker satisfaction and essentially contributes to business growth (reference). It also allows industries to become more innovative, as the time saved by implementing change can be invested into the application of new technologies, better-suited policies, and improving user experience. Numerous studies have investigated strategies and approaches to help people from rural communities attain new sources of income, improvements in their living spaces and receive orientation on business and entrepreneurship skills (reference). Nonetheless, these studies have traditionally focused on relatively small links in the coffee chain, giving mildly impactful, short-sighted and short-living solutions to specific problems caused by deeper, systemic problems that can affect multiple stages of the industry.

This large amount of theories and case studies present a problem for families who face critical consequences of modifications, due to capital and time investment in the input of partial amends that by the moment they are obsolete, the once mitigated problem not only prevailed but escalated, creating a loop of failure that provoke immense frustration and puts pressure on coffee farmers who, at the end of the day, still have to meet their production quota.

Given the lack of research regarding the coffee sector from a wider perspective, this thesis will aim to identify, through a systemic design methodology, the red flags of the Colombian coffee sector and how it ultimately affects rural families, and then lay out a grounded set of feasible solutions that are not only effective, but that are sustainable through time, preserving the coffee's legacy and culture in Colombia, and setting a precedent to start transforming the sector towards true sustainability in all its meanings. This thesis will contribute to the body of knowledge on sectorial analysis by surfacing and evaluating opportunities and approaches for complex contexts in which social structures, working conditions and infrastructure are rather precarious.

1.1

INVESTIGATION DOMAINS

The first thing to do when trying to change a system is to get to know the system, in this case, the coffee sector in Colombia, and therefore run a deep and rigorous inspection of how it works, which actors interact, and how those interactions are happening. The landscape ahead can be intimidating, not only because of the extensive area to cover, as it will be presented later, but also given the circumstances in which the diagnosis must be made. The bigger the project's scope gets due to the preliminary investigation, the easier it is to fall into ideas sparked by research voids and even prejudice.

Strengthen the links between actors

Rural community development

Sustainable practices

Social design innovation

Systemic design

Life conditions

The safest bet is to establish a blueprint, a research framework that provides a clear route in order to avoid such risk. Determining principal concepts or domains begins to set the soil on which a serious and thorough investigation can happen. These domains should be different enough to be understood independently and, at the same time, close enough to be understood consequentially or cyclically, restricting the threshold of the subject.

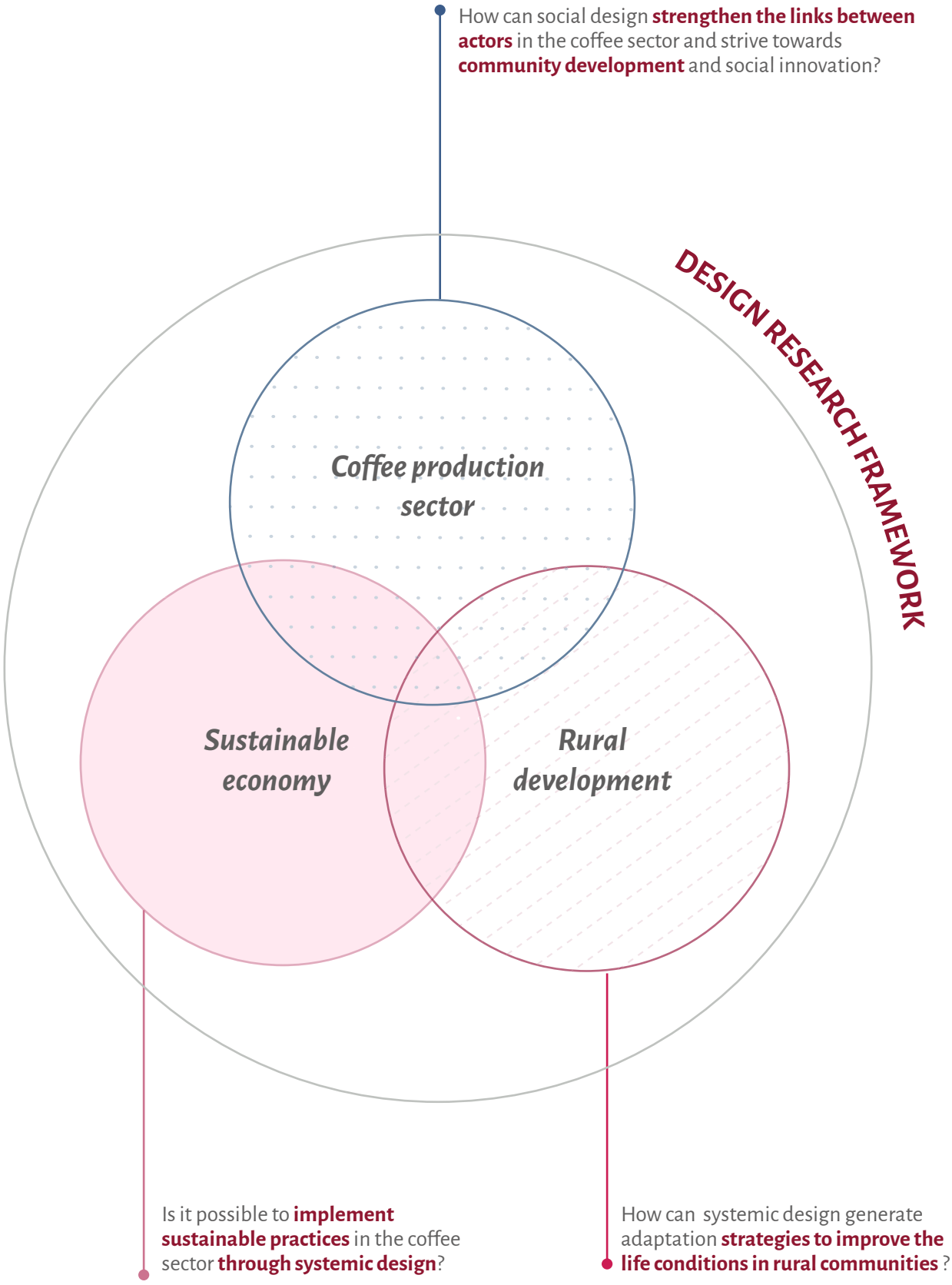


Fig 1. Project investigation domanins

Coffee production sector

the basic subject of study. Being what determines, together with the rural context, the scenario of the project, the Colombian coffee sector is subject to productive, logistic and commercial mechanisms and processes that frame the activity of coffee growers and other stakeholders. Colombia in particular, has a series of entities that govern, supervise and control all phases of coffee in the country. Knowing these entities, their functions, and how they collaborate with each other is critical to building a project that considers that administration and takes it into account in the decision-making process.

Rural development

It is understood as the initiatives conceived and implemented in pursuit of improving the general conditions in which a community lives outside of urban areas. Such initiatives should promote both economic and social development. The coffee community in Colombia is part of a culture that has been rooted in rural areas for generations. Its customs, its tradition and everything that coffee represents beyond a work activity is a value system that cannot be destroyed or irreversibly modified. Respecting the Colombian coffee ethos is essential to improve without losing the identity of the community. In this development, all those agents in charge of maintaining the operation of coffee production, as well as those that regulate the life of coffee growers, will be taken into account.

Sustainable economy

Having as a fundamental objective the introduction of sustainable practices in the sector, it is imperative to study the various mechanisms through which it is possible to maintain productivity while changing the processes with the greatest impact in terms of the environment. It is important to note that sustainability does not only mean the rate of contamination and pollution that an activity entails. Sustainability, for the purposes of this study, implies social equity as well, for which it seeks to reach a point of balance between economic growth, the sector, the preservation of the environment and the quality of life and dignity of the workers.

Having established the domains, and facilitating the overall thought process, the project's objectives are written in question format. These research questions are extremely important, as they dictate the priorities of the insights to search, classify and evaluate, making sure the research is set on the same logical path.

1.2 RESEARCH JOURNEY

Consequently, a path must be traced to figure out the best possible way to approach not only the research but every phase of the thesis. This narrative inquiry should provide a raw sketch of logical steps to be taken in order to progress on the task at hand and maintain focus.

The first phase, Scenario analysis, reclaims the importance of what was stated in the research domains: understanding the setting of the subject matter is crucial before attempting to conceive any possible solutions to a problem. In this respect, two contexts in particular are relevantly identifiable: the coffee market and the rural territories are the fundamental fronts in which the study takes place and in which any proposed exercise has to fit seamlessly Understanding the coffee industry is a vital step.

From the institutional environment to the technology used to grow, extract and treat coffee, through the dynamics of its ever-changing business, to the licensing and certificating procedures, the coffee market is the business in which coffee farmers perform. It dictates where the producers' efforts, economically and from a labor viewpoint, have to point. The coffee sector, like any productive activity, shapes the life and welfare of individual and collective partakers, it molds the behavior, tradition, and relationships of a community just as much as their territory and culture do. Just as important is studying theories around all the concepts that help develop the second context, the rural reality of Colombia, from a strategic standpoint, therefore enlightening the territory, and the people, but also beginning to point out relevant problems from a point of view explained as a mix of design, anthropology, and ethics.

Once the context and state of the art are clear, the Systemic Design analysis phase starts. The research is set on different projects with similar objectives and similar environments. Case studies from around the world are studied to understand how problems and needs are identified in coffee farms of other latitudes, so that in addition to the analysis of the Colombian

Research questions

How can systemic design make sustainable practices more accessible to rural coffee farmers?

Can the coffee legacy be preserved by creating attractive opportunities for the new farming generations?

How can systemic design integrate existing strategies to improve coffee families' life quality and optimize their role in the sector?

Scenario analysis

Coffee market

Development of local communities

Good practices for rural development

Circular economy

SD analysis

Systemic coffee projects - case studies

Capacity building to foster new industries

Circularity projects - case studies

Research outcomes

SD framework

Outcomes

Understand and establish the context of the coffee production sector in Colombian rural territories and state of the art of the productive infrastructure.

Map a new system from a systemic view of how the coffee production sector could work, optimizing alliances, flows and processes in a sustainable way.

Fig 1. Project investigation domanins

context, a complex mapping of the whole coffee production sector is made, highlighting the interactions between stakeholders, the inputs and the outputs of the different junctures within the system. The more complete and detailed this mapping is, the more coherent and safe the proposed solutions are. Having made the diagnosis of the sector, the next thing is to evaluate the points of greatest risk in the system, mainly those that have a greater incidence in the rural coffee context. These challenges facing the project also allow us to establish the opportunities and potential areas of intervention. This identification of opportunities then goes through an evaluation according to criteria defined by the team which allows for assessing each and every idea, combining a qualitative and a quantitative inspection. The higher-ranked opportunities become the premises of the design proposal. The Implementation & conclusion phase begins when the project's framework is defined and the system intervention is mapped and planned, the next step is to outline a method to analyze the outcomes of the project.

Implementation & conclusion

Systemic project for rural development

Analysis of the results

Establishment of a detailed project in the framework of sustainable practices and circular dynamics in the coffee sector.

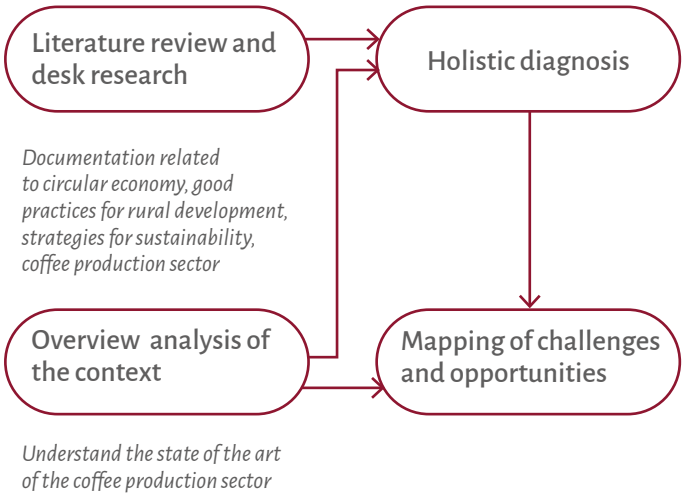
1.3 RESEARCH+ CASE STUDY

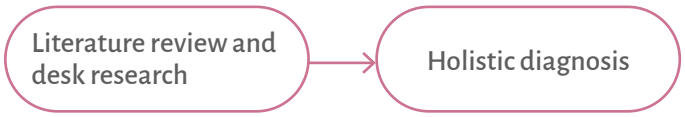
The limitations of developing a project proposal under the conditions previously described will be analyzed to determine the degree of similarity between the objectives of the project and the objectives of this thesis. The case study will be subjected to rigorous analysis to determine the degree of similarity between the objectives of the case study and the objectives of this thesis.

Selecting a case study allows two main things; firstly, it allows to consolidate a realistic basis for the implementation of the final proposal, which would be adjusted to the current state of the analyzed project; secondly, it serves as a basis for the implementation of the final proposal, which would be adjusted to the current state of the analyzed project; on the other hand, it serves as a basis for the implementation of the final proposal. Taking into account the difficulty of implementing a project of this magnitude from scratch and knowing that the territory has its limitations in terms of accessibility by a work team, the most effective way to create a change in the rural coffee sector is, to begin with an already positioned exercise in the territory and that has established channels of communication and feedback with the coffee growers in rural areas. The case study is coupled to the research phases as the main focus of the territorial analysis and all the design concepts and complementary documentation to the research should be aligned with the conditions of this. Once the holistic diagnosis is completed, it will be the scenario for developing the pilot strategy of the proposal. In the same way, what has already been achieved in the case study feeds the final proposal based on its results and future projections.

Scenario analysis

SD analysis





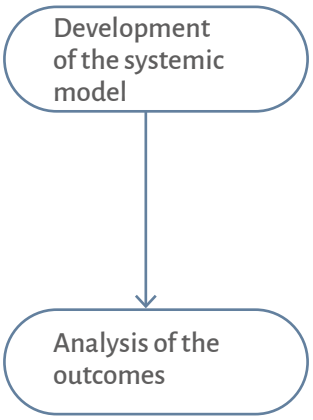
Expected results

Understand and establish the context of the coffee production sector in Colombian rural territories and state of the art of the productive infrastructure.

Understand and establish the context of the coffee production sector in Colombian rural territories and state of the art of the productive infrastructure.

Fig 3. Research+ Case Study

Implementation & conclusion



Establishment of a detailed project in the framework of sustainable practices and circular dynamics in the coffee sector.

1.4 LITERATURE REVIEW

In this methodology, the literature review is the guide to the analysis to be done, a visual guideline to keep track of research topics, and organizing them in a sequential structure. This step-by-step approach is critical to tracking the different blocks of subjects that have been identified within each theme described previously in the research journey. In this manner, the direction of the project takes shape through the different stages of its development; it also facilitates decision-making, as it grants anyone to see the logical order in which ideas come out, according to the succession of topics and the study of research material.

This tool benefits both the team and the project. Firstly, it enables researchers to make informed decisions regarding selecting appropriate research methods and tools that align with the project's objectives and contribute to the validity and rigor of the findings. Considering the human element of the thesis, centered around a community that has been historically margined, precision is an obligation when conceiving a game plan to improve their all-around life conditions. Regarding the conception of ideas, a literature review allows identifying gaps in the existing documentation and case studies, so as to feed the research with potential methods, results, and analytical insights which may function as tools to ensure the best possible outcomes in the project framework. What has been done before and what has and hasn't worked in other contexts, both different and similar, supplies strategies to collect information that's reliable and verifiable, something which has an enormous impact in the viability of a project and therefore its implementation, and its realization. The same applies to methods to maintain the project through time.

The literature review is always changing. As the research goes and decisions are made based on the constant evaluation of the main objectives, the study subjects that were set at the beginning are not the same by the end of the investigation. In this case, the methodologies and design principles taken into consideration varied, since the final case study was chosen during the research process; the analysis of the case study concluded that the methodologies (which will be explained in further chapters) on which the project was initially intended to inspire from, were non exactly in sync with the peculiarities of the specific system.

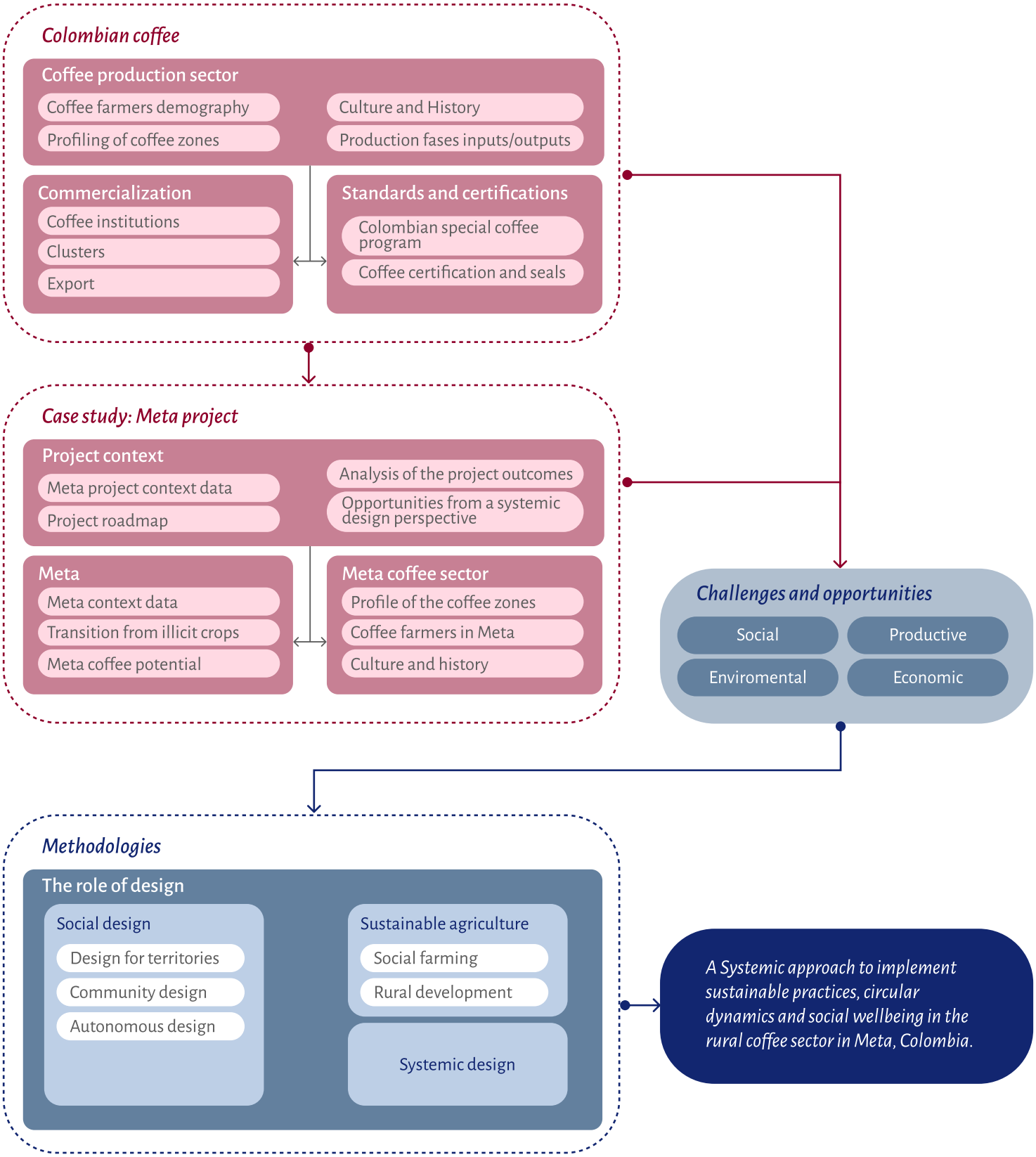


Fig 4. Project Literature Review

02

Research framework

2.1 Theoretical framework and the role of design

2.2 Design factors baseline

2.1 THEORICAL FRAMEWORK AND THE ROLE OF DESIGN

When dealing with communities, and in particular, the rural coffee farming families, design plays a critical role in promoting informed decision-making processes based on logic and analysis rather than bias or disinformation. Design converges several disciplines like anthropology, business management, product development, experience design, etc. This multidisciplinary approach allows for a thorough grasp of the context's situation and the sector's intricacies. Furthermore, design actively incorporates the ultimate users, ensuring that their perspectives and demands are integral to the project's development at all stages. Through community engagement, design may represent their beliefs, honor their symbols, and embrace their cultural history while implementing required adjustments to solve key challenges. This inclusive approach develops a sense of belonging and encourages the community to actively choose their own destiny. Thus, design is a significant tool in the rural coffee industry, allowing for the construction

of sustainable businesses and overall optimization of life conditions in farmer households.

The integration of multiple design ideas is critical in systemic initiatives aiming at rural community development. These ideas serve as important frameworks, providing distinct viewpoints and approaches for dealing with difficult problems. Projects may tap into a wealth of expertise and context-specific insights by relying on a variety of design ideas, allowing for successful engagement with rural communities. This chapter investigates the value of embracing multiple design ideas, without explicitly identifying them, to influence and build the foundation of systemic programs working with rural communities.

Design theories confer a reliable framework for comprehending and handling the complexities of rural situations. They enable designers and practitioners to collaborate in co-creating customized solutions that meet the requirements and goals of the communities they serve. A systemic project can take a complete approach by incorporating many design theories, addressing the social, cultural, and environmental factors particular to rural areas.

By making an amalgamation of concepts derived from these theories, a powerful proposal can be developed by considering the keys of each referent, which in turn can be complemented with the guidelines of the others. Embracing these design ideas also grants access to a diverse set of techniques, tools, and processes for meaningful interaction with rural communities. This chapter goes into the actual implementation of these theories, demonstrating their transformational potential for supporting sustainable development and increasing the rural life quality.

2.1.1 Design for the territories

Design for the Territories is a cross between material culture studies and industrial and service design. It debates essentially, the role and the responsibility of design towards preserving and enriching the essential values of a territory, starting with its people.

It is important to state that territory in this branch of design is not just intended by a portion of land or a geographical location. Territories are peoples, traditions, sets of values, and behaviors that influence the entire functioning of both land and community. Design is seen as an heteronomic discipline that borrows methods and tools from other disciplines, re-interpreting them, making them its own, and reaching thus autonomy and disciplinary recognition. A tool to increase a territory's identity, reflecting its values and lifestyle through a series of products or product systems.

Italian designer Eleonora Lupo proposes six intervention areas as the main axis of a local development-oriented design project targeted to a specific territory:

- The social entrepreneurial network, develops relationships between actors capable of combining efforts to impulse commercial initiatives and support projects that come from within the community.

- Communication, a principal tool to spread the value that design boosts.

- Cultural heritage, as traditions play a big role in a territory's identity as a whole. Cultural heritage determines

- Community-centered, efforts and solutions to solve the needs of the people are the top priority, even before planning any business model or strategy.

- Co-design, collaboration to effectively reach better results as a mix of different experiences and abilities from inside the community.

- Smart technologies, use problem-solving devices and automize unnecessary steps of daily and productive activities.

Fig 5. Julián Acotto, 2022

"The concept of design culture constitutes a possible center of gravity towards which to converge the specificities of design for the territory: it is a 'humanistic' dimension of design which is no longer understood simply as an order of magnitude of reference for its action, but an element capable of informing with sensitivity and responsibility a system of connections involving places, communities, practices, processes, in a sustainable perspective, capable of expressing identities and peculiarities, in an increasingly interconnected and interdependent society globally, in a necessarily inclusive way and democratic." (Lupo, 2017, p.00).

Coffee farmers would benefit from design for the territories' principles considering the role they would play in developing a systemic project. Their rich baggage o traditions and very particular culture are something to protect but also something to use as the most powerful trait of the project's identity: showing and cherishing the value of coffee farming families is fundamental in order to convince the community of the proposal's potential.

2.1.2 Community design

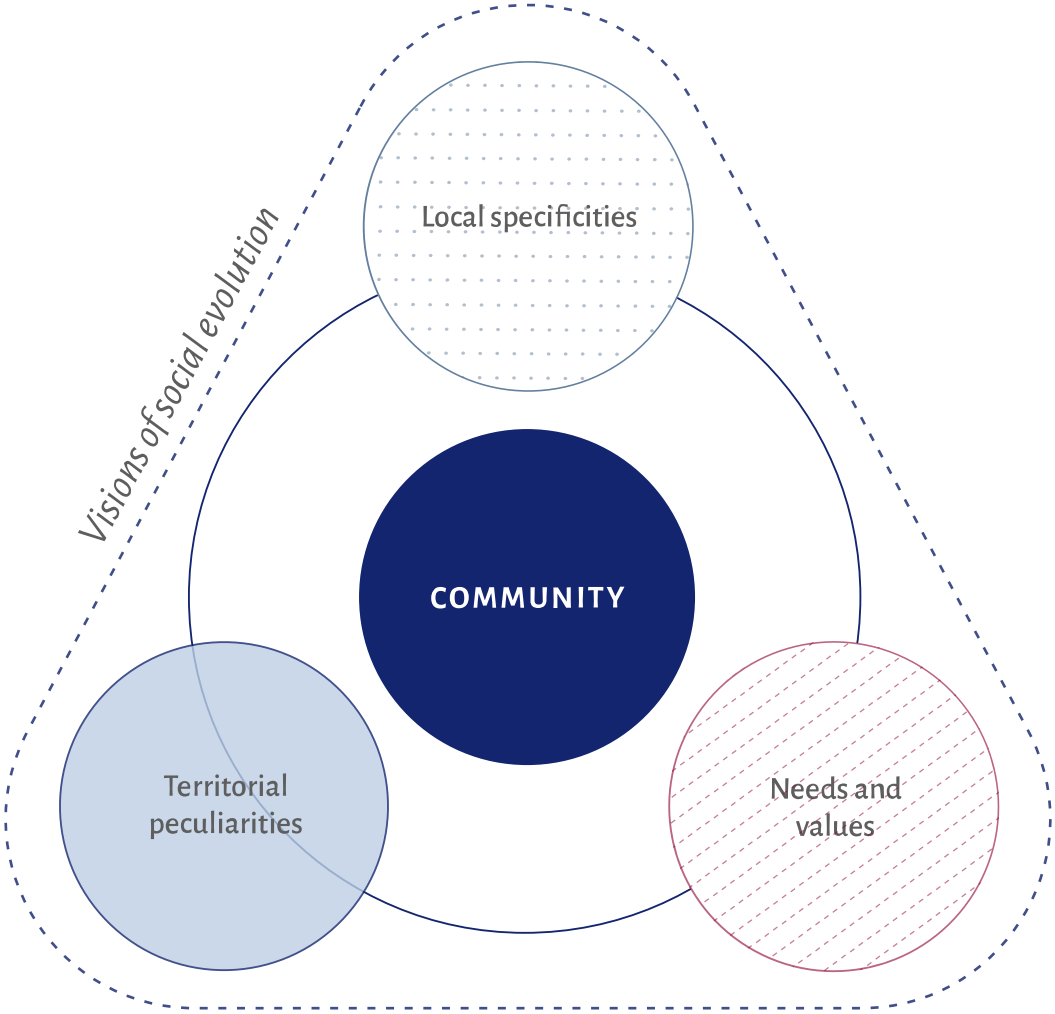
In the planning, development, and transformation of their built environment, communities are actively involved, according to the community design philosophy. It acknowledges the value of group decision-making, sensitivity to cultural differences, and local expertise in forming sustainable and successful communities.

A community's needs, aspirations, and values are included in the planning and development of its physical and social environment through the collaborative process known as community design. To develop practical, inclusive, and expressive spaces of the community's identity, inhabitants, designers, planners, and other stakeholders collaborate. The goals of community design are to strengthen social bonds, empower local communities, and advance environmentally friendly behaviors. Community design promotes community members' active involvement at all phases of the design process. It encourages teamwork, conversation, and group decision-making, ensuring that various views are heard and included.

Design solutions are made more locally relevant, responsive to needs, and consistent with community values by involving the community. This recognizes the value of preserving regional identities and cultural heritage. In order to ensure that the built environment represents the community's distinctive identity and fosters a sense of belonging, it respects and incorporates cultural features, architectural styles, and traditional knowledge.

Sustainable and resilient development strategies are emphasized in community design. In order to design

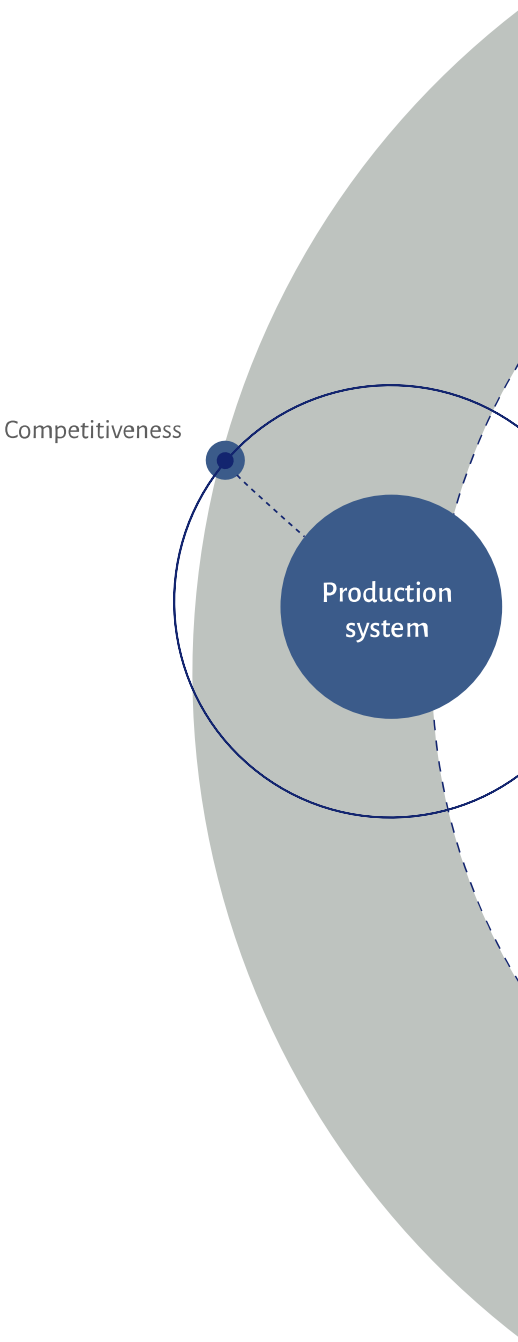
Fig 6. The vision of social evolution from a community design perspective



environments that are both environmentally responsible and flexible to changing conditions, it considers environmental impact, resource efficiency, and climate resilience. To reduce the project's ecological impact, sustainable design components like green infrastructure, renewable energy, and effective water management systems are used.

2.1.3 Social Farming

The idea of social farming has drawn a lot of attention recently as a cutting-edge strategy for rural development. The term "social farming" refers to the practice of leveraging agricultural activities and resources to advance the social, physical, and emotional well-being of weaker members of society or organizations. Social farming tackles societal issues and promotes sustainable development in rural regions by combining the power of farming and community involvement.



By combining social goals with farming activities, social farming marks a departure from conventional agricultural practices. It includes a wide range of programs designed to improve the standard of living for people who are dealing with social, mental, or physical difficulties. These programs may involve therapeutic horticulture, career development, community-supported agriculture, and outdoor pursuits. The fundamental idea behind social farming is to establish welcoming environments where people can engage in meaningful agricultural work and experience purpose, empowerment, and social integration. By addressing several facets of well-being, promoting community resilience, and reviving local economies, social farming plays a crucial role in rural development. First and foremost, social farming promotes the physical and emotional well-being of people who are at risk, such as those who are disabled, have mental health problems, or come from disadvantaged homes. When people work on the farm with a purpose, they gain therapeutic advantages as well as increased self-esteem and a sense of community.

Second, by bridging the divide between rural and urban inhabitants, social farming fosters social inclusion and community cohesion. Social farming encourages intergenerational learning, cultural interchange, and interpersonal understanding by embracing guests, volunteers, and participants from many backgrounds. Within rural communities, these contacts establish social relationships, lessen social isolation, and build a support system.

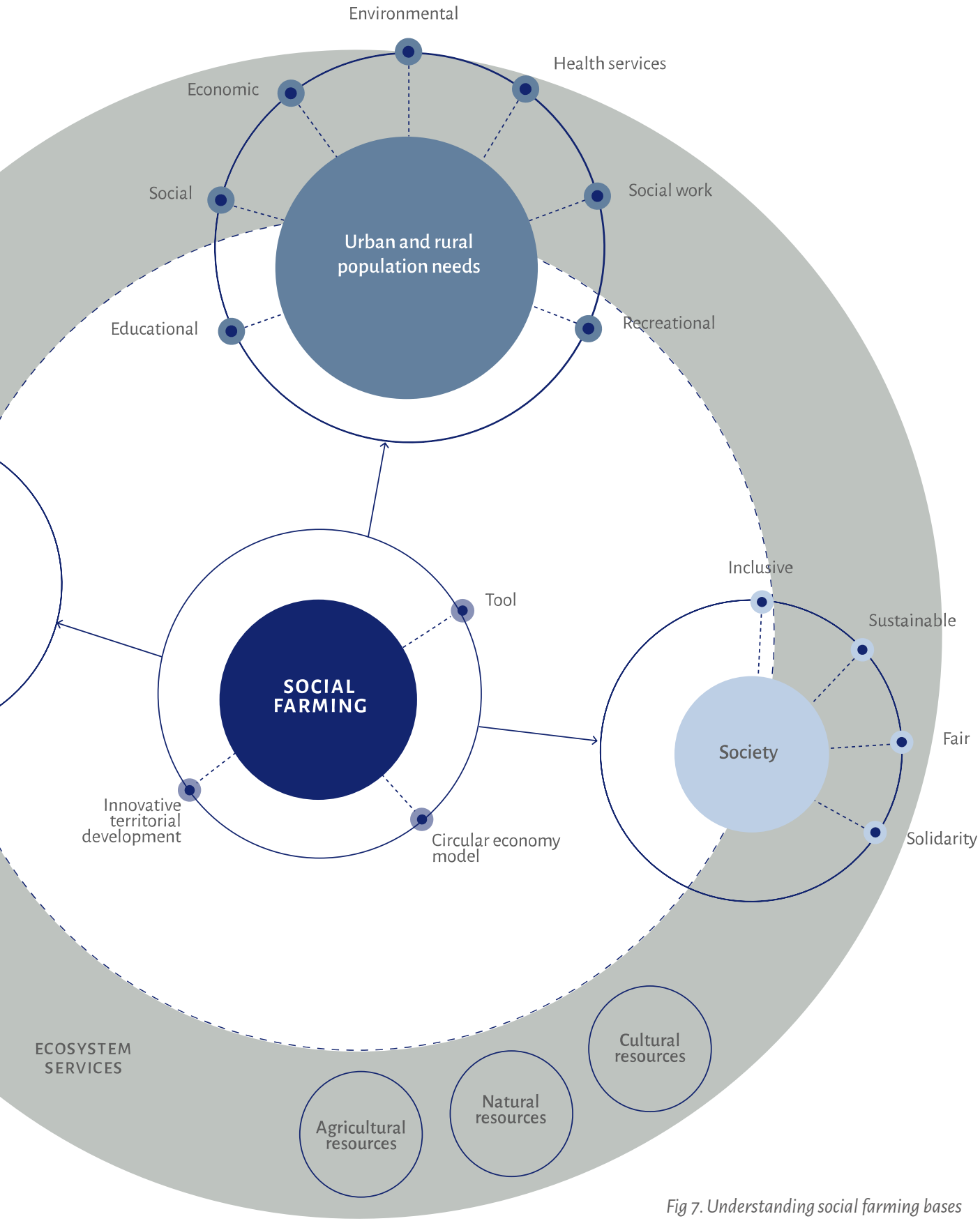


Fig 7. Understanding social farming bases

Social farming also helps rural communities maintain their economic viability. It gives farmers the chance to diversify their sources of revenue, easing the difficulties that traditional agricultural methods encounter. Collaboration with neighborhood businesses, tourism providers, and healthcare groups is common in social farming efforts, which boosts local economies and adds jobs.

2.1.4 Autonomous design

Autonomous design is a theory by Colombian anthropologist Arturo Escobar, which started as a particular interest on behalf of the author in design literature that included Manzini, Maturana and Varela, Mau, among others. It is nurtured by design thinking, and paradigm-shifting authors and is mainly focused on abandoned or marginal communities affected by the current social crisis. Escobar identifies the capacity that design has to generate and improve life. Its pursuit is to redesign the world as it is. It sees design as a cultural-political project. "Out of the studio" is a key concept that can be summarized in co-design thinking that is focused on the production of life itself, it's interactive, user-centered and off course, collaborative. The design knowledge, in co-design, is not only used by designers to project ideas and solutions but is spread across the entire community to allow every individual to assume a design position within the project.

The defense of life as a system of inter-relation and inter-dependency and therefore as the very essence of nature is key to understanding Escobar's thesis of a world where many worlds fit. His argument is that social struggles are evidence of how communities attempt to take a governing position toward others, resulting in what Escobar defines as an ontological occupation. Escobar speaks of a concept defined as an ontological occupation, which is a phenomenon in which one reality dominates and makes other realities impossible to develop, gradually degrading them to a point of nonexistence. According to him, neo-liberal globalization is the current example, acting as a war against collectiveness, blocking every possibility to allow different worlds to relate and coexist. Examples circle around rural indigenous communities in the Cauca region, dealing with mining companies taking the Nasa people's territory, occupying it with extreme prejudice, and destroying the way of life of these ancient groups that have existed since even before Columbus set foot in the American continent. The finality of this new way of understanding life and its implications in ensuring a balanced existence of different realities or a Pluriverse.

Escobar states that development has always worked by bringing in everything that the community lacked, but never by figuring out ways to produce those things from within the community itself.

Every community engages in its own design: for most of history, communities engaged in an embodied or embedded type of design independent of expert knowledge; now, both detached and embodied forms of reflection and design (diffuse and expert design) are required. What the community initially creates is an investigative or self-learning system. Although the community and we as designers may become "co-researchers" in the co-design process, it is the community that explores its own reality. Autonomous design embraces futurality as a statement about the prospects for the accomplishment of common goals and embraces ancestrality as it arises from the history of the relational worlds in the issue.

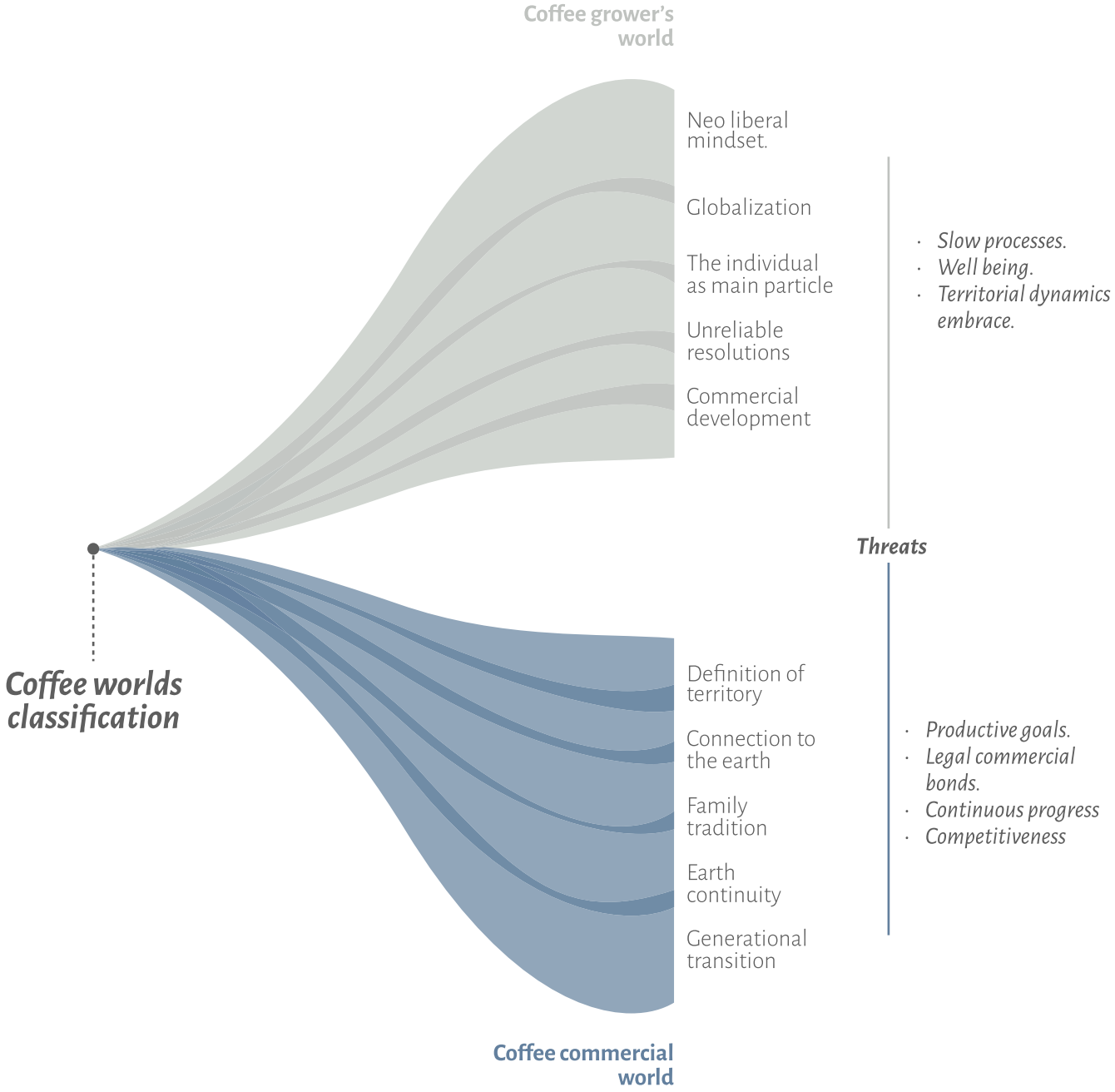


Fig 8 . Coffee worlds understand in autonomous design (fig. 8)

Regarding coffee-growing communities, providing not only a solution to their problems but also as much knowledge as necessary to improve upon the final proposal and extend design thinking in an independent and autonomous way to generate new changes by themselves. The approach to coffee farmers and their families should work not as an imposition of rearrangement of their entire living conditions, but as a collaborative congregation, an assembly of a variety of disciplines and experiences to build a new and better environment for coffee farmers that in time can be self-improved by the coffee farmers autonomously, becoming more capable of designing their own strategies in the long term.

2.1.5 Regenerative design

Regenerative design is a holistic approach to design which seeks to generate positive environmental, social, and economic outcomes. By utilizing the principles of nature-based design, regenerative design endeavors to create projects and systems that actively replenish and regenerate resources, rather than merely using them efficiently. focuses on working with or mimicking natural ecosystem processes for the purpose of returning energy from less useful to more useful forms.

This concept is rapidly gaining momentum, as demonstrated by its use in the development of rural coffee-growing communities. By looking to nature to inform design, Regenerative Design can contribute to the overall sustainability of a project by addressing climate change, resource depletion, and social inequality, while also providing net-positive impacts for ecology, health, and society. Regenerative design is becoming increasingly important as it provides a viable solution to the growing environmental crisis, offering a sustainable alternative to traditional design approaches. It provides a unique set of benefits that can be implemented in an increasingly wide range of applications and settings. An example of regenerative design is regenerative agriculture which uses intercropping, cover crops, and compost to keep soil healthier. Regenerative design offers the potential for a great positive impact in rural communities, particularly in coffee-growing communities. By utilizing regenerative design principles and practices, these communities can improve their economic viability and local environment, while also reducing their

dependence on external inputs, which is ideal for the Colombian context, given the poor infrastructure to reach rural coffee growing zones. From improving soil health and productivity to minimizing the use of agricultural chemicals, regenerative design provides an opportunity to transform coffee-growing communities and create positive change on both a local and global scale.

Within the holistic approach to designing the strategy, regenerative design helps consider the entire system and particularly its interactions with the environment. It integrates humans with nature to create resilient and equitable systems by restoring and renewing energy sources and materials. It is seen as a step above sustainable design, which seeks to minimize damage to ecosystems and reduce resource consumption. The five guiding principles of regenerative design include safe and healthy materials, materials reuse, renewable energy and carbon management, water stewardship, and social fairness. Regenerative design involves designing with the future in mind by creating buildings that are not only energy efficient but also actively contribute back to the environment. Examples of regenerative design include the use of renewable energy and natural resources, as well as strategies for materials reuse and production of zero waste. By utilizing the principles of regenerative design, rural communities can reduce their environmental footprint and increase their resiliency and sustainability. Furthermore, regenerative design has the potential to bring about greater social awareness and inclusion in rural communities, thus strengthening their local economies.

Fig 9. Michael Burrows

Fig 10. Traphitho, 2017

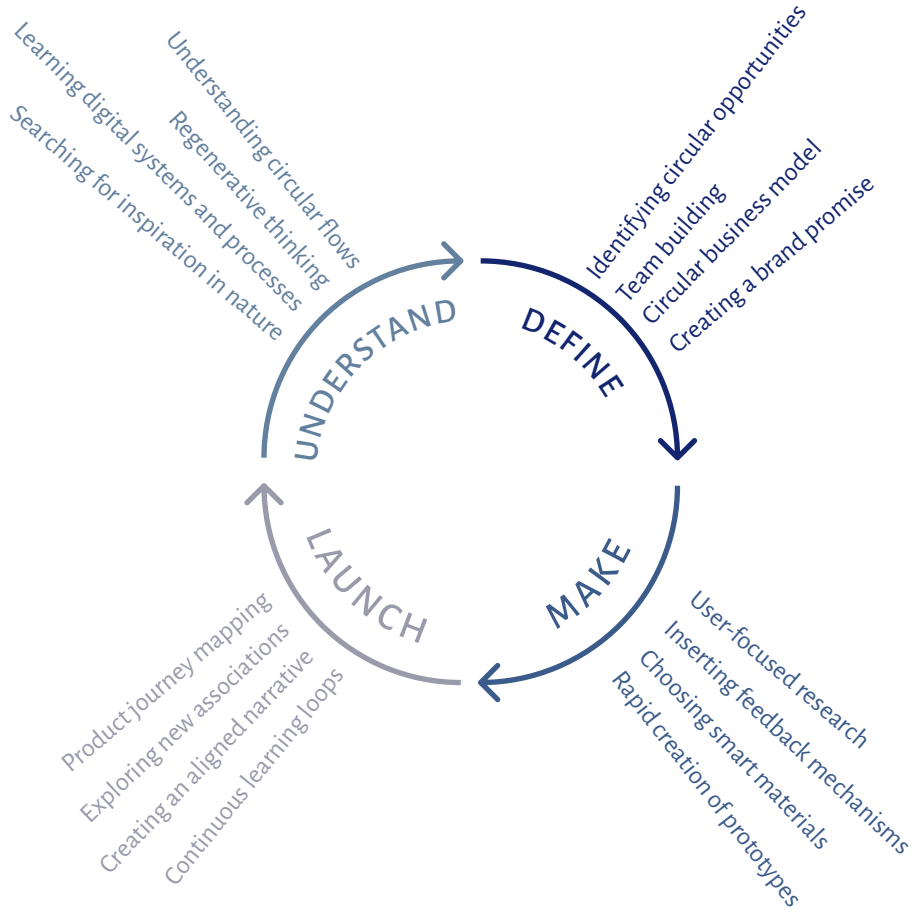
2.1.6 Circular design

Circularity is a trending phenomenon nowadays in more than one field. Adopting new production and consumption practices set to incorporate waste from the same or from other chains is the target that every sector should aspire to reach. In order to understand its importance, it is imperative to explain the opposite of the circular mindset, which is the linear mindset. Linearity, or in commercial terms linear economy, is the base model that most organizations are built on. This model is a consequence of capitalism, and it can be defined in three principal steps: taking resources, producing something, and disposing of the remains of the used product. This sequence represents a major flaw in how the industry and markets in general work, given the fact that this continuous exploitation of natural resources acts as if those were unlimited, which is far from reality. Renewable energy and resources exist currently, but most products rely on finite materials that imply an aggressive extraction, which derives in the destruction of ecosystems, fauna, and the natural balance of the earth. That's where circularity appears to be the rational and the right path to take.

A circular economy seeks to establish productive processes in which no waste goes unused, introducing the outputs of one process or step as an input of another. Creating these closed systems allows for a less significant impact on the environment, but also optimizes the usage of resources, which translates to less effort in waste management logistics and costs.

Circular design is the method through which circularity is implemented in a system. The main goals of circular design revolve around optimizing materials and existing structures, maintaining or recovering materials, and maximizing the efficiency in supply cycles. The first step of the method is to understand how the flows of matter, energy, and capital are between the different stages of production. Based on regenerative thinking and taking inspiration from natural phenomena, circular opportunities are identified. Then the circular business model is designed, attempting to close every loose end of the input/output flows, that being implementing waste into the same production chain or justifying waste utility in other manufacturing activities. This may demand a rebranding process and prototype creation to make sure as much as possible that the company reflects its new philosophy and that the implemented changes are feasible, respectively.

Fig 11. Circular design methods

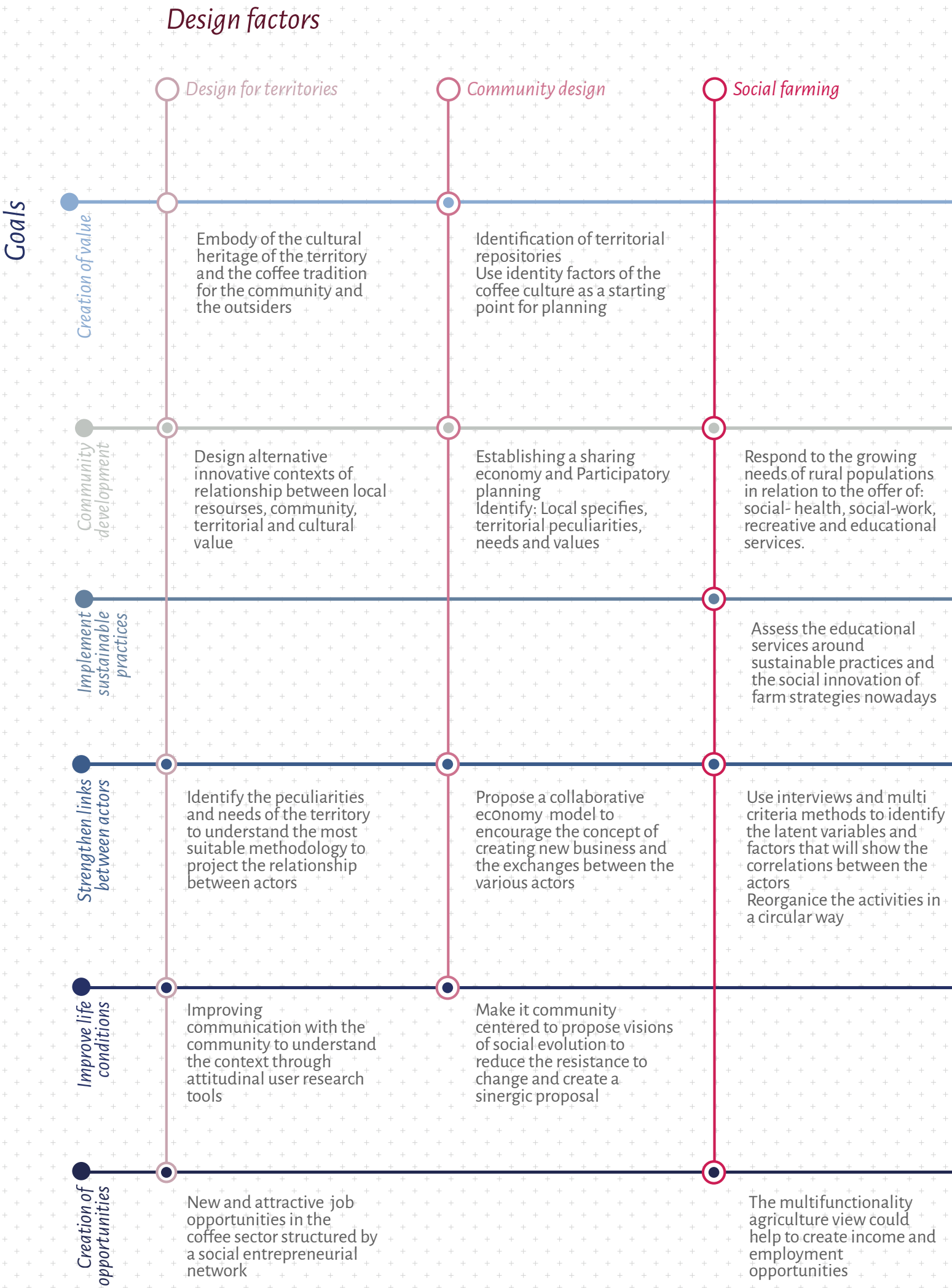


Note: Adapted from Circular Design Guide. Circular design methods. https://www.circulardesign-guide.com/methods

A crucial step of the circular design method is always inserting feedback mechanisms that allow work teams to evaluate the effectiveness of the model, as it creates continuous learning loops in which the new system is constantly improving. New practices introduced by circular design are a main necessity for the current Colombian coffee sector, as it will be exposed later, given the lack of alternatives to how different kinds of waste are managed in rural coffee farms, becoming a hazard to the immediate surroundings of coffee farmers, the environment of high natural value land and to the resources that go to other systems.

2.2 DESIGN FACTORS BASELINE

This chart is the crossing of the established goals in the first part of the research and the design factors from each theory, to find where these two elements coincide. As a result of the goals not coinciding with every theory, the outcomes of the crossing highlight the most useful tools and concepts from every theory in regard to the aims of the project, forming a coherent and solid conceptual foundation and therefore, becoming an important input that will be applied as a guideline to develop the project's concept. In the end, the extracted points are in sync with the systemic methodology thanks to the wide range of means to confront the multiple and diverse problems that arise in the Colombian coffee sector.


Design factors
Design for territories
Community design
Social farming
Goals
Creation of value
Embody of the cultural heritage of the territory and the coffee tradition for the community and the outsiders
Identification of territorial repositories
Use identity factors of the coffee culture as a starting point for planning
Community development
Design alternative innovative contexts of relationship between local resourses, community, territorial and cultural value
Establishing a sharing economy and Participatory planning
Identify: Local specifies, territorial peculiarities, needs and values
Respond to the growing needs of rural populations in relation to the offer of: social- health, social-work, recreative and educational services.
Implement sustainable practices
Assess the educational services around sustainable practices and the social innovation of farm strategies nowadays
Strengthen links between actors
Identify the peculiarities and needs of the territory to understand the most suitable methodology to project the relationship between actors
Propose a collaborative economy model to encourage the concept of creating new business and the exchanges between the various actors
Use interviews and multi criteria methods to identify the latent variables and factors that will show the correlations between the actors
Reorganice the activities in a circular way
Improve life conditions
Improving communication with the community to understand the context through attitudinal user research tools
Make it community centered to propose visions of social evolution to reduce the resistance to change and create a sinergic proposal
Creation of opportunities
New and attractive job opportunities in the coffee sector structured by a social entrepreneurial network
The multifunctionality agriculture view could help to create income and employment opportunities

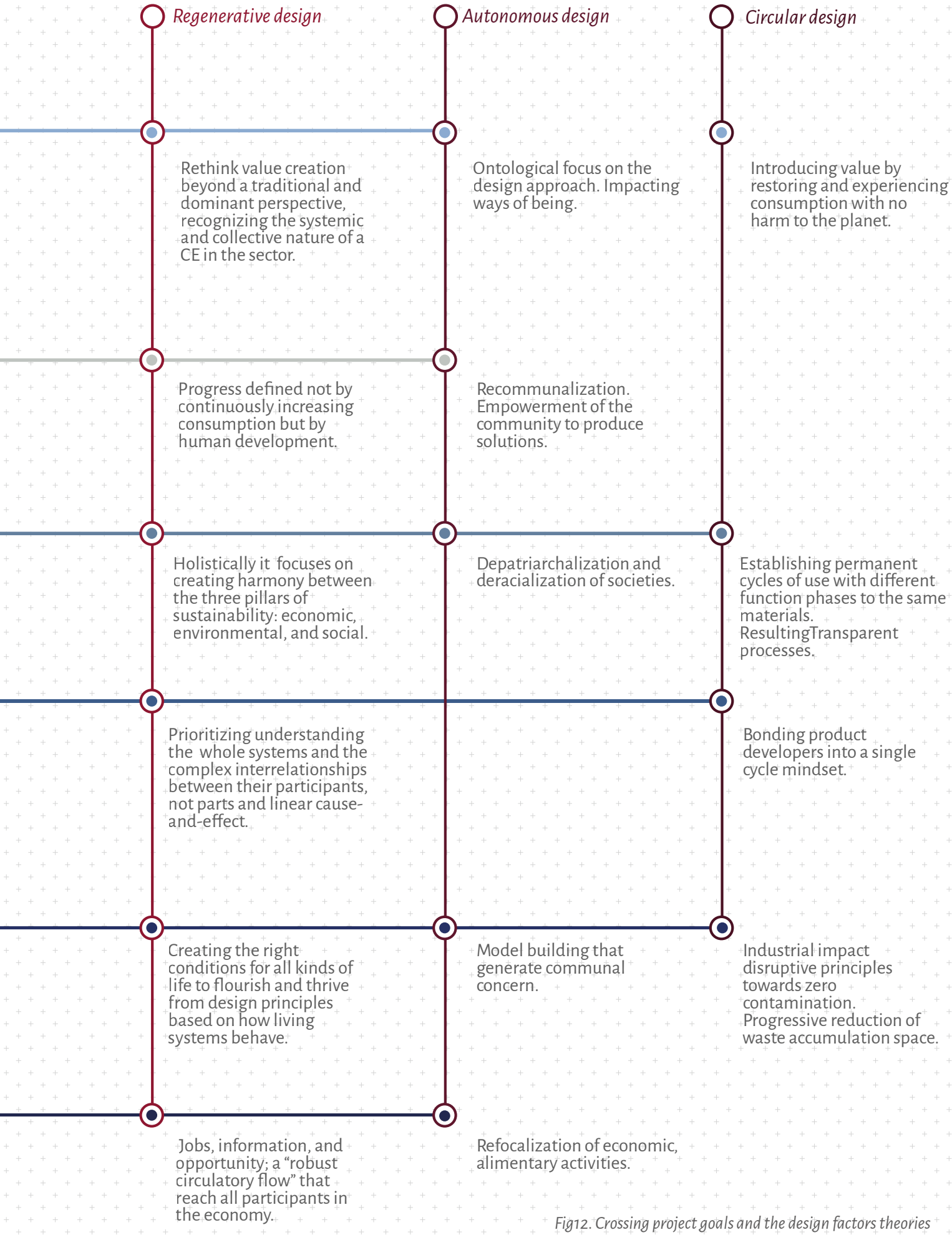


Fig12. Crossing project goals and the design factors theories

03

Systemic design approach

3.1 Concept

3.2 Methodology & and instruments

3.3 Systemic design for sustainable rural development

3.1 Concept

Systemic design is a relatively new branch of design that integrates systems thinking and human-centered design, helping designers to cope with high-complexity scenarios and design alternatives to the current linear productive system, considering the flows within economic activity. Such flows, information, matter, and energy, provide a holistic vision of a specific system and the connections that bound the different actors (suppliers, producers, sellers, and consumers) inside it, from which systemic design proceeds to encourage and boost a horizontal dialogue between them, working also as a mediator. The systemic approach aims for a circular way of developing the economy instead of relying on the linear model (based on exploiting resources, creating products, using them and then throwing out the remains once the product is no longer usable), introducing the outputs of one system as the inputs of another.

The systemic methodology is applicable in a wide range of contexts, those being cities, corporations, industries and big economic sectors, but also in small businesses and communities of rural municipalities. It ponders on the conditions in which a community produces and consumes, its values, identity, and its resources, to produce development and well-being for both individuals and collectives.

The relationships between resources, productive realities, and a territory's society are configured through systemic design, increasing and enhancing regional assets. The end goal is to reach environmental, social, and economic sustainability.

The systemic discipline has five fundamental pillars:

Outputs/Inputs

The outputs of one system, most commonly waste), are repurposed as inputs of another, for example as raw material of a different productive chain to prevent emissions.

Relationships

Connections between actors in a system are pivotal to maintaining its proper development. Local agents' collaboration promotes economic growth and context improvement.

Autopoiesis

Self-sustainability of a system, as well as its co-evolution with other systems, guarantees the transcendence of new practices.

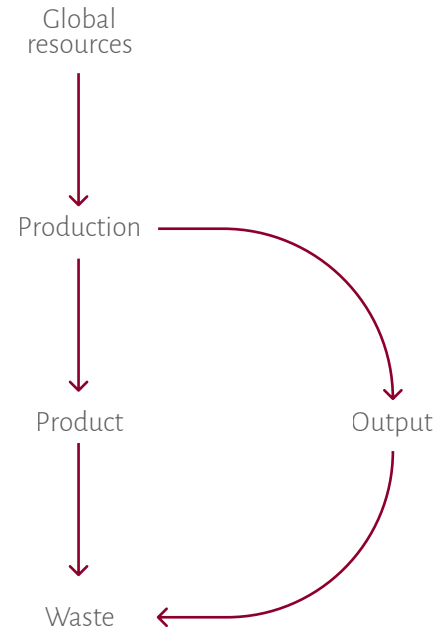
Acting locally

Prioritizing the context in which design happens, regarding outside realities, is critical to strengthen the bond of the community to the project's goals.

Humanity-centered design

Human beings are the focus of any systemic project, having a strong relationship to their territory, society, culture, and general context.

Linear model



Systemic model

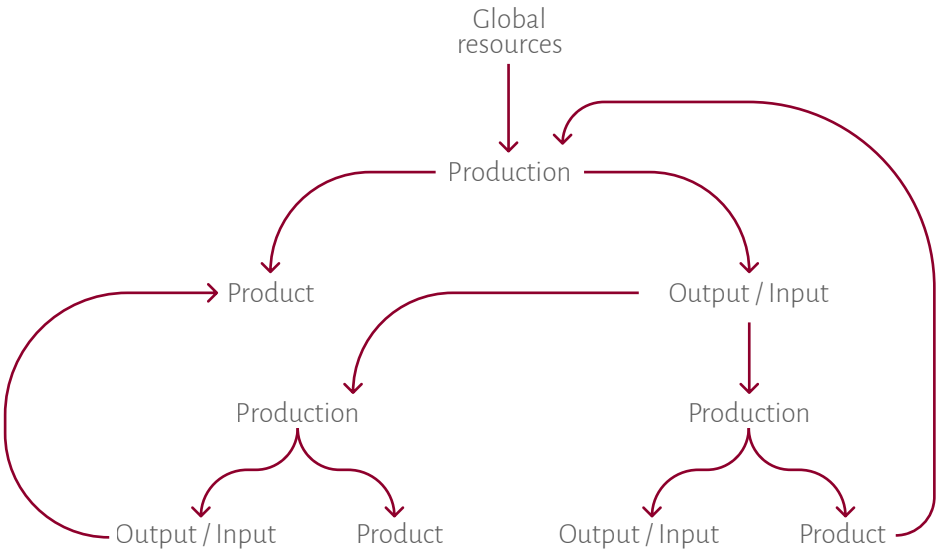


Fig 13. From linear to systemic model

3.2 Methodology and instruments

The systemic methodology consists of a series of logical steps that make it possible to analyze and understand a complex scenario in order to design strategies that generate a positive impact and promote a paradigm shift in productive, environmental and social behavior.

Fig 14. Bozzolla, 2020

Holistic diagnosis

Given the mediation role that designers have within the context of the project towards the actors, it is key to provide a comprehensible blueprint of the system to facilitate a horizontal dialogue among such stakeholders.
To establish a complete vision of the scenario in which a system operates and to simplify its complexity, systemic design supplies a tool known as holistic diagnosis, which is the state of the art's projection. This mapping is created through different levels of investigation, considering social-cultural, economic and environmental aspects. [[[The holistic diagnosis provides, as stated by the Systemic Design Lab, "a mapping of the state of the art of a context, product, process, service" (2021).]]]. The information is gathered in a map that provides an accessible visualization and facilitates data interpretation and analysis.

The HD process is a nonlinear process of five steps:

1. Assess: The setting of a research format tailor-made to the parameters of the project, the scope, the boundaries, the research topics, and the data categories. The end asset of this step is the format to begin the research.
2. Research: The research of both

qualitative and quantitative data, found with desk research of conventional (scientific articles, official databases, essays, etc.) and unconventional (blogs, video essays, social media, etc.), and field research based on ethnography, interviews of key actors and observation methods.

3. Collect: referencing the information inside a custom database built from the format in the assessment step. Referencing every data is key to granting traceability of the analysis and the made decisions derived from it.

4. Visualize: the design team communicates the information to the actors in an accessible way, allowing them to understand the blueprint of the system. Graphic tools like software, concept sketching, infographics and gigamaps.

5. Interpret: Once the system is evidenced, a holistic reading of the data is necessary to effectively find connections between the information and the system's components.

The nonlinear style of the holistic diagnosis process means it is possible to reset and reevaluate every piece of information, having a continuous feedback cycle that ensures the validity and relevance of every piece of evidence and data.

Fig 15. Systemic course at Fablab, 2022

Challenges and opportunities

The identification of challenges and opportunities can be extrapolated to both territories and productive chains. From the territorial point of view, this step considers different levels of elements, such as geographical and environmental factors (climate, ecosystems, fauna, etc.), the different demographic profiles found in the territory, as well as their living conditions and education. Welfare and labor indicators are other important aspects taken into account. With regard to production chains, the range of factors is more restricted and not as diverse. It is understood that all the elements that make up the production value chain, whatever they may be, are closely linked to each other on a smaller scale. In this scenario, it is important to analyze the supply chain (origin of raw materials, transportation, logistics), the production process (energy consumption, waste management) and the overall flows of the system. In addition to the horizontal dialogue between stakeholders where everyone is able to understand the system and its mechanisms, additional literature research is required to complement the initial literature review, now focused on technical aspects, such as materials, machines and technology, safety protocols, etc. By carrying out this additional research and analysis, the issues that affect the optimal development of the system are detected and classified into different levels: social, environmental, economic and flow.

In both cases, these key points are the main assets to create value within the designed strategy of the improved system, as they provide specific information on how to involve stakeholders and introduce new practices in the project. For this reason, the overlapping of information related to territory and production is a mandatory step to understanding how these two realities can strengthen their linkages and, therefore, become more sustainable and efficient. This leads this phase to the identification of opportunities, where the objective is to determine different possible ways to address the critical points. Research must support each solution that is projected in the new system, as these strategies are designed on the basis of existing practices already applied in different contexts and systems around the world. For each challenge, single or multiple solutions may be identified, and a solution may address more than one issue.

Systemic project

The critical vision that the C&O step brings to the project definition and the list of opportunities is the base for the systemic project framework, and in order to implement the most impactful strategies into the system, the solutions are classified following what´s known as a multicriteria analysis, which is a group of selection criteria created specifically for the context of the project. These criteria are defined bearing in mind the five principles of systemic design and the background of the context provided by the holistic diagnosis. The confrontation of the opportunities with the multicriteria should filter the least adapted strategies for the project and at the same time discover possible connections between the remaining solutions that are more adapted to solve the current criticalities of the system.

Selecting the best opportunities also means that, in order to correctly implement change in the context, laying out the new relationships and actors is indispensable to set the boundaries of the new context, which is already framed in a systemic model, rather than a linear one.

Finally, just as in the HD step, laying out the project in graphic comprehensible formats helps the design team and the different actors to understand their roles and the effect of their interactions with the new strategy, and how the after-effects change in regard to the old system model.

Study of the outcomes

The final step in the systemic methodology is to comprehend the many repercussions of the project in the context of two degrees: during the transition from the linear to the systemic model and once the strategy is fully implemented and is sustained through time. This implies the study of the correspondence between the obtained data in the HD and the new strategies introduced in the SP. The study of the outcomes aims for a definition of the projection of how the changes in the system perform and impact its components. Accordingly, it is important to maintain an analysis capable of probing at different scales, from the general context to the particular phenomena occurring within the system, working as a "zoom-in, zoom-out" analysis to see and interpret the project's complexity.

The analysis of the outcomes is done in three levels: quantitative and qualitative evaluation, the scale of the project on different scales, and the consequences in time.

- Outcomes evaluation: is the inquiry of the new practices and relationships from an environmental, economic, sociocultural and logistic perspective, by questioning how the changes influence the territory interactions between stakeholders (traditions, value chain length, input/output looping).
- Project scale: the impact of the project in three scales: micro-scale, which relates to single initiatives like a product or a particular action; meso-scale, which considers multiple actions carried out in the context, such as clusters; macro-scale regards the implications on a regional, national and even political level, like policy making.
- Timeframe: solid assumptions on the temporary dimension of the solutions' impact, that being in the short, medium, or long term.

3.3 Systemic design for sustainable rural development

Rural contexts have some characteristics that make it difficult to develop a design project, compared to other types of scenarios such as big cities. While in a city there is an important concentration of population in small territorial extensions, in the countryside the opposite is generally the case: it is very common to have to make long trips to get from the land of one family to the land of another. In addition, accessibility to these families is often conditioned by precarious road infrastructure, due to factors ranging from adverse weather conditions to low state presence in the area. Rural populations are more exposed to discrimination and are more vulnerable to periods of governmental, economic and social instability.

Systemic design is adaptable to these realities, as it does not depend on the type of population being addressed, their educational level, socioeconomic status, or political position. Systemic design means researching and studying without prejudices or political or corporate conditioning factors, since only objective analysis, in addition to rigor, can ensure effective results. Sustainable development in these territories depends to a large extent on the accuracy of the diagnosis made and the problems and opportunities identified, which is why it is essential to dispense with any type of bias and adhere to an objective analytical methodology.

The holistic approach of systemic design frames the ways in which the population works, its infrastructure, education, livelihood and culture. Understanding a community not only means facilitating the pinpointing of criticalities but also the proper actions to approach the people when introducing changes in the system, the language to use and the time span in which the transition to an evolved system occurs. Tradition and cultural heritage are essential assets to develop an impactful systemic project in any context. Culture is what makes people authentic and determines their priorities in the social and productive spheres. Sustainable practices should become a part of rural economic culture and in that sense, design embraces the ethos of a community to generate awareness and a sense of appropriation of change in the population, which doesn't alter the essence of their identity, and giving the people the role of protagonists in the development and maintenance of the system through generations.

To guarantee the long-term viability of natural resources, rural development must integrate sustainable resource management techniques. The incorporation of sustainable agriculture, water conservation, renewable energy, and waste management methods into rural development initiatives is made easier by applying systemic design. It supports the preservation of biodiversity and the efficient use of resources by promoting circular practices, resource efficiency, and ecological stewardship.

04

Coffee production sector

4.1 Overview

4.2 Café de Colombia

4.1 OVERVIEW

The coffee industry has grown in the last decades. Its impact on today's society is undeniable, being coffee one of the most traded commodities and consumed worldwide by millions of people. It is estimated that more than 125 million people in developing countries live thanks to coffee-based activities (ICO, 2021), which denotes a profound economic significance. Its production takes place in more than 50 countries and its consumption has increased significantly, with an average annual growth rate of 1.3% during the last decade (ICO, 2021). The coffee markets have evolved at a frenetic pace, so much so that companies have turned their efforts to factors such as the design of experiences and the implementation of new technologies that accommodate the various types of users that vary not only in the type of coffee that they consume, but also in their consumption rituals, generating new trends and deriving in the standardization of the product thinking of these consumer preferences

4.1.1 Coffee industry trends

The International Trade Centre, the joint agency of the World Trade Organization and the UN, created a document known as the Coffee Guide. The guide reviews the dynamics that have marked the development of the coffee industry and the value chain in recent years, based on first-hand information from stakeholders and experts in the field. The contents of this guide include the changes in the supply and demand of coffee, the trends towards which the industry is heading and towards which it should be heading, and the projection of what the constant evolution of the markets, climate change and the policies that regulate the production and coffee commercialization dynamics imply.

Climate change: New production methods

Producers have begun to use measures of climate mitigation and adaptation at the farm level, both for agricultural operations and post-harvest processing, after seeing these consequences firsthand. More climate-smart agriculture is supported by government policies, producer cooperatives, foreign funders, and collaborations with the commercial sector.

"Smallholder farmers produce 80% of coffee, and they are the most vulnerable to this crisis. Many are unfinanced or underfinanced, and they often rely on just one crop – coffee – for a living. Climate change adds even more pressure on their bottom line, with coffee prices often low and volatile."

The Coffee Guide identifies five principal risks derived from climate change (p. 24):

- Loss of suitable areas for coffee production and shifts to higher altitudes.
- Increased water stress.
- Poor flowering and cherry development.
- More outbreaks of pests and diseases.
- Greater vulnerability of smallholder and women farmers.

The awareness of these phenomena has created a trend in the last few years of improving productive practices, both in farming and the post-harvest phases. Being open to adapting to climate change on behalf of the coffee farmers is also an argument for policies to evolve, in the public and private sectors, and support new practices.

Specialty coffee continues its ascend

The emphasis on quality and provenance, two characteristics that characterize third-wave coffee, is referred to as specialty coffee.

Due to the excellence of the beans, the majority of which are Arabica, these coffees typically sell for higher market prices. However, it is crucial to remember that not all Arabicas are specialty coffees.

Fig 16. Jhonathan Borba, Creative Commons.

Fig 17. Maria Orlova, 2020

Quality: Consistency and excellence

As consumers become more conscious of the origin of the product that they consume and coffee growers begin to adopt new styles of production, the quality of coffee has gone from being an added value to being a requirement to be competitive within the market. Currently, the coffee market is seeking to evolve in the premium category through an offer that takes into consideration an increasingly deeper focus on environmental and social sustainability, thus creating a segment that seeks to surpass specialty coffee through sustainable strategies that offer higher quality at a better price.

The producer becomes consumer

A potential improvement to boost coffee markets is promoting local consumption. Many of the producer countries tend to import coffee from different latitudes to use in national markets, prioritizing international buyers in the commercialization of local production. Encouraging domestic coffee consumption and enabling value addition at the source for domestic sales of roasted coffee would enlarge coffee culture in already producer/consumer countries, could sustain farmers' livelihoods when international prices decrease dramatically, and also generates interests in new potential consumer internal markets.

Digitalization: From seed to cup

For years the coffee industry has been moving through technology, seeking to adapt to its rapid and constant evolution and to the opportunities that it offers to the productive sectors. In the case of the coffee sector, technological trends are being implemented in practically the entire chain, since it is being used to make improvements from the harvest through management and production tools, to trade thanks not only to more efficient shipping techniques but also to the access given to the consumer to trace in more detail the path of the coffee he is acquiring and to actively participate in the financing through blockchain and e-banking and improvement of coffee production regardless of latitudes.

The Coffee Guide implies that the transformation of the coffee industry in the direction of long-term sustainability is only possible through systemic alliances, meaning the collaboration between actors is a fundamental factor in order to guarantee a correct implementation of changes aligned with these trends that the coffee market is moving towards. Public-private partnerships in particular are key according to the analysis, as they cover the vast majority of productive and commercial stages, being the best paths ahead for a genuine systemic transformation that has the lasting effects and influence required for a successful coffee business.

4.1.2 Verification and certifications systems

The first thing to be clear about is the difference between the terms “seal” and “certification”. Although these terms are linked, they mean different things. The seals refer to those small logos of diverse shapes and colors that can be found printed on coffee packages.

Certification is the process that the producer must carry out in order to demonstrate that its coffee is different from others that are found in the market. In this process what is verified is the traceability of the coffee from its planting until the coffee arrives ready to be consumed. The way in which this traceability is measured depends on the specific standards of each seal.

In the end, if it can be demonstrated that the product complies with all the standards, it obtains the right to use the corresponding seal on the packaging of its product.

For our context, the following certifications and verifications were identified that have been promoted in the Colombian coffee sector as a commitment to integral growth.

The first group is recognized by the implementation and compliance of standards with regulations or private policies that bring together large industries dedicated to the manufacture of coffee such as Starbucks and Nestlé. Their main objectives are the implementation of productive practices, assuming quality standards such as the Nespresso AAA verification or the CAFE Practices code supported by Starbucks, based on social welfare and coffee quality.

The second group is integrated by international organizations that work to promote quality processes based on the ethics of sustainability such as: FairTrade International (FLO), Rainforest Alliance, UTZ Kapeh and Organic Coffee.

The difference between the two previous groups is based on the fact that in the first,

the production standards are governed by the corporate policies of the manufacturing companies. In this case, their failure should lead to process improvement, while in the second the implementation of quality seals has a continuous control, in that sense, non-compliance can cause the loss of the quality seal. It could then be said that the first is a good strategy for the integration of good practices that producers can later capitalize on through the implementation of the certifications mentioned in the second group (Arango et al. 2021).

Parallel to the two previous classifications, some proposals of coffee producer organizations that follow quality guidelines and have regional identification are recognized. These proposals are normally represented by organizations that have economic and social power and always work with the main objective of improving their sales prices over conventional coffee. As in the case of Colombia with the Colombian Specialty Coffee program, developed by the FNC. These associations pursue particular benefits that endorse their production practices, which could be considered a previous step to joining the system.

On the other hand, the Common Code for the Coffee Community (4C), unlike Nespresso AAA and C.A.F.E Practices, is a verification system that is not corporate, so the demand for coffee is not always assured.

Fig 18. Cottonbro Studio

4.1.3 Coffee industry impacts

Just as any other industry, coffee production generates significant impacts on several levels, and considering the ever-growing volume of its market, it is only logical to believe those impacts will also increase. The repercussions of the coffee industry are remified in social, political, economic and environmental degrees.

In regards to social implications, even though coffee farming is an important activity to mitigate poverty in low-income countries, providing livelihoods for millions. As stated by González and Melo (2020), "the coffee sector plays a fundamental role in the economies of many developing countries, contributing to employment, export earnings, and rural development" (p. 108). Nevertheless, coffe's commercial price is highly volatile compared to other commodities. It often happens that, when global harvests are good and as the territories destined for planting increase, prices sink even below the production cost. This means that income for coffee farmers is not standardized nor does it change gradually; these abrupt alterations in pricing expose small producers who live on daily sales to cut on basic needs in order to save resources. In the words of Lépicier and Schmitt (2021) , "smallholder coffee farmers often face low incomes, limited access to resources, and vulnerabilities to market fluctuations" (p. 335). Moreover, the industry already suffers from unequal distribution if profits caused by an extense number of actors involved and third parties that add no value to the chain, a dynamic that leaves the coffee growers as the most vulnerable link.

In the political field, international commercial agreements play an important

Fig 19. BBC News, 2021

role in the industry, as they set they reflect the influence between stakeholders and governments. Policy making is often struck by political instability in producer countries, which not only hinders the correct functioning of legislative entities for the development of effective policies, but also generates uncertainty in all phases of the production of industries, including the coffee industry. To all this is added the fact that in the area of exports, the countries that have a greater infrastructure to carry out the post-harvest process acquire an enormous quantity of unroasted beans to carry out the successive steps in their countries, which added to the problems previously mentioned, cause coffee growers not to generate greater income by selling a more finished product.

On an environmental level, coffee farms impact biodiversity in a two-way dynamic. On one hand, coffee fields provide habitat for different species, promoting the conservation of biodiversity in farming territories. That being said, it also causes the opposite effect, causing habitat loss and putting local species at risk. It is necessary to point out the implications of cultivating coffee, as adapting soil to crop conditions may cause deforestation and erosion, which given the rising demand of coffee by consumers could imply the clearing of natural forests, causing environmental hazards such as water contamination, fauna loss and ecosystem unbalance.

Evidently, social inclusion in the coffee value, as well as fair trade practices like, how to enhance certification mechanisms and qualify a higher volume of product, are essential to improve not only the productive capacity of coffee farmers, but also to allow them to acquire financial stability to positively change their life conditions and the well-being of their communities. The introduction of value adding strategies in the farming sector of the coffee industry can contribute also to the long-term economic sustainability of the sector and quality standardization. Paloma Caro, Environment and Natural Resources Consultant at The World Bank, stated the following in a study of shaded coffee systems and species conservation: "Farmers can obtain premium prices and better justify the use of traditional shaded systems. Policy makers can promote double objectives of conservation and livelihoods for farmers [...]. The results also illustrate that coffee consumers can help promote conservation by choosing certificated coffee." (2016) Overall, the evident conclusion is that impacts will always exist as long as there is no balance in the way actors operate; collaboration is therefore, not just a positive addition to the system, but an urgent necessity that could solve current problems and prevent potential industry crises in the future.

4.2 CAFÉ DE COLOMBIA

Colombia, being a country recognized worldwide for its coffee tradition, is no stranger to this reality. The production of coffee at a national level entails a series of implications and repercussions in different social groups, the key profile being that of the “coffee grower”. The Colombian coffee industry has institutions, mechanisms and dynamics that distinguish it from the realities of other producing countries, both in the region and in the rest of the world.

4.2.1
Colombian coffee's role in the global market

It is no secret that Colombia has maintained a worldwide fame and recognition for the quality of its coffee, so much so that its reputation has even been mentioned in various scenarios of popular culture: from mentions in television series, movies, to portraits of coffee plantations in different periods of the history of art, Colombia has represented a household name when thinking and talking about coffee. Large companies of the food sector take advantage of every opportunity to highlight the presence of Colombian products in their coffee offer, maintaining and enhancing the iconic character of the Colombian coffee culture. This reputation is the result of a series of factors that make Colombia the top-of-mind option for the average coffee consumer.

The geographical conditions of the country, as will be explored below, are one of the keys for coffee to be cultivated in diverse types of soils, altitudes and microclimates that widen the range of bean profiles that can be grown. Each region, having such diverse territories and climatic conditions among them, is capable of producing coffee with different profiles that adapt to the preferences of different types of consumers. In turn, the excellence of the product also lies in the importance given to the product in the international market.

The FNC, like other institutions, through its quality and selection controls, gives high priority to grain exports. Colombia has remained as a power in the production of Arabica coffee, the most produced type of bean worldwide and the most popular among consumers. The production, in technical terms, has not become an industrialized and millimetrically standardized chain, which in the eyes of the general public denotes more artisanal methods. Part of the current practices for the production of coffee in Colombia is due to the enormous tradition and the deep-rooted legacy of generations that are still present in coffee-growing homes. In fact, it is this same tradition that has been used to promote Colombian coffee, which is an important part of its recognition. Icons such as Juan Valdez and his mule Conchita are symbols that summarize all the cultural baggage of Colombian coffee. So much so that even in populations that are not characterized for producing coffee, elements such as handicrafts or souvenirs rely on this iconography to sell the image of the country and its people. This corporate and popular branding has played a fundamental role in maintaining the notoriety of the national product. Thanks to this, products that use the labels “100% Colombian Coffee” and its derivatives, generate a greater appeal with respect to coffees of a different origin.

Fig 20. Hermanos, Colombian coffee roasters, 2021 (fig. 20)

4.2.2 Industry characteristics

Coffee production system: For this section it is important to clarify that a coffee plantation is understood as an open system, and as such interacts positively or negatively with its environment in terms of the functions of the system and the way in which it is managed. The coffee production system is then defined as "a set of factors and technological options that, by interacting with each other, make it possible to obtain maximum productivity from the biological, economic and social points of view." (Valencia, 2020, p.16)

In the Colombian coffee regions, homogeneous areas have been identified in their soil, relief and climate characteristics. These have made it possible to define the following production systems in the country: traditional, technical, semi-shade and shade.

Systemic Traditional production system:
Those coffee lots with Caturra or Típica varieties, with unregulated shading and a harvest of less than 2,500 plants per ha.

Semi-shade production system:
This system has as its main characteristic based on the arboreal component of the crops as a regulator of sunlight. Since trees are the components that regulate environmental conditions such as relative humidity and keeps temperature stable with regard to temperature variations. Here different types of trees can be used and it has a density of between 20 and 50 trees per ha, or any semi-permanent shrub species like banana, with a number of plants between 300 and 750 sites per ha.

Technified production system:
A lot of coffee with the Caturra or Castillo variety, cultivated grown towards the sun or with regulated shade. This one has a plantation of no more than 2,500 plants per ha.

Shade coffee production system:
With this one any permanent tree species can be used, with a density greater than 50 trees per ha, and a planting distance of 14 x 14 m.
As a general data, the regulation of light is generally used in those regions where water deficit and high temperatures occur. For this system, plants with more economic value are commonly used, also called productive shade, as a way to reduce production costs and an option to diversify income.

Type of coffee cultivated in Colombia

Although in Colombia the entire process of harvesting Arabica coffees predominates, which are characterized for producing a smooth beverage. Not all types of coffee beans are the same. The great diversity of the country allows this type of bean to have an easy adaptation, different flavor profiles, and diverse production seasons. Thus, among the types we find:

Caturra:

Produces less than Borbón, but is superior to Típica. Its performance in the entire coffee-growing region is optimal.

Típica:

It has a high percentage of large grains compared to Caturra and Borbón. Up to 2,500 plants per hectare can be planted.

Borbón:

In general, it has a greater number of branches than Típica and produces up to 30% more. For this variety, up to 2,500 trees per hectare can be planted.

Castillo Variety:

It is similar to the Caturra variety in terms of the size and shape of the tree. Its heart has a more tanned appearance and the quality of the bean is similar to the other types of Arabica coffee.

Tabi:

It is derived from the crossings between Tipica and Bourbon. Its bean is 80% superior to the supreme coffee. It is considered to be one of the highest-quality coffees and is resistant to certain species of fungi.

Maragogipe:

Also known as 'elephant coffee beans', it is recognized for being a warm, soft and perfumed product for the palate. Its production worldwide is limited due to the special climatic conditions in which it is produced, making it a coffee that is highly demanded by experts.

The differences in the flavor profiles come from these varieties, as well as from the methods of production, processing, and preparation styles.

Fig 21. Cottonbro Studio

4.2.3 Specialty coffee programs

At an international level, the specialty coffee market emerged in the decade of the 1960s, as a response to the coffee consumers of the United States, who were looking for a higher quality beverage in a market where the product was very homogenized. In the case of Colombia, this movement arose as an attractive differentiation strategy for consumers worldwide and for which they were willing to pay a higher price.

Colombia has occupied a very prominent role in the market of high-quality specialty coffees thanks to the promotion and publicity that has been given to the consumption of pure Colombian coffees.

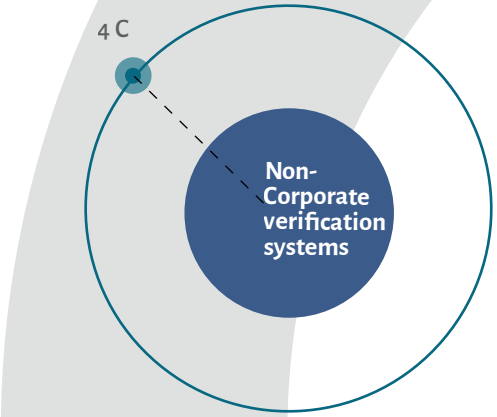
With the purpose of increasing the positioning of coffee in the segment of the so-called "Specialty Coffees", the FNC in 1986 created a program of Colombian Specialty Coffees; which has as its objective the identification and selection of coffees from specific regions with particular characteristics (FNC, 2007).

Specialty coffees according to Archila. P et al. (2007) are those coffees of excellent quality, that maintain consistency in their physical properties, referring to their shape, size, humidity and appearance, sensorial referring to their olfactory, visual and taste characteristics; in their cultural practices referring to methods of harvesting, washing, drying and in their final forms of preparation (p. 240). In this sense, Colombian specialty coffees are divided into three categories:

1. Coffees of origin: Coffees that come from a country, region or farm, with unique qualities, since they grow in special places, and are sold to the final consumer without being mixed with coffees of other qualities or with coffees of other origins. These are classified into regional coffees, exotic coffees and estate coffees.

2. Sustainable Coffees: These are coffees cultivated under a serious commitment to the care of the environment through clean production and the conservation of biodiversity in their zones. This promotes the social and economic development of coffee-growing families, promoting a fair market. These are classified into conservation coffees, which promote social relations, and organic coffees.

3. Preparation Coffees: Coffees with a special appearance, either because of their size or their shape, which makes them more attractive in the international market. In this category also belong the coffees that are sought after according to the preferences of a particular client and are combined to offer a consistent product. These are divided into Selecto, Supremo and Caracol coffees.



Verification and certification systems applied in colombia

Verification/ certification programs

Seals for Sustainable Specialty Coffees used in Colombia

Context delimitation

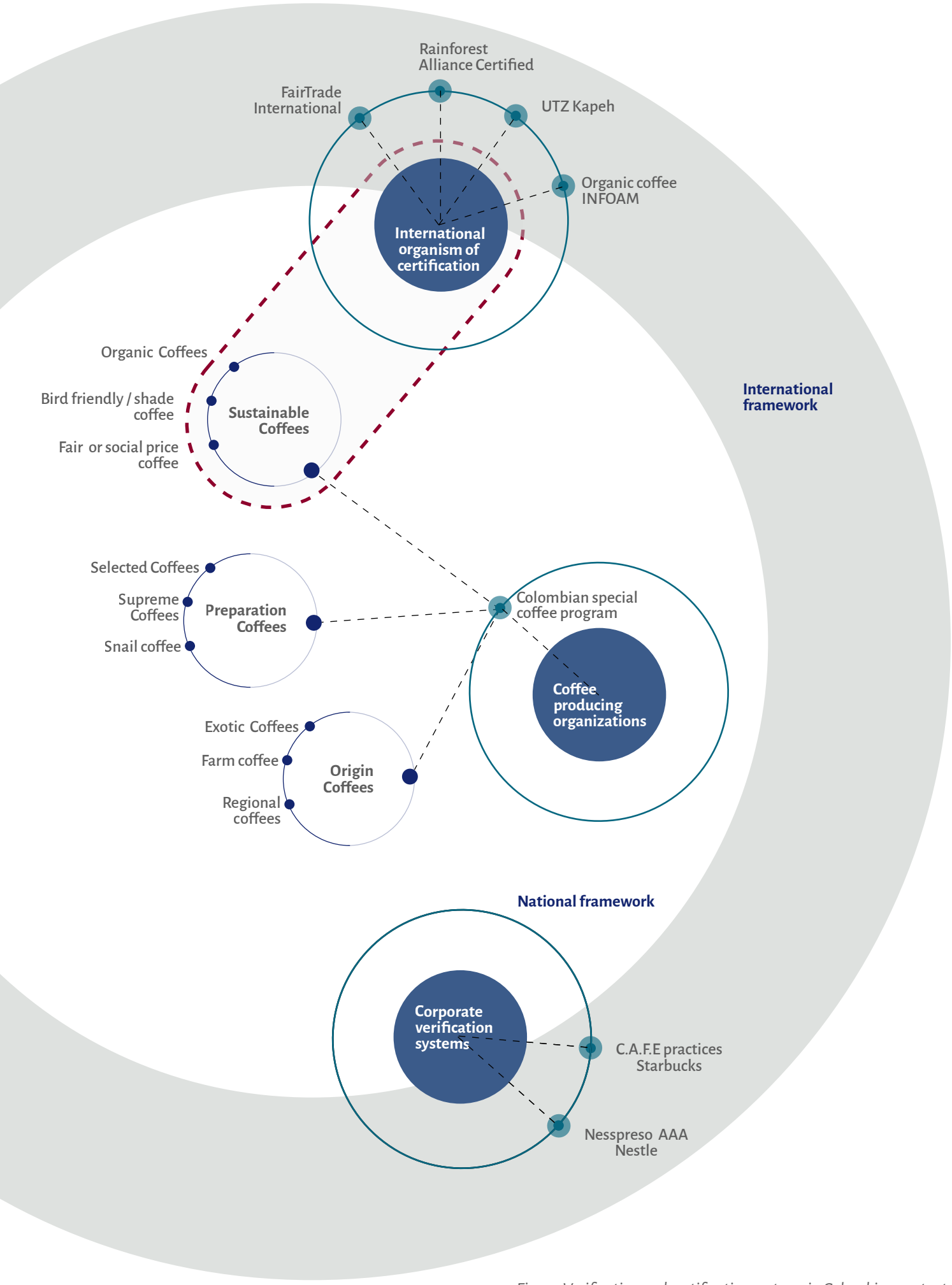


Fig 22. Verification and certification systems in Colombian context.

4.2.5 Institutions

A key aspect to understand the Colombian coffee sector is to know the different institutions that have been in charge of organizing, regulating and commercializing the coffee activity in the country. These institutions have been covering the different phases of the productive and commercial chain. Articulated under institution: **The National Federation of Coffee Growers of Colombia, FNC.**

This institution is the most important within the country's coffee sector. Founded in 1927 as a result of the union of numerous coffee producers seeking stronger national and international representation, as well as the formation of an organization to oversee the well-being and quality of life of the country's coffee-growing families. The FNC is an NGO not affiliated with any political party and is regarded as one of the world's largest rural groups, with operations in China, the United States, Holland, and Japan. Within the functions and tasks of the FNC and as stated on their official website, the following can be highlighted:

Offering the purchase guarantee to the coffee farmers:

Coffee growers are guaranteed that all of their products are purchased at market prices. This is done through cooperatives that reach all the coffee-growing zones of the country, saving the producers the task of commercializing their products in the ever-changing coffee market.

Promote the consumption of Colombian coffee:

Position Colombian coffee as an excellent consuming experience in national and international markets since it is a product that potential commercial clients and consumers want. This is due to its excellent quality standards, as well as the fascinating stories of Colombian coffee-growing families.

Research and technology transfer:

Colombian coffee growers have the National Coffee Research Center (Cenicafé), which focuses on scientific and technical research as well as competitive and generates sustainable technologies aimed at increasing the productivity, competitiveness, and profitability of the entire sector, and which is transferred to all coffee growers via the Extension Service.

Fig 23. Fabrica BuenCafe, Chinchiná, 2010

Develop rural extension:

To improve working and living conditions constantly, the Extension Service also transfers technological innovation to coffee growers and aids in the improvement of the overall crop profitability and performance, and therefore in living conditions as well.

Manage alliances and projects with excellence:

The FNC designs and executes projects set to further develop families' knowledge on social, environmental and legal, orienting them through a network of both private and public entities responsible for said initiatives

Guarantee the quality of Colombian coffee:

The FNC is responsible for regulating the coffee factories and machinery and is also in charge of the National Coffee Exporters Registry.

Among the other coffee institutions associated with the FNC are:

Buencafé:

Starting its operation in 1973, Buencafé specializes in freeze-drying coffee processing and also exporting high-quality lyophilized coffee to markets on all continents. Its specialty is soluble coffee, which is one of the most competitive in the national market. The company is gradually transitioning to a sustainable model on all levels, from packaging to waste management based on coffee biomass boilers and the use of rainwater in its industrial processes, making it one of the first to introduce circularity into its operation.

Agrocafé:

Agroinsumos del Café, founded in 1999 by a coffee farmers' cooperative and the FNC, is a corporation that assists in the marketing of agricultural inputs. It is the most significant Colombian firm in terms of experience in coffee plant nutrition, which includes everything involved in fertilizing and caring for a coffee crop. It is the FNC link that advises coffee producers not just on fertilizer and input choices, but also on the maintenance of proper agricultural practices.

Juan Valdez Café:

In 2002, the brand was created under the premise of promoting Colombian coffee not only through high-quality coffee products but also with a strong branding and marketing strategy.

Cafecert:

The Foundation for the Certification of Colombian Coffee is in charge of certifying coffee products derived from Colombian coffee. They are the bridge between coffee farmers, small and big companies and coffee brands, and the FNC to obtain the right to label their products under the Denomination of Origin Colombian coffee seal (including regional labels), managing the intellectual property procedures and granting higher competitivity in international markets.

Cenicafé:

The National Coffee Research Center (CENICAFE) is the leading entity in scientific and technological research in the coffee sector and one of the best food research centers in the world. Created in 1938 by the FNC, CENICAFÉ studies the production of coffee farms and is in charge of developing technical proposals in the face of climatic variability in order to diminish the possible alterations in productivity, consolidate the sustainability of the coffee environment and facilitate the adaptation of the crops to the changing conditions of world coffee consumption, all through the Extension Service.

Echological Coffee Foundation (FEC):

Established in 1997, the Foundation develops social-environmental focused projects and initiatives carried out with the coffee regions' families, collaborating with entities from those municipalities and social institutes.

CRECE:

It is a research center founded in 1986 in charge of producing useful knowledge for other national or regional entities to design projects, initiatives and alliances for the development of agricultural regions and to combat poverty in rural areas of the country. To this end, CRECE works especially in four lines of research: regional development, coffee economy, social and institutional development. However, CRECE has gradually become a propositional entity, also evaluating policies and programs that include productivity and sustainability, but also from the human factor (health, gender, etc.) and living conditions (housing).

The Coffee Cultural Landscape (CCL):

UNESCO designated the Coffee Cultural Landscape, or CCLC, as a World Heritage Site in 2011, encompassing the departments of Caldas, Quindio, Risaralda, and the northern Valle del Cauca. Although it is not the only coffee-growing region in the country, it is the only one that now enjoys this level of recognition.

Manuel Mejía Foundation (FMM):

Named after an important coffee community leader, the foundation is a private, non-profit organization established in 1960, dedicated mainly to education for work and human development, providing training to inhabitants of the rural sector.

Almacafé:

The FNC's general coffee storage and logistics branch. It is a corporation that was started in 1965 and has established itself as a vital ally of coffee producers due to the services it provides. Its service range includes threshing, roasting, milling, and packing, as well as everything related to port logistics, reception, storage, and customs clearance, as well as import and export processing. It is one of the entities that add higher economic value and helps to keep product standards at the pinnacle of the ever-changing coffee industry. In addition to the foregoing, Almacafé is the country's first 4PL logistics operator.

Parque Del Café:

A thematic park built on the Colombian coffee culture, its heritage and the traditions of the sector. It includes an explanatory tour of the infrastructure and the coffee cultivation and production process, offering an educational experience to visitors.

The Extension Service, established in 1928, is the mechanism through which the FNC reaches coffee farmers to diffuse innovative practices and guides families to improve the quality of their productive activity. Each member of the Extension Service's personnel, known as the "yellow shirts", is assigned the assistance of a number of coffee farms; they establish strong bonds with the farmers, acting as a technical ally. They inform on the latest research done by Cenicafé and support the growing stages and capacitation of new coffee farmers.

The fundamental asset of the FNC to fund its entire operation and develop all the initiatives of its cooperative network is the National Coffee Fund (fNC), a parafiscal account for budgetary resources managed by the FNC, and in which the government participates in financial decision-making. It is primarily supported by coffee contributions paid for each pound of coffee exported, royalties for the use of the coffee trademark, and coffee commercialization. This enables the financing of public goods and services that benefit all Colombian coffee producers, such as purchase guarantees, scientific and technological research, Extension Service, as well as promotion and commercialization operations. It is supported by the coffee donation, royalties for the use of the coffee trademark, and coffee commercialization. The FNC's resources are audited by the Comptroller's office every year.

Fig 24. FNC, 2021

05

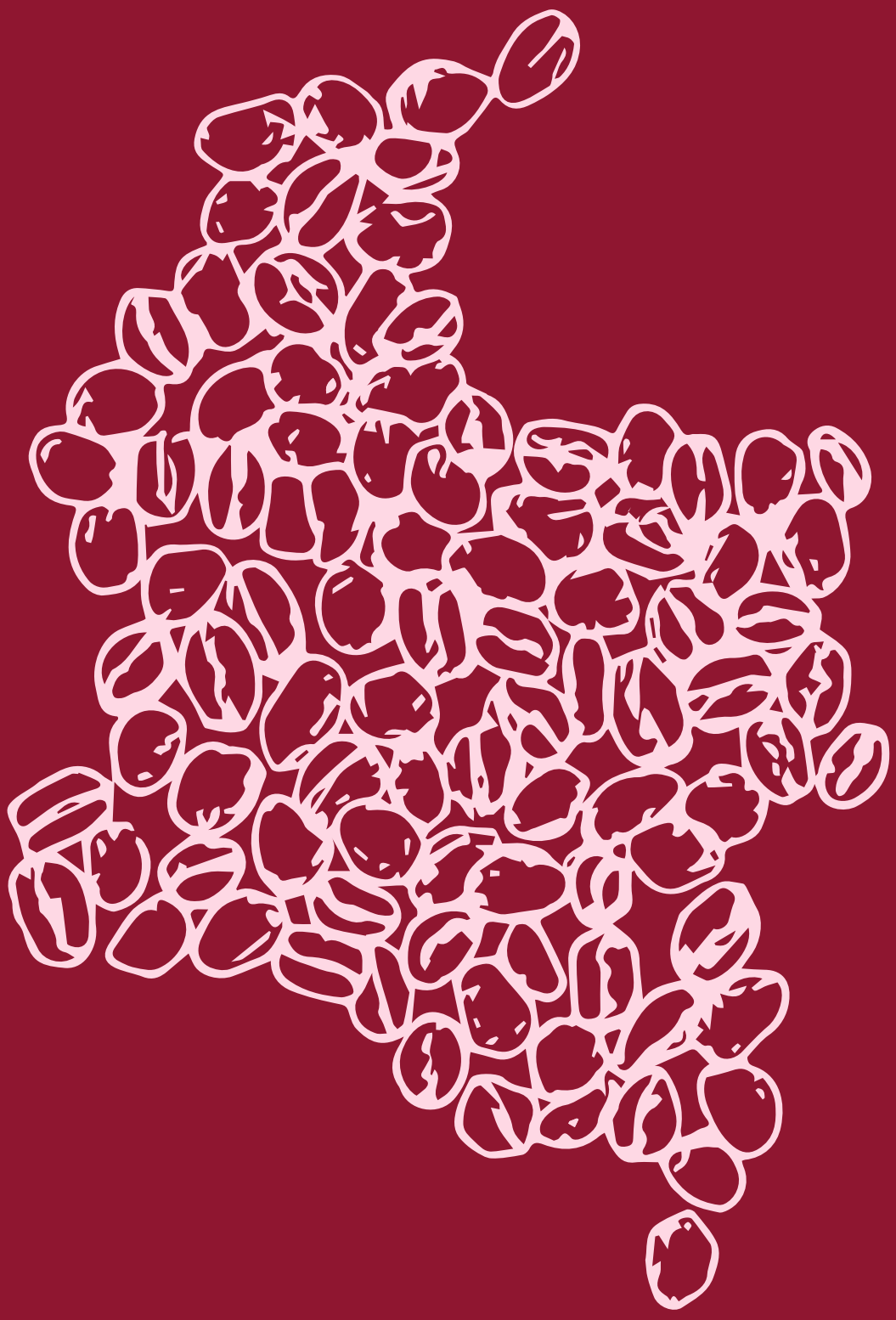
Context analysis: Inside Colombia's coffee production

5.1 Productive chain

5.2 Stakeholders

5.3 Holistic diagnosis

5.4 Giga map



5.1 Productive chain

A systemic intervention derives from an understanding of the parts as a whole, which is why for a holistic perspective coffee must be analyzed from bean to cup. In previous chapters we have delved into the social, economic and cultural aspects of the coffee sector, now it is time to get to know what happens behind the scenes, in the coffee production.

The type of grain that is marketed varies according to the production method, but there are 6 basic stages.These small variations are contained therein, that's why the analysis will be from a general view to understand the inputs and outputs of the system.

Germination and seedling

This phase takes place outside the plantation fields because the seed germination needs a smaller and controlled environment. They are sown individually and then transferred; one of the critical points in this phase is precisely the transition from one space to another, as in the intermediate stage there is a high waste of plastic bags that normally contain the seed while it is germinating. This can be considered a problem since waste treatment in rural areas is limited, so that waste normally ends up in landfill whose emissions significantly pollute the atmosphere.

On the other hand, this is one of the phases with the highest water consumption.This does not represent a major problem thanks to the attention given by the coffee growers, because the water is normally obtained from rivers or from rainwater collection, so it can be considered a circular model.

Fertilizers are needed both at seedling and further steps, and it is normally organic fertilizers are recommended, considering that organic waste is one of the outputs of seedling, the best alternative to exploit their remaining properties is to establish a circular model.

Soil preparation

The aim of this section is to prepare soil conditions for an adequate plant growth, which implies the production of solid waste such as construction material, plastics and weeds. In this case waste management is a critical issue because there's no feasibility for the farmer and additionally the access to an adequate waste treatment service is limited.

Crop growth

The activities at this stage are mainly oriented towards the maintenance of the crop, which is why we find so many fertilizers and chemicals to promote growth and pest control among the inputs. The coffee grower plays an active role, as he/she is in charge of managing these activities, as they are decisive for obtaining an effective harvest in terms of quantity and quality.

Furthermore, the amount of wastewater is considerable, the problem is that this waste is partially contaminated and currently ends up in water bodies or even on the soil, which in addition to not being an ideal treatment, can affect the crop if it is contained in large quantities, which would increase the likelihood of the spread of bacteria.

Crop growth

The activities at this stage are mainly oriented towards the maintenance of the crop, which is why among the inputs we find so many fertilizers and chemicals to assist growth and pest control. The coffee grower plays an active role, as he/she is in charge of managing these activities, as they are decisive for obtaining an effective harvest in terms of quantity and quality.

Harvesting

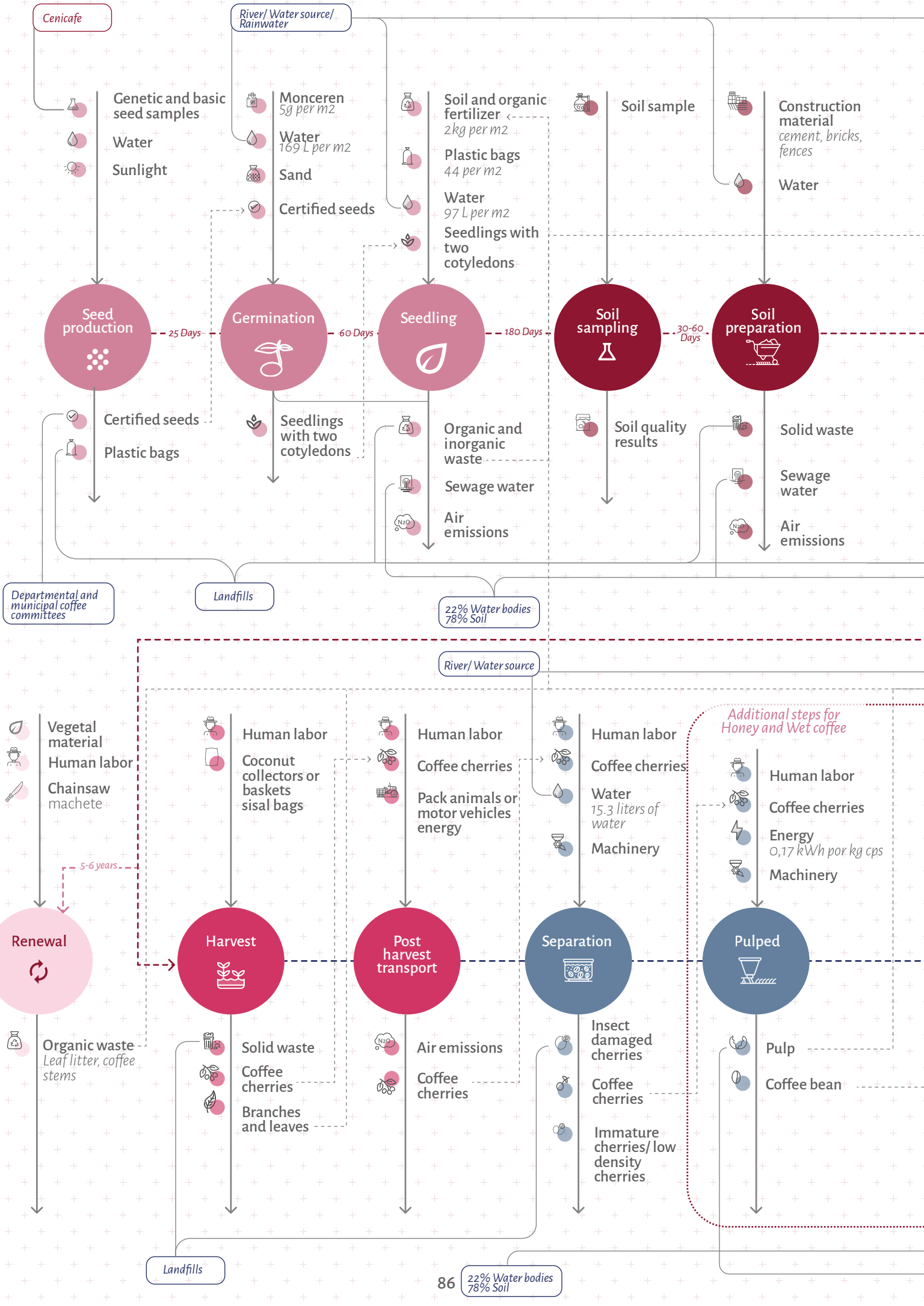
This phase has few activities but it is crucial one being the transition between cultivation and production, its environmental footprint is smaller than other phases and even its organic outputs can be reintegrated into the chain, supporting the circular waste model.

Post-harvest processing

When the pulping and fermentation steps are carried out, wastes such as pulp and mucilage are normally used as animal feed, however, a correct treatment can increase the alternative products that can be created from these wastes.

As mentioned above, the type of coffee varies depending on changes in the process, it is in this section where, according to the steps realized, three types of coffee can be obtained: Honey, wet and dry. Analyzing the inputs and outputs of each type of coffee, the dry one has the biggest impact between them, because in addition to the high water volumes required, the extra steps accumulate more organic waste than the other two types of coffee.

Trite: In the final stage, being the coffee that is marketed the output from the threshing and sorting the waste decreases. Even organic waste is low compared to other stages of the chain.


Cenicafe
River/ Water source/ Rainwater
Genetic and basic seed samples
Water
Sunlight
Monceren 5g per m2
Water 169 L per m2
Sand
Certified seeds
Soil and organic fertilizer 2kg per m2
Plastic bags 44 per m2
Water 97 L per m2
Seedlings with two cotyledons
Soil sample
Construction material cement, bricks, fences
Water
Seed production
25 Days
Germination
60 Days
Seedling
180 Days
Soil sampling
30-60 Days
Soil preparation
Certified seeds
Plastic bags
Seedlings with two cotyledons
Organic and inorganic waste
Sewage water
Air emissions
Soil quality results
Solid waste
Sewage water
Air emissions
Departmental and municipal coffee committees
Landfills
22% Water bodies 78% Soil
River/ Water source
Vegetal material
Human labor
Chainsaw machete
Human labor
Coconut collectors or baskets sisal bags
Human labor
Coffee cherries
Pack animals or motor vehicles energy
Human labor
Coffee cherries
Water 15.3 liters of water
Machinery
Additional steps for Honey and Wet coffee
Human labor
Coffee cherries
Energy 0,17 kWh por kg cps
Machinery
5-6 years
Renewal
Harvest
Post harvest transport
Separation
Pulped
Organic waste Leaf litter, coffee stems
Solid waste
Coffee cherries
Branches and leaves
Air emissions
Coffee cherries
Insect damaged cherries
Coffee cherries
Immature cherries/ low density cherries
Pulp
Coffee bean
Landfills
22% Water bodies 78% Soil

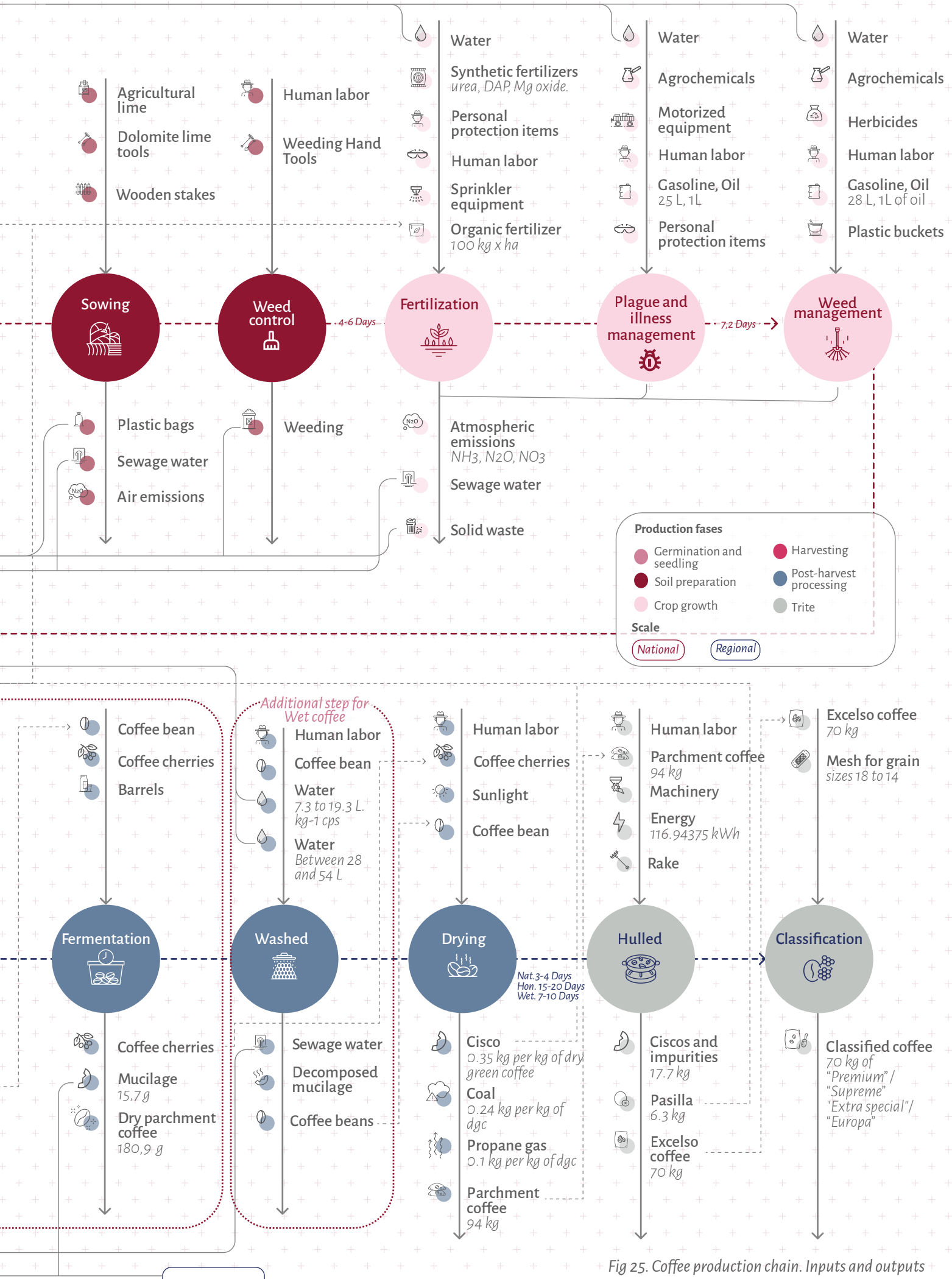


Fig 25. Coffee production chain. Inputs and outputs

5.2 Stakeholders

Understanding the flows between stakeholders clarifies a few things. Firstly, it allows to identify key activities outside of coffee production and therefore pointing out the different dependencies and overall the influence some actors have on the system and smaller agents understanding the impact through an evaluation of the quantity of power and interest that each actor has in the development of the coffee sector. Secondly, it locates with high precision where waste and other outputs are generated so they can be used further in the project development.

Flowchart

With the flow mapping, it is possible to identify third parties or agents that don't add value to the industry, so the new system excludes them or integrates them in a way they are useful and included to the extent that their transformation contributes value to the chain. As mentioned in section 4.2.4 , the Colombian coffee system is articulated by the different entities that make the FNC.

As shown in the map, some conclusions are evident:

- There is no direct interaction between cafeteros and coffee consumers, creating a breach that allows third parties to act as a bridge.
- There´s a constant feedback channel from the cafetero families to the Federation through the figure of the coffee farmers' representative, who communicates to the municipal and departmental committees the concerns, worries and in general the point of view of the coffee growing families.
- There's an evident lack of recognition by cultural and heritage entities outside of the Coffee Cultural Landscape.
- Technical-driven institutions haven't tackled waste management-derived problems, helping mostly the productive efficiency with machinery and proper techniques.
- Although families are principal stakeholders, there's no role for the next generation of coffee farmers to play in the current system, having no logistic or decision-making responsibilities.

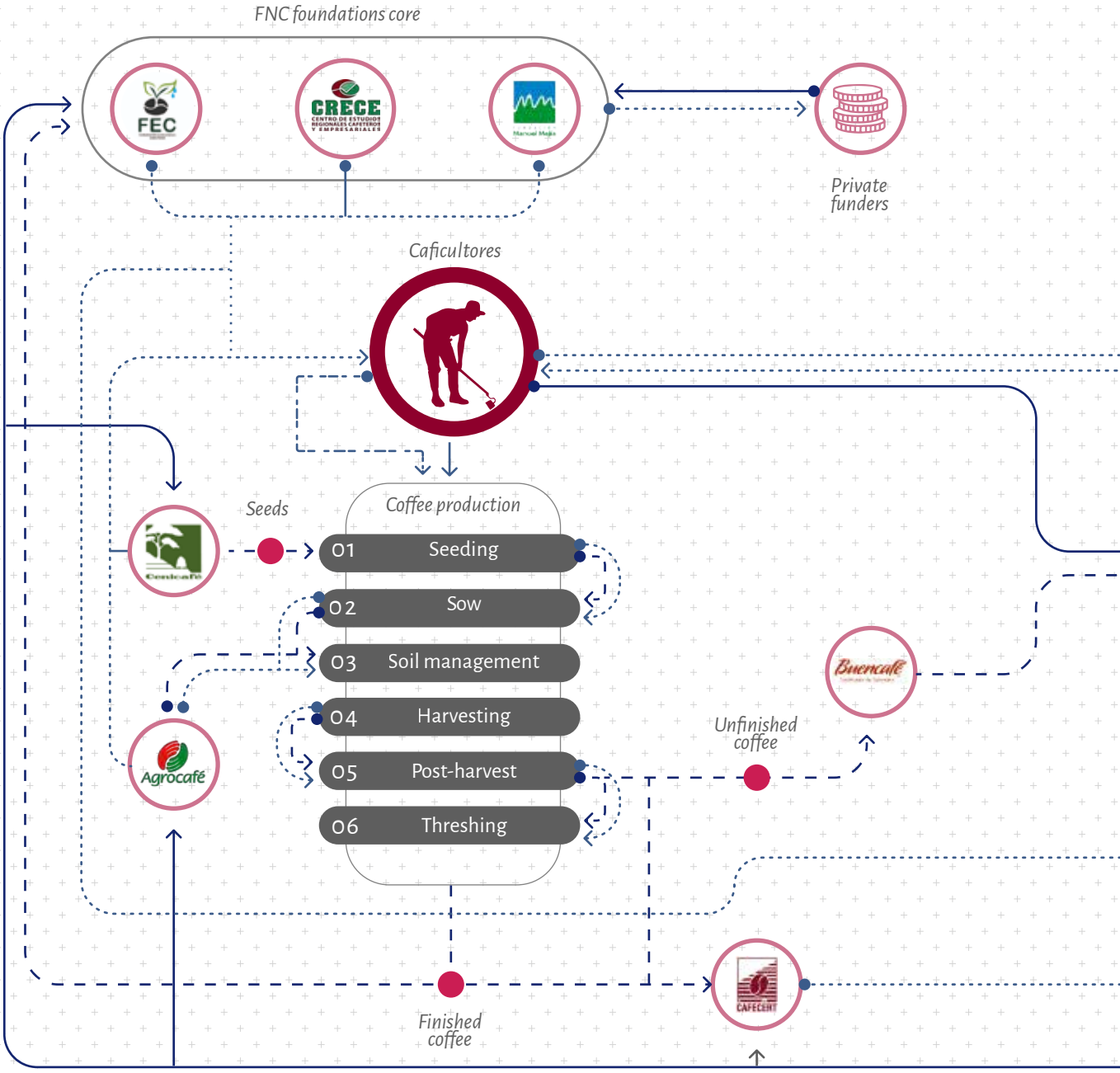
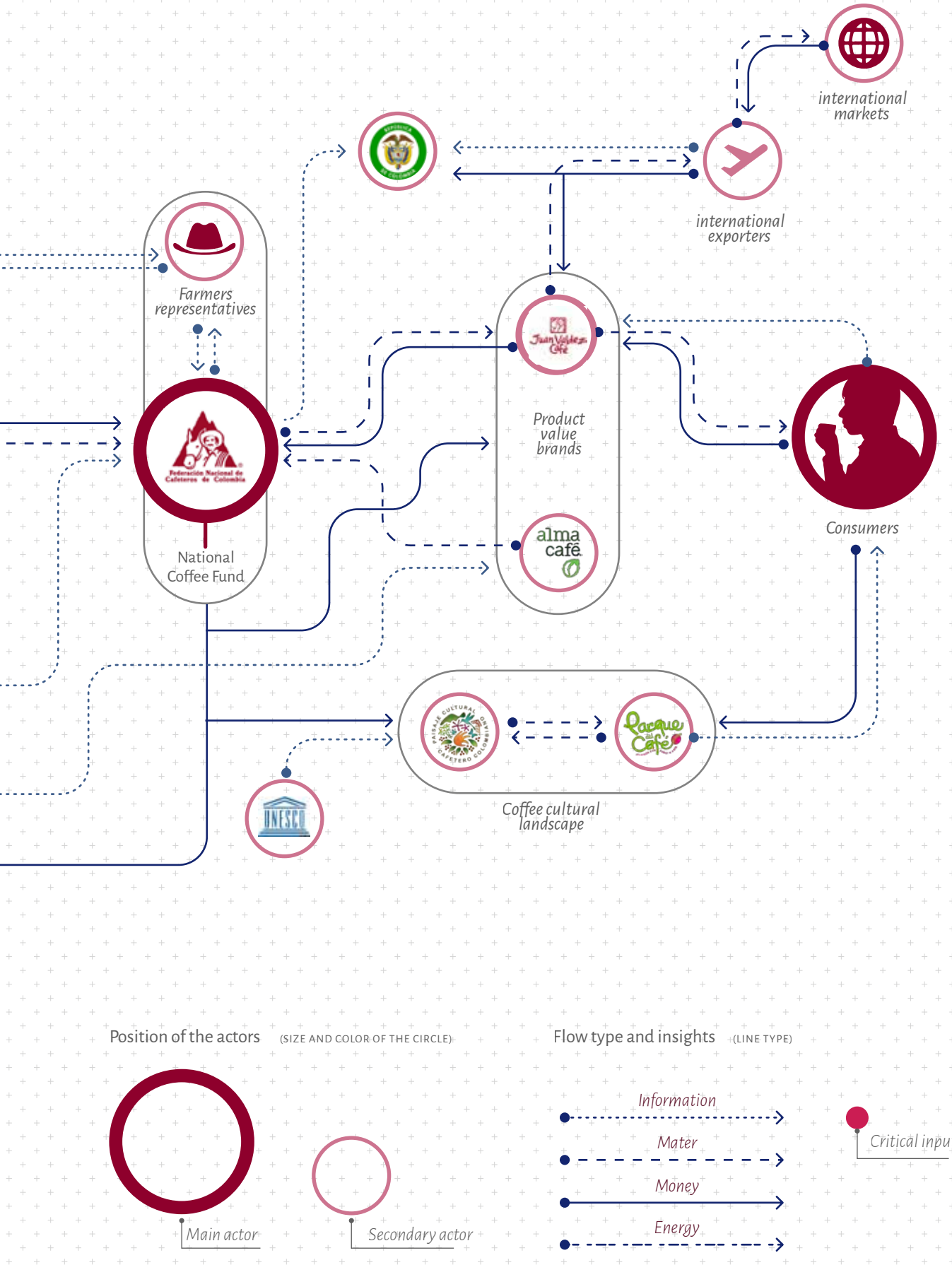


Fig 26. Flows and interactions of actors in the Colombian coffee system (fig. 26)


international markets
international exporters
Farmers representatives
Product value brands
Consumers
National Coffee Fund
Coffee cultural landscape
Position of the actors (SIZE AND COLOR OF THE CIRCLE)
Main actor
Secondary actor
Flow type and insights (LINE TYPE)
Information
Mater
Money
Energy
Critical input

Stakeholder map

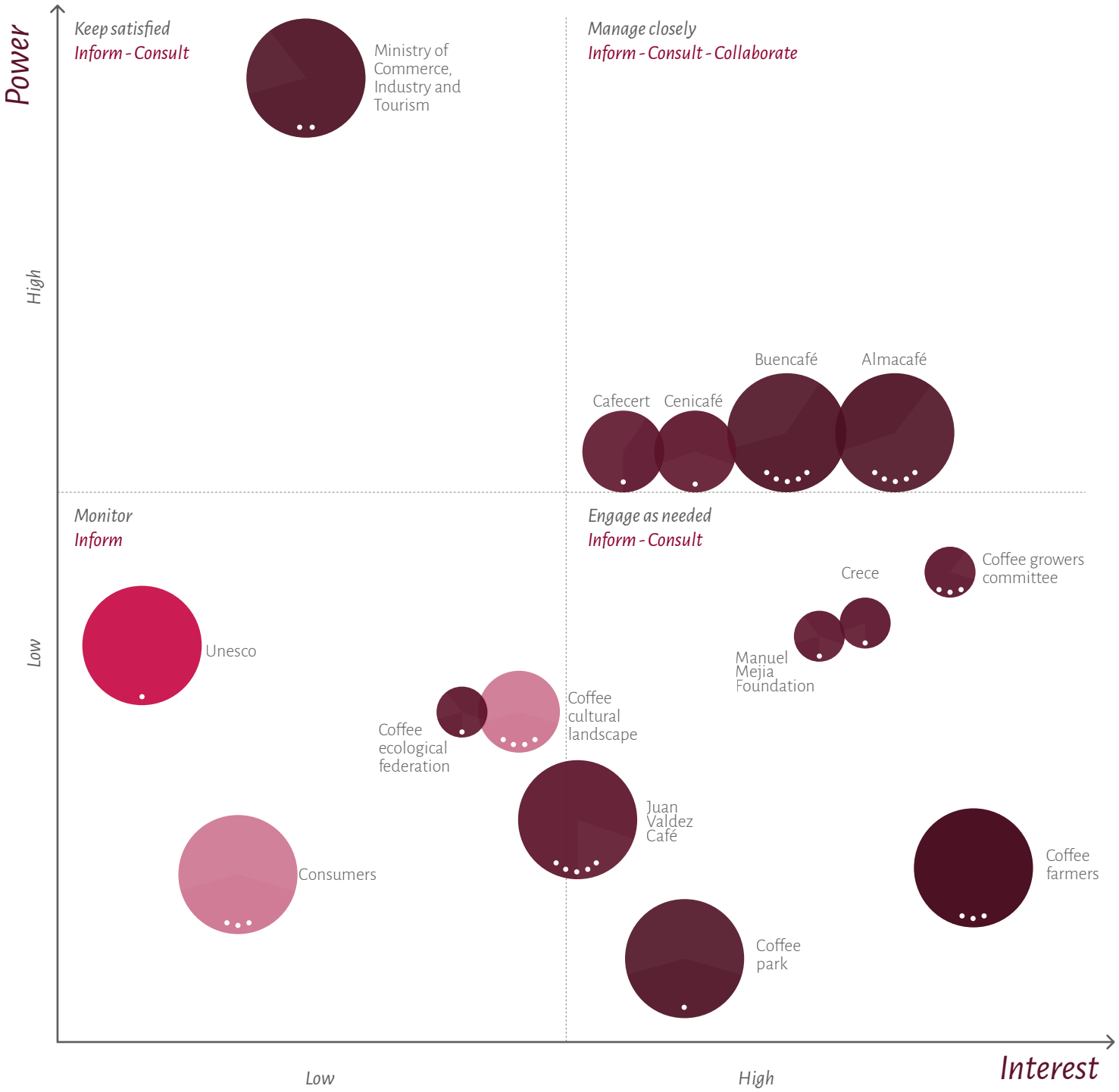
While mapping the interactions between the actors, the position of each actor's capacity in regards to the current system and the to be developed project. To transfer this information to the project level, it is now necessary to categorize the actors in the chain to understand their position of interest and power in the current system, taking into account the thesis' objectives. The systemic integration of these actors in the project is achieved through the identification of specific factors that allow us to understand the scope and impacts based on their competencies, duties and limitations.

In the general analysis we identified that a large part of the actors were genuinely interested in the sector's development, which suggests a positive outlook for the integration of a proposal that values the Colombian coffee sector as a whole, but their individual capacity is insufficient, due to the type of activity they are responsible for or the category they belong to, where in spite of having good ideas and specific know-how, they tend to lack the necessary economic factors to carry out the improvements they desire, as is the case of organizations and collectives. Knowing this, the possibility of an integrative strategy that supports the objectives of the project is even more tangible, since a correctly structured model could mean an increase in the power or capacity for collaboration in aspects that require attention in the chain.

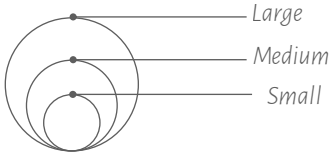
It is important to highlight stakeholders such as Manuel Mejia Foundation, Crece and Coffee growers committee detailed in chapter 4, who despite being small actors have a considerable level of power and participation, which has allowed them to carry out significant projects not only at a productive but also at a social level. This helps us to identify the type of support that the different stakeholders could provide in the project, since the factors of interest, power and utility are not always linked. Another example for this analysis would be UNESCO, who in spite of its location in the matrix, its recognition of the Coffee Cultural Landscape as world heritage was of great utility for the national coffee sector, as it has increased its value and recognition in the eyes of the consumer, which means a greater income from tourism and greater attention to its care and preservation.

Overall, the project proposal has to take advantage of stakeholders' strengths to effectively integrate the collaborative network and effectively achieve the set goals.

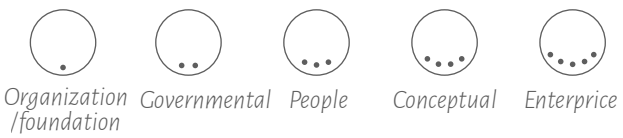
Fig 27. Stakeholder interest vs. power matrix. (fig. 27)



Dimension (SIZE OF THE CIRCLE)



Type (NO. OF INNER PERIMETER CIRCLES)



Geography (COLOR)

Goals (POSITION OF THE SHADED AREA)

5.3 HOLISTIC DIAGNOSIS

As we saw in the previous chapter, Colombia is a country where coffee plays a predominant role compared to other industries. The attention given to quality and sustainability aspects is considerably high thanks to the network of actors that support it, and it could even be said that it also receives a holistic approach as social, economic and cultural issues are addressed. Indeed, the coffee industry scenario is a complex system.

In order to reach a complete vision of the future new system it is imperative to perform a holistic diagnosis, as explained in chapter 3. As a result of this analysis, a giga map integrates all the information and provides a synthetic blueprint of the system and the research around it.

5.3.1 History

Coffee is part of our daily lives, but it hasn't always been that way. This is why it is important to understand its history in the country, as it went from being a small productive activity to one of the most iconic features of the nation. Since the Jesuits brought coffee to Colombia, for practical and even religious reasons, the plantations increased over the years until the country reached the global market by exporting the product in 1835. The reception was quite positive, mainly from the United States and European countries, as revealed by the significant increase of exports which was 10 times more after less than 50 years.

The transition of the century brought with it instability for the country, not only got through the separation from Panama but also international coffee prices suffered a significant decline which, according to Cafe de Colombia history article it meant the transfer of coffee leadership to the western zone where small producers production and recognition was favored.

Since coffee is already a primary product in Colombia, it is necessary to consider those who grow and produce it, which is why in 1927 the National Federation of Coffee Growers (FNC) was created, being the first of several organizations dedicated to coffee that were established to support its principles and methods over time, seeking the improvement through social, sustainable, and technical innovation without compromising the history that characterizes Colombian coffee.

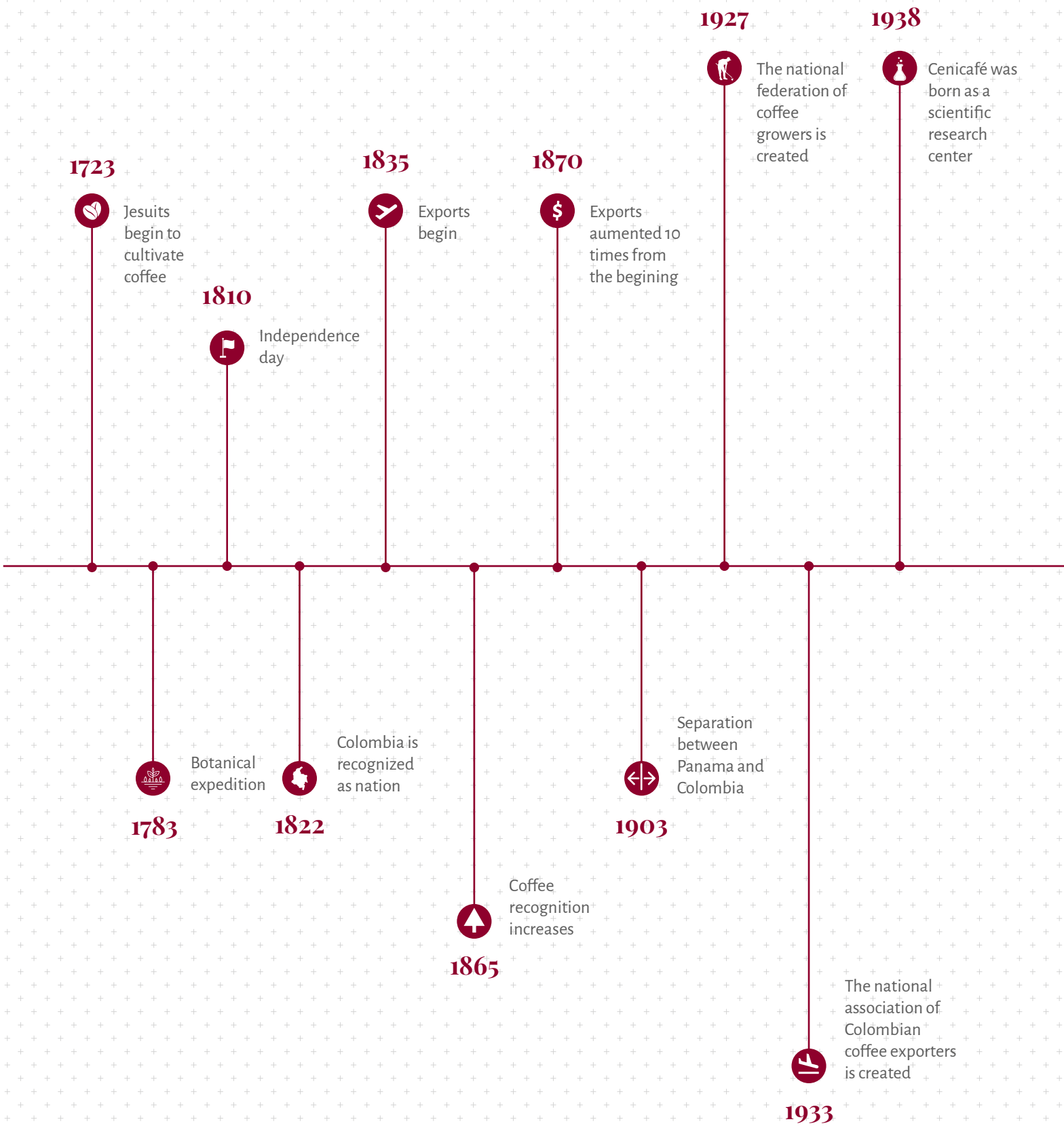
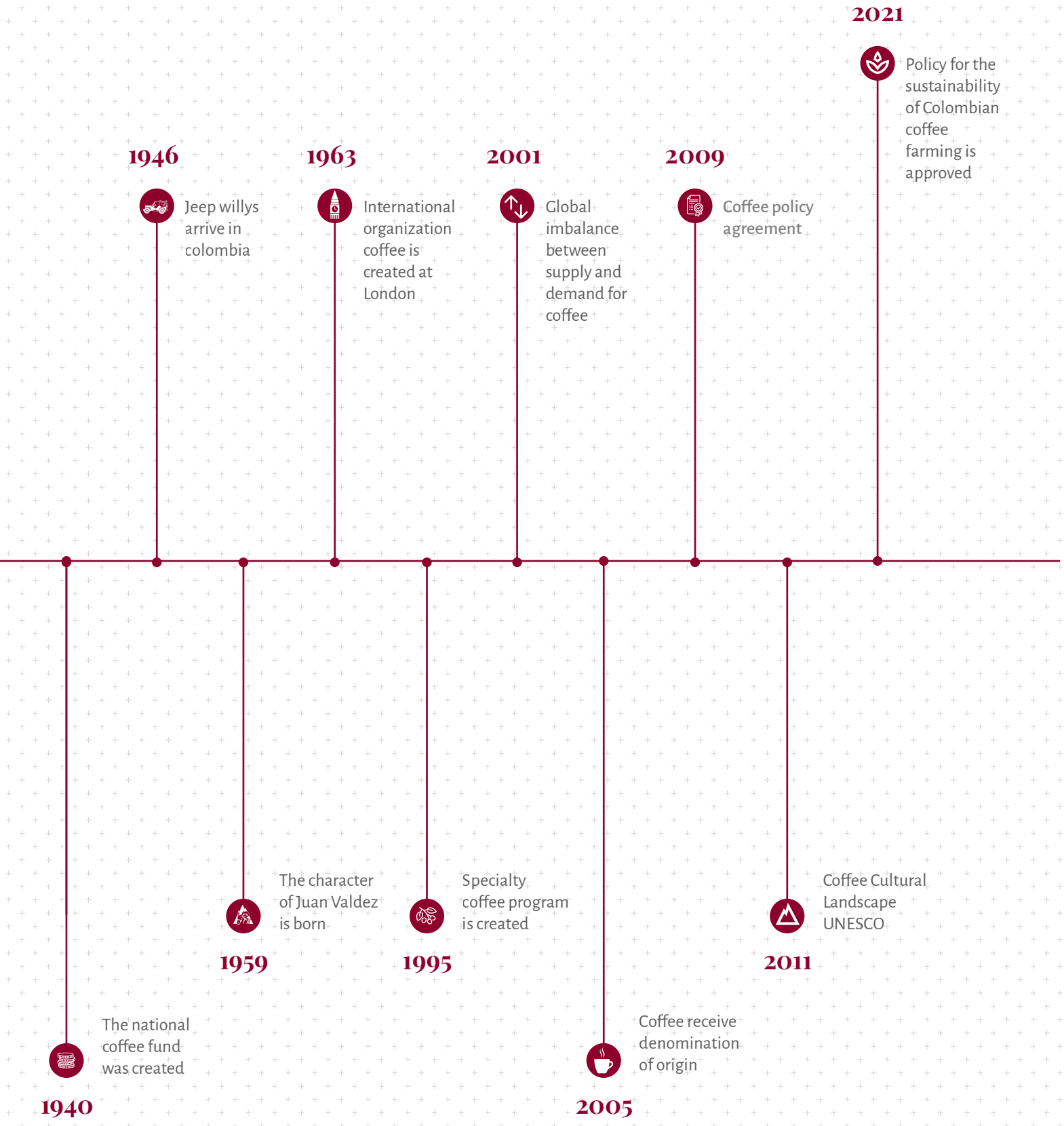


Fig 28. The history of coffee in Colombia (fig. 28)


1940
The national coffee fund was created
1946
Jeep willys arrive in colombia
1959
The character of Juan Valdez is born
1963
International organization coffee is created at London
1995
Specialty coffee program is created
2001
Global imbalance between supply and demand for coffee
2005
Coffee receive denomination of origin
2009
Coffee policy agreement
2011
Coffee Cultural Landscape UNESCO
2021
Policy for the sustainability of Colombian coffee farming is approved

Due to the country's altitude and relief, there are many different geographical conditions, particularly in the regions where coffee is grown, which is why, thanks to an excessive production of the Willys jeep in 1946 Colombia adopts a vehicle that will became the right hand of the coffee growers thanks to its physical and mechanical characteristics. Later in 1959 Juan Valdez was born, a character that represents worldwide the premium quality coffee 100% Colombian, in this way, the consumer can distinguish the origin of their coffee through a simple seal; it also seeks to be the face of coffee producers to the world in order to appreciate the work that goes into making a cup of coffee.

The coffee market oscillates between stability and growth, due to this national and international programs have been created to certify coffee and recognize its quality and origin. Programs such as the Special Coffee Program in Colombia in 1995, which as mentioned in chapter 4, was crucial for the nation and its coffee growers because it would imply a new market with more opportunities, was formed to encourage sustainable production and to elevate coffee to the next level of excellence recognized globally. This and other development topics continue to be dealt with over the years in meetings and summits held to support the valorization of the coffee industry and those who are part of it.

As a result, coffee has played a crucial role in the history and development of the nation. Beyond its economic importance, coffee has grown to symbolize the culture, perseverance, and overcoming of the Colombian people. Through organizations, groups, and programs that maintain what is not just an industry but also a way of life in motion, Colombia has been responsible for giving coffee its place as one of the country's most recognizable products throughout history.

“Coffee growing for me means peace, passion, love. It means the union of our family, our friends and our country”

Domingo Torres, 2022

Fig 29. Caio Mantovani, 2023

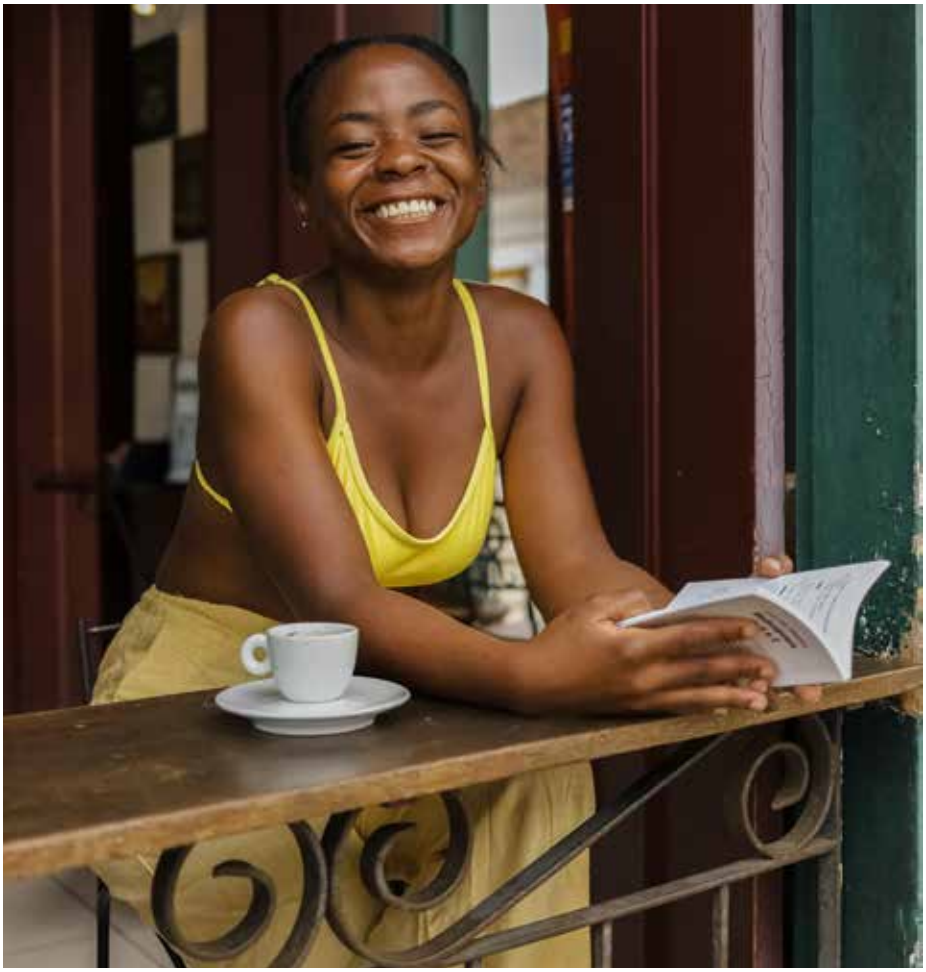


Fig 30. Frank Meriño, 2021

5.3.2 Culture

As mentioned in the previous chapter, in addition to being a product that contributes to the national economy, coffee is part of Colombians' daily life and routine. In the world coffee is consumed in different ways, none of which is correct or incorrect, it is a culture that transcends generations and crosses borders. In Colombia, for example, coffee has no time or place, it is accepted at any time of the day. From the typical breakfast of a Perico (Coffee with milk) with eggs and arepa, to an "envenenado" cup (coffee with aguardiente) to accompany a cold night or even a tinto (put reference coffee with aguardiente) after a family lunch. For this reason it is not difficult to believe that 41% of Colombians consume coffee from 2 to 3 times per day, which would be a total of 2.2 million bags of coffee per year as is mentioned by the study from infobae about how much coffee colombians consume. Even this consumption is divided into two groups: those who consume instant coffee (37%) and those who prefer ground coffee (63%), according to a survey carried out in the same study showing how a great part of the people have a preference for the pure product and tradition.

Colombia is known for its carnivals and celebrations, so it is logical to believe that one of its most symbolic products would receive an equivalent treatment. Indeed, the country has different events around coffee for all

Fig 31. Hermanos, Colombian coffee roasters, 2021

audiences: experts, novices, and coffee aficionados. There are events oriented towards theory and commerce whose function is to analyze the coffee offer including specialty coffees, to introduce innovation in the field and different actors working in the sector. There are events created specifically to develop an experience for consumers that offer pedagogic and learning spaces for coffee enthusiasts.

Coffee is mainly consumed as a beverage; there are even barista competitions, where skills, preparation and service for coffee business personnel are judged. These events are an important part of the coffee culture at a world level since it has put Colombian products and tradition on the map of potential new markets. This format has been used for three regional and one national championships in Colombia. There have been representatives of the country in world-stage competitions, with a first prize yet to come. However, Colombian coffee has always been the raw material with which the competition is held.

This brief context helps us understand the cultural significance that coffee has and that Colombians attribute to it, because it is a product with its own value that has not been lost over the years; rather, it has been collectively reinforced because as a community we believe in its significance and the development that it represents.

5.3.3 Demography

The FNC considers relevant the demographic analysis of coffee growers because it not only facilitates the micro-targeting of households, but also becomes a diagnostic tool for developing efficient actions to reduce vulnerabilities, that's why they present the Essay on Demography, social inclusion and poverty of coffee-growing households; It contributed to the research and data collection in the project, that's why in this subchapter data taken from this document will be presented for further analysis to get to know the whole picture in order to perform the holistic diagnosis.

One of the ways to define the coffee regions is the amount of producers that live in each department. Years ago the "Eje cafetero" was defined between the departments of Antioquia, Caldas, Risaralda, Quindio and Valle del Cauca, but according to the FNC for the year 2020 there were 540,362 coffee producers in the country, of which only 29% reside in these areas, which leads us to consider departments such as Cauca, Huila, Tolima and Nariño as main coffee producers in the country, since at least 50.9% of the coffee growers are located in these regions (2021).

The distribution of coffee growing families between rural and urban areas is a milestone that helps us to understand the context of the industry, because in spite of the fact that almost all of the families are

located in rural areas due to the practical access to the crops, 17.1% of the population lives in urban regions since their business model has advanced to the point where they can live off the resources of coffee and relocate to big cities.

The predominance in coffee-growing households is quite equitable, with a slightly higher number of men. This same proportion is found in the coffee industry because, despite the opportunities available, women and even young people do not perceive the coffee sector as a stable industry. For the same reason, the population of people who grow coffee is aging due to the high number of youngsters, who once they reach the age of majority, they move to the cities searching for study or work, leaving only those between the ages of 30 and 80 in the rural areas who are in charge of the region's coffee production.

Fig 32. Nuestros Caficultores. Our Farmers. Hermanos, Colombian coffee roasters, 2021

“The main thing is coffee, (...) because the farm is what gives us a living.”

Cenairo Alzate Muñoz, 2013

5.3.4 Geography

Geographically, Colombia's main coffee growing areas are divided into four clear regions. The northern region, the southern region, the central region and the eastern region, which will be explained in Profiling of coffee productive zones.

The temperatures of the coffee growing regions, with reliefs ranging from flat to mountainous, oscillate between 17 and 23°C, rainfall is around 2,000 millimeters per year and is distributed throughout the year. This favors the alternation between wet and dry seasons, which makes it possible to have up to two harvests in certain areas.

The soils of Colombian coffee plantations vary from sandy to stony to clayey, a good part of them derived from volcanic ash, which provides them with a high content of organic material and good physical characteristics for the production of coffee.

The plantations are located at altitudes between 1,200 and 1,800 meters above sea level, although it is also possible to find some farms above 1,950 meters, where the climate creates superior beans favoring an increase in their acidity.

Profiling of coffee productive zones

At first glance, Colombia may seem to be a country with greater homogeneity in its coffees than others. It produces only Arabica, the washing process predominates, and a large amount of its coffee grows in shade. However, not all beans are the same, the wide diversity that the country has, from its tropical jungles to its mountainous peaks, distributed among the 22 producing regions, allows us to find a great diversity in the flavor profiles, climates and harvesting seasons.

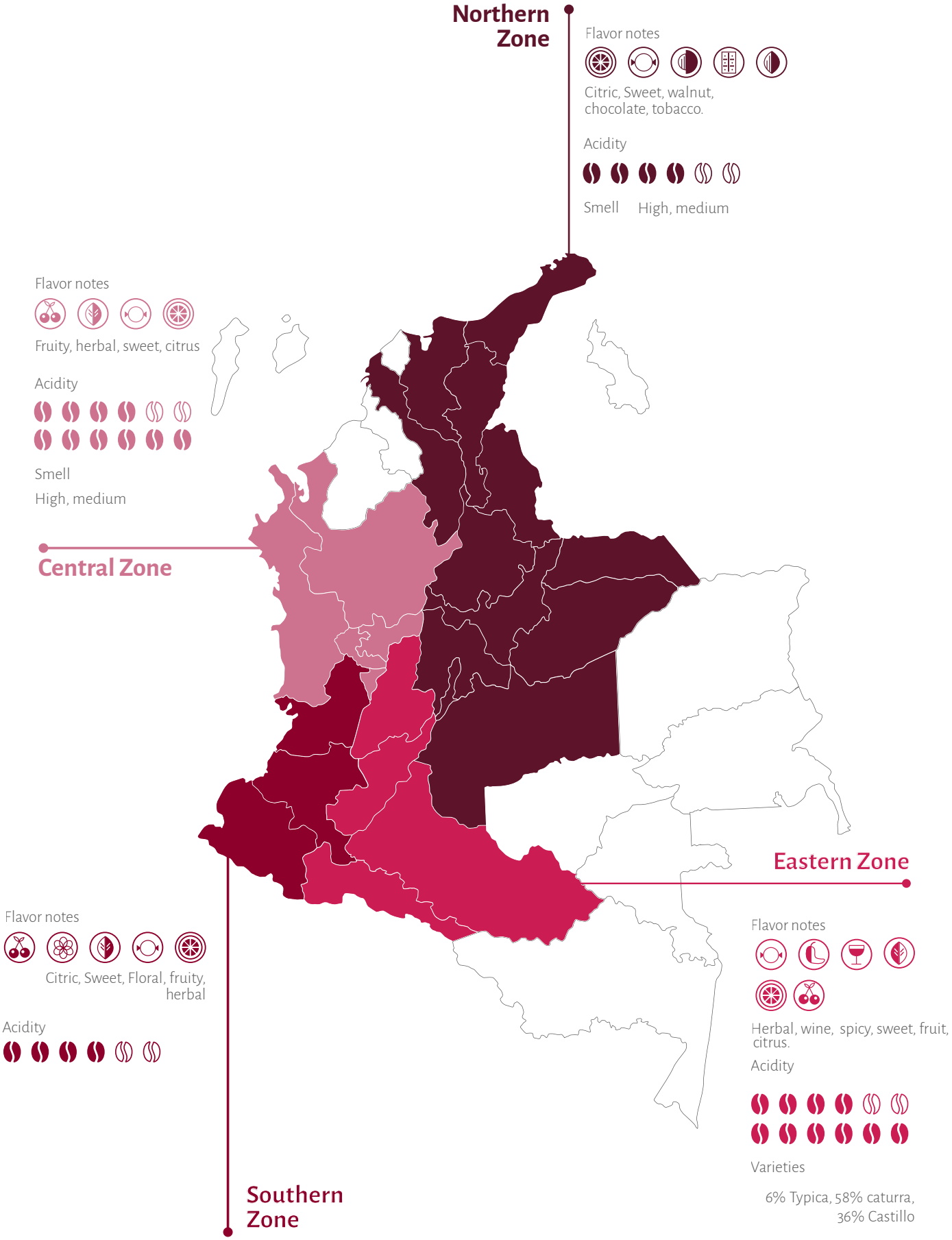


Fig 33. Profile of coffee productive zones

The coffee growing regions are distributed in:

Northern Zone.

In this group are the departments of Santander, Norte de Santander, Cesar, Bolivar, Magdalena and La Guajira. This zone has one dry season per year, from December to March, and one wet season per year, from April to November. The harvest season is from October to November.

The crops in this region, especially in the Sierra Nevada and Santander, are more exposed to solar radiation, therefore coffee growers tend to use more shade. According to the Colombian Coffee Growers Federation, these regions produce coffees with less acidity, but with more body.

Central Zone

This group includes the departments of Antioquia, Boyacá, Valle del Cauca, Choco, Cundinamarca, Tolima and the departments so well known for being the "coffee region" conformed by: Caldas, Risaralda and Quindío. This zone has two dry seasons per year, from December to February and June to September, and two wet seasons from March to May and September to November. Harvesting takes place between May-June and October-December. Antioquia is the second largest producing region in Colombia and Tolima is the third, which makes these two zones well known.

Southern Zone

This zone is conformed by the department of Putumayo and by the so-called "new coffee triangle" formed by Nariño, Cauca and Huila. These are not only large producers, but also coffee growing regions of the specialty industry. Huila received a Denomination of Origin in 2013, for its fruity and caramel notes, the sweet acidity and intense aromas characteristic of its coffees led to this recognition. The zone has a dry season from June to September and a wet season from October to May, with harvesting from April to June.

Eastern Zone

This group includes the departments of Arauca, Casanare, Meta and Caquetá. In terms of harvesting and dry and wet seasons, it functions similarly to the Northern zone.

This is a zone that has been in terms of priority over the last few years and has received support both for coffee growers and in the expansion of land for cultivation, in search of a transition to a sustainable economy with coffee in an area that was so affected by the conflict.

Colombia's advantage is based on the fact that it can afford to provide its clients with a variety of distinctive coffees throughout the year thanks to the alternation of harvests. Taking into account the differences between coffee producing zones, it can be understood that a cup of coffee from Antioquia is not the same as a cup of coffee from Meta.

5.3.5 Economy

According to the National Ministry of Agriculture, the coffee sector in Colombia represents 15% of the national agricultural GDP (2022) employs more than two million people, with a number of around 741,000 direct jobs and 1.4 million indirect jobs.

For 2020, in Colombia 848,789 hectares of coffee were registered, which were planted by an estimated 539,741 coffee growers, an average of 1.57 hectares per farmer. A percentage that demonstrates that coffee growing in the country is mostly based on peasant families with small extensions of land. And according to the FNC (2021) 90% of coffee farmers have an area less than or equal to 3.0 ha, and only 0.9% have extensions of more than 10.0 ha (p, 38).

Small producers (those with less than 5 hectares) have lower productivity and one of the most important components is that they have a family labor force. Their volume of production facilitates the control of the processes and opens the opportunity to sell higher quality coffees in the midst of a growing market due to the demand for coffees that are differentiated by their cup profile. For medium and large coffee growers the model is more focused on productivity with the idea of reaching the specialty coffee market.

Fig 34. Coffee Price volatility

Note. Adapted from "¿Por qué SUIZA hace más NEGOCIO con el CAFÉ que COLOMBIA?", 2021. https://www.youtube.com/watch?v=ZMBpO9lGNwk&ab_channel=VisualPolitik

Exports

Despite being the third largest producer worldwide, the Colombian coffee that goes abroad does not represent a significant profit in monetary terms. The export of coffee represents 0.7% of the national economy, which is very far from what happens with this product in non-producing countries, where companies such as the Swiss giant Nestlé get the great majority of profits from the export of coffee derived products. However, it is worth mentioning that this phenomenon occurs in other coffee producing countries such as Brazil, in whose economy coffee exports represent a low 0.3%. Due to the small landholdings of coffee growers, located many times in impoverished zones of the national territory and living off the daily production, it is almost impossible for coffee growers to invest in extending or improving their plantations, the latter being understood as the installation of equipment and machinery for threshing, roasting or packaging.

Fig 35. The coffee sector in Colombia.

COFFEE HISTORY IN COLOMBIA

- XVIII — French brings coffee to Colombia
- 1730 — Jesuits begin to cultivate coffee
- 1730 — The export of coffee begins

MAIN COFFEE ASSOCIATIONS

- 1927 — The National Federation of Coffee Growers is born
- 1933 — The Colombian National Association of Coffee Exports is created
- 1938 — Cenicafe was born as a scientific research center
- 1940 — The national coffee fund is created
- 1995 — The specialty coffee program is created
- 2005 — The coffee receives a denomination of origin

FLAVOR NOTES

Herbal, Wine, Spicy, Walnut, Chocolate, Citric, Fruit, Floral, Sweet

COFFEE PRODUCTION 2020

Quindio | Risaralda | Caldas

Medium producers 13,3%

48,8% Largest producers

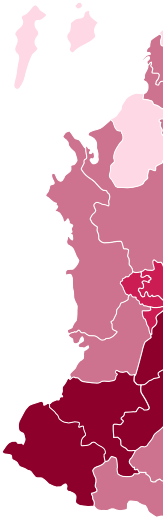
Huila | Tolima | Cauca | Nariño

Where is the coffee in Colombia?

22 of the 32

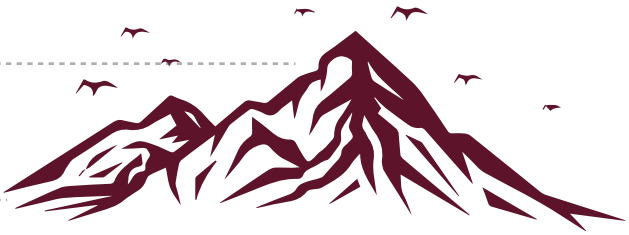
Non-producing departments

Coffee producing departments



How to grow coffee?

Rainfall close to 2,000 mm/year

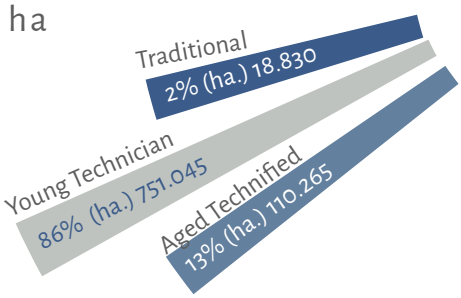


1,200 to 1,800 m above sea level

Temperatures between 17 - 23 °

5% Shade	33% Semi Shade	63% Sun
40.909	285.697	550.534

Total Coffee Area 877 ha



3 LARGEST PRODUCER OF COFFEE IN THE WORLD

of mild washed Arabica coffee

2.6 MILLION 60-KILO BAGS

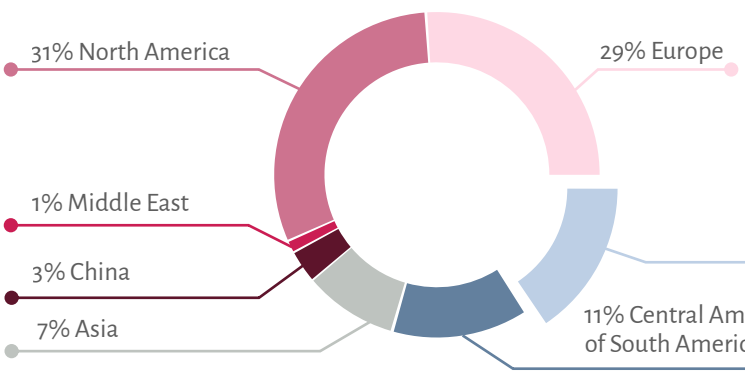
of green coffee

30 Coffee importer in the world *$3,22MM in coffee*

3 COFFEE EXPORTER IN THE WORLD *$203M in coffee*

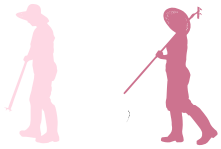
How colombians drink coffee?

WORLD MARKET DISTRIBUTION



The main destination of coffee exports from Colombia

- *$1,33MM*
- *$249M*
- *$247M*
- *$239M*
- *$221M*
- 18% Colombia



2.5

Giga Map Coffee In Colombia

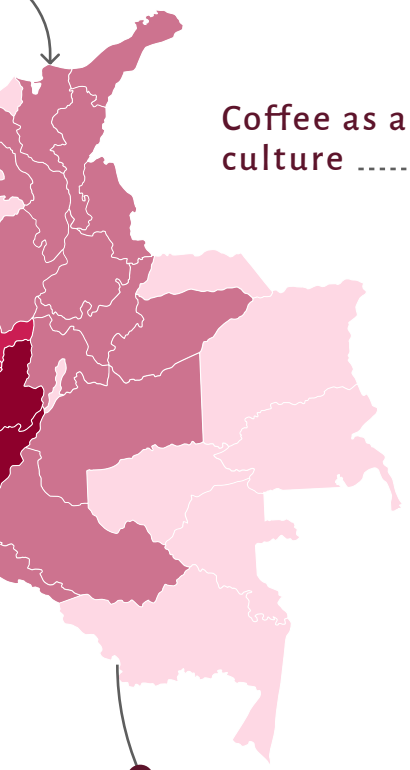
2011 UNESCO World Heritage The cultural landscape of coffee in Colombia

2021 Policy for the sustainability of Colombian coffee farming is approved

COLOMBIAN COFFEE DICTIONARY

Tinto: Black and dark coffee made in Greca
Perico/pintadito: Coffee with milk
Cafe envenenado: Coffee with aguardiente

Coffee as a culture



- Typica
- Bourbon
- Tabi
- Caturra
- Castillo
- Maragogipe

MAIN VARIETIES | Arabica coffee

COFFEE EVENTS IN COLOMBIA

- Commerce and theory oriented
- User and experience oriented

Coffee from Colombia Expo
Bogota, Special coffee productors

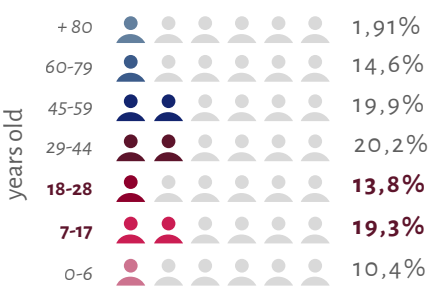
Expo Ejecafé
Quindio, great connoisseurs and experts.

Expo café Nariño
Nariño, Training, innovation and integration.

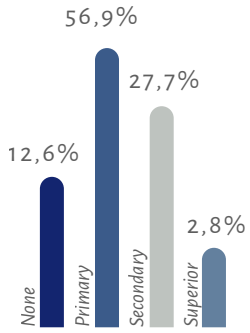
International Coffee, Cocoa and Agrotourism Fair
Huila, National and international coffee offer

Coffee Fest
Bogota, Discovery and Learning for Consumers

National Coffee Festival
Quindio, Focus on the typical wealth of coffee regions



AGE DISTRIBUTION



LITERACY AND EDUCATION

When and where drink coffee?

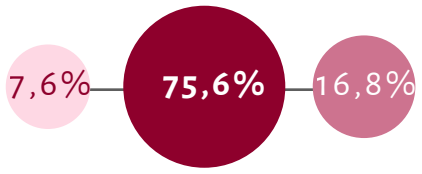
At all times in all places, there's no judgement

37% Instant coffee

63% Ground coffee

2.2 million bags of coffee per year

41% consume between 2 to 3 times a day



Headers | **Dispersed rural** | Populated center

Who are the coffee farmers?

MILLION JOBS (DIRECT AND INDIRECT)

51.6 million inhabitants in Colombia

546.382

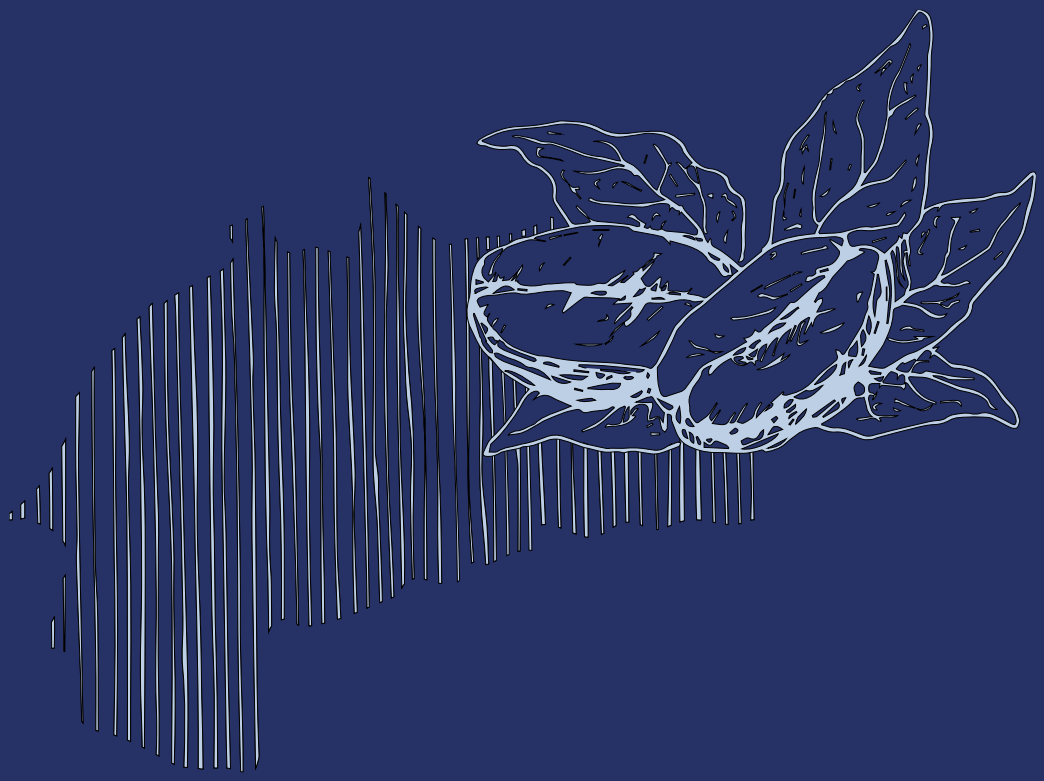
MORE THAN 25% of the country's rural population are coffee growers

06

Meta a land for new opportunities

6.1 Case study: Tierra Colombia - Meta Project

6.2 Analysis of the region



6.1 CASE STUDY: TIERRA COLOMBIA – META PROJECT

In 2015, the so-called "Piedemonte Llanero " region, in Meta, was the chosen scenario to carry out the "Tierra Colombia - Meta Project", as it is well known in Lavazza.
Carcafe Foundation and Fondazione Giuseppe e Pericle Lavazza designed and managed a sustainability project, aimed to improve coffee quality and quality consistency. The project enabled training sessions and infrastructure investments promoting opportunities for farmer organizations. In addition, in collaboration with the Rainforest Alliance one hundred farming families in Meta were able to restore their coffee plantations; creating more sustainable working conditions, improving coffee quality and plantation productivity through sustainable cultivation standards.

The project is divided into three main components and two transversal components:

Main components

Rewriting coffee growing in the Piedemonte Llanero

This component includes a series of program practices developed by specialized national and international actors who guided each of the approaches proposed in the project. This strategy includes

The integration of the Integrated Pest Management Program (MIP), directed by Cenicafé taking into account the requirements of the Rainforest Alliance's

Coffee rejuvenating and Growing new coffee plantations - Using Volcafe Way's methodology

Post-harvest practices and coffee quality consistency - Promoted under Rainforest Alliance standards

And **better harvesting practices**, integrating coffee pulping, drying, packaging and storage practices - led by the Carcafe Foundation

Producer Organization strengthening

Under the support of Coffee Defenders, the project provided infrastructure for coffee processing and worked on capacity building for POs in governance and teamwork. Including training for POs in technical, agronomic and social issues; of which the last one was directed towards conflict resolution, entrepreneurship, assertive communication and internal governance of POs.

Diversification through agroforestry

This component of the strategy aims to increase the income of coffee-growing families during the off-season of the coffee harvest. Promoting and operating technical assistance for the implementation of agroforestry arrangements for crop diversification and silvopastoral systems with cattle.

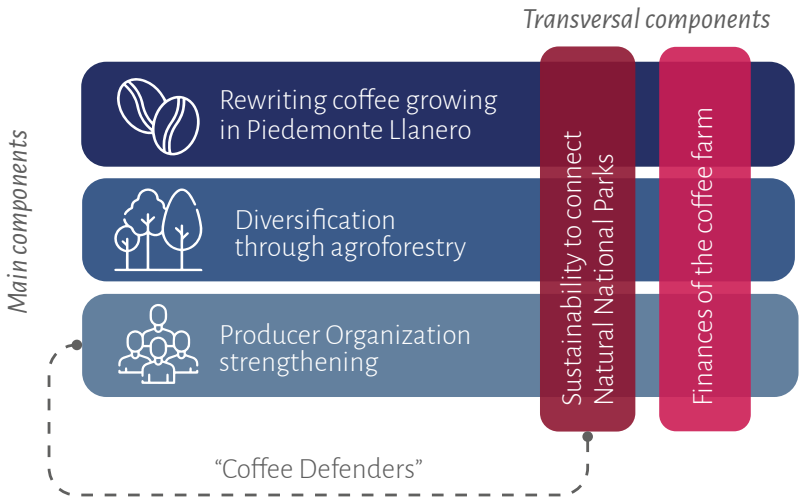


Fig 36. Tierra Colombia- Meta project components

Transversal components

Sustainability actions to connect the important national parks

This component mediates the interest of promoting sustainable productivity and the conservation of national parks, around which coffee producers develop their economic activity. Leading them to develop more environmentally friendly production systems.

Manage the finances of the coffee farm

Within the framework of the alliance with the Dutch Solidarity Foundation, finance courses were developed for coffee growers, making use of various tools and dynamics framed in the sociocultural context of these rural areas. They focus on teaching the management of financial resources in coffee farms, beyond showing how to calculate coffee costs, they seek to convey the importance of finances so that they can see their own farm as a business.

6.1.1 Corporate Social Responsibility Sustainability Projects

According to the United Nations Industrial Development Organization, corporate social responsibility (CSR), "is a management concept whereby companies integrate social and environmental concerns in their business operations and interactions with their stakeholders". By practicing CSR, companies become aware of the type of impact they have on several aspects of society, including the economic, social, and environmental.

This concept can also take several forms depending on the industry and the company. In this sense, it is possible to distinguish between a concept relating to strategic business management, sponsorships, philanthropy, or volunteer efforts through which businesses can benefit the society while improving their reputation and fortifying their brand.

Implementing this concept correclty can offer competitive advantages such as better access to new markets, higher sales and profits, higher productivity and quality, branding improvement and loyalty. Integrating CSR implies that in the regular development of its business, a company can reduce its negative impacts and implement strategies in its daily operations that contribute positively to society and the environment well being.

The ¡Tierra!, Meta sustainability project is a clear example of how Lavazza develops Corporate Social Responsibility Sustainability Projects. ¡Tierra! was created with the purpose of improving living conditions and social development, by assisting the economic growth of coffee-producing communities while keeping environmental stewardship at the forefront.

This project takes into account not only aspects of social responsibility, such as

supporting small communities of cyclists and sustainable practices, but it also takes into account the principles of premium product quality that the brand offers within its product portfolio.
The program resulted in the creation of a high-quality coffee that bears the name ¡Tierra!, which is made from organic Arábica grown in completely sustainable conditions. Offering excellent quality beverages to their customers while also being certified by one of their most key development partners, the Rainforest Alliance.

Lavazza ¡Tierra! currently offers a variety of international products from Africa, Central America, and South America to its customers, with each line containing grains from territories and communities that participate in CSR projects carried out and promoted by the Lavazza Foundation. Having as main areas of the CSR the good practices, that go from the planting of its grains, to the cup. This has allowed to increase the production and its quality, while improving the living conditions of the farmers, promoting the economic development of these communities and supporting sustainable social development.

6.1.2 Project analysis

As a result of the project, Tierra Colombia- Meta project, the sustainable development program, was able to improve the socioeconomic conditions of over a hundred rural families in the region, as well as contribute to the reactivation of this coffee-growing land. More than one million plants have been harvested, and training programs devoted to good agricultural practices and techniques were developed to combat the effects of climate change.

Analyzing the project it can be identified that its implementation had as central inputs mechanisms aimed at capacity building, technical support to producers and the implementation of agricultural equipment.
Having as a central axis the training component called Rewriting coffee growing in the Piedemonte Llanero, since the majority of the problems that arose in the farms were related to bad practices, both in crop harvesting and post-harvesting manipulation, keeping in mind that many farmers were only recently resuming this agricultural activity, which was halted due to the presence of armed conflict in the region, forcing farmers to abandon their farms and coffee cultivation.

With the inputs provided, it was possible for farmers to implement more sustainable farming practices, adopt quality control tools, and to improve post-harvest processing through the collaboration of the OP using the new equipment and infrastructure.

The results of these small communities are significant, as they were able to double the productivity per hectare and incorporate the production of high quality coffee certified by the Rainforest Alliance; in addition, they were able to plant approximately 13,000 fruit trees on small farms, providing farmers with a new source of income in addition to coffee cultivation while also allowing them to sustain the food security of their families.

From this perspective of change, the Meta coffee sector has a great potential to be recognized both nationally and internationally for producing high-quality products under standards that guarantee the socio-environmental sustainability of agricultural production. Allowing the consumer to enjoy not only a good cup of coffee with sustainable standards, but also to understand the context behind it; promoting the traceability of its processes and sharing the resilience stories of the region's coffee families.

Fig 37. Hermanos, Colombian coffee roasters, 2021

Opportunities from a systemic design perspective

Although the objective of the project was to develop and improve sustainable farming practices in coffee communities of Meta, it is important to recognize that all these changes have an impact on the entire production chain, from seed cultivation to reaching the consumer. Therefore, it is important to understand the entire system in which the coffee sector and the community of Meta are framed.

Systemic design then allows us to visualize the full context of the situation we are facing. A tool to analyze this complexity, recognizing that the reality of the coffee sector in Meta is directly related to and dependent on market reality.

Understanding their relationships and interactions with other actors is critical for the development of a proposal, as is identifying the information, and resources flows that allow the coffee system of Meta to function.

Implementing good farming practices makes the activity more profitable, improving the living conditions of the farmers and stimulating economic development in the community and region, thereby developing a completely local know-how.

Giving growers an opportunity to consolidate and recognize their role within the coffee industry by providing a product that meets the expectations of a sustainable market that is increasingly interested in knowing what is behind the product.

Designing a proposal that brings positive effects to the coffee production chain is understood as looking at both sides, the consumer side and the farmer side. The dependence that these two spheres have in the context analyzed. For this it is important to understand in a holistic way the territory and the coffee productive sector in order to understand the interactions of the sector with the chain of actors. mèas que cafe, aims to develop a strategic program that is based on the interactions of a network of national and international actors in which the recognition of coffee in the Meta region

and those who produce it is sought. A model is proposed that impacts the different realities that are integrated in this coffee system, on the one hand that of the farmers and on the other hand the reality of the consumer market, since one has a direct impact on the other. Taking these interactions between the actors as a starting point, three components are proposed for the strategy: Capability building, Consumer engagement experience and coffee producers' founding network.

“ (...) The countryside in this country is much more than a seaside resort and bears little resemblance to what movies show (...)”

Carlos Rodríguez, a farmer leader from La Macarena, Meta. 2020

6.2 ANALYSIS OF THE REGION

The department of Meta is characterized by its geography, culture and other factors that make it unique. It is this value that we want to recognize and show, that is why in this chapter we make a deep analysis of the region to understand its reality and that of its people, because history shows us how this community is an example of resilience.

6.2.1 Meta context data

Climate

It is located in the Intertropical Confluence Zone or ITCZ. Rainfall can vary from 2000 mm, in the higher parts of the mountain range, to 6000 mm, in municipalities such as El Castillo and Lejanías. And its temperature varies from 6°C in the paramo, up to 24°C in the plains, while in the foothills it ranges between 18 and 24°C.

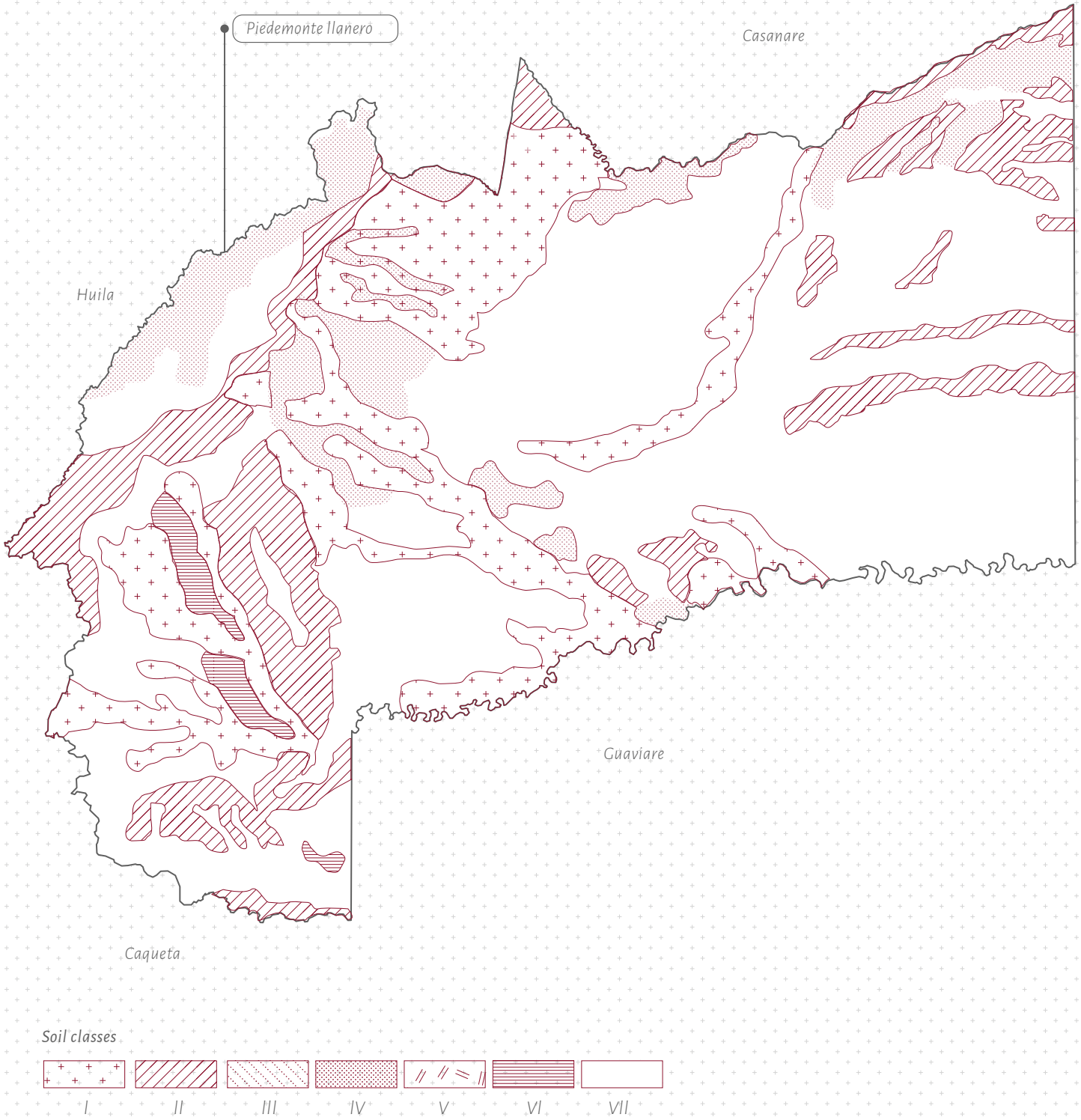
Geography

The department of Meta is one of the largest in the country, with an area of 85,635 km 2, equivalent to 7.5% of the national territory. It extends from the plains foothills to the Eastern Plains. Although the department is part of the eastern plains, it has mountainous areas, including the Páramo de Sumapaz and Serranía de la Macarena natural parks. The agroecological conditions make it a creditor of a large window of opportunity for agricultural exploitation, especially crops such as coffee and cocoa. The region is also rich in water due to the numerous tributaries of the Orinoco River that cross the department.

In the Meta department, seven soil classifications with regard to agricultural regions may be recognized, which vary from the most suitable, with high yields without the need for inputs, to the least suitable, with a low amount of organic matter.

Class I. Are soils with high fertility, good irrigation conditions and suitable for a wide variety of crops.
Class II. Have lower fertility, so it is necessary to support with fertilizers, which requires a high concentration of labor.
Class III. Located in the hills, with some water dividers and topographic conditions that allow the use of gravity irrigation systems.
Class IV. These are located in the foothills with little sowing. They are soils of lower fertility but respond to fertilizer doses that allow the cultivation of some food products.
Class V. Correspond to soils of low fertility and with very low response to fertilizer
Class VI. Located in sloping areas where iron contents are quite high.
Class VII. Located in the center and north of the department where evaporation is high, resulting in dry areas quite susceptible to erosion.

Fig 38. Soil classes in the department of Meta



Note. Adapted from Mapa Geológico Del Departamento Del Meta (p. 16), by A. J. Rodríguez Parra, 2001, Ministerio de Minas y Energía. (fig. 36)

ROADS AND
TRANSPORTATION

12 private companies *and the state company Satena*

2,352 km
Roads with
kind of technical design

1.000 km
Reelables

562,5 km
National roads

187.3 km
paved roads

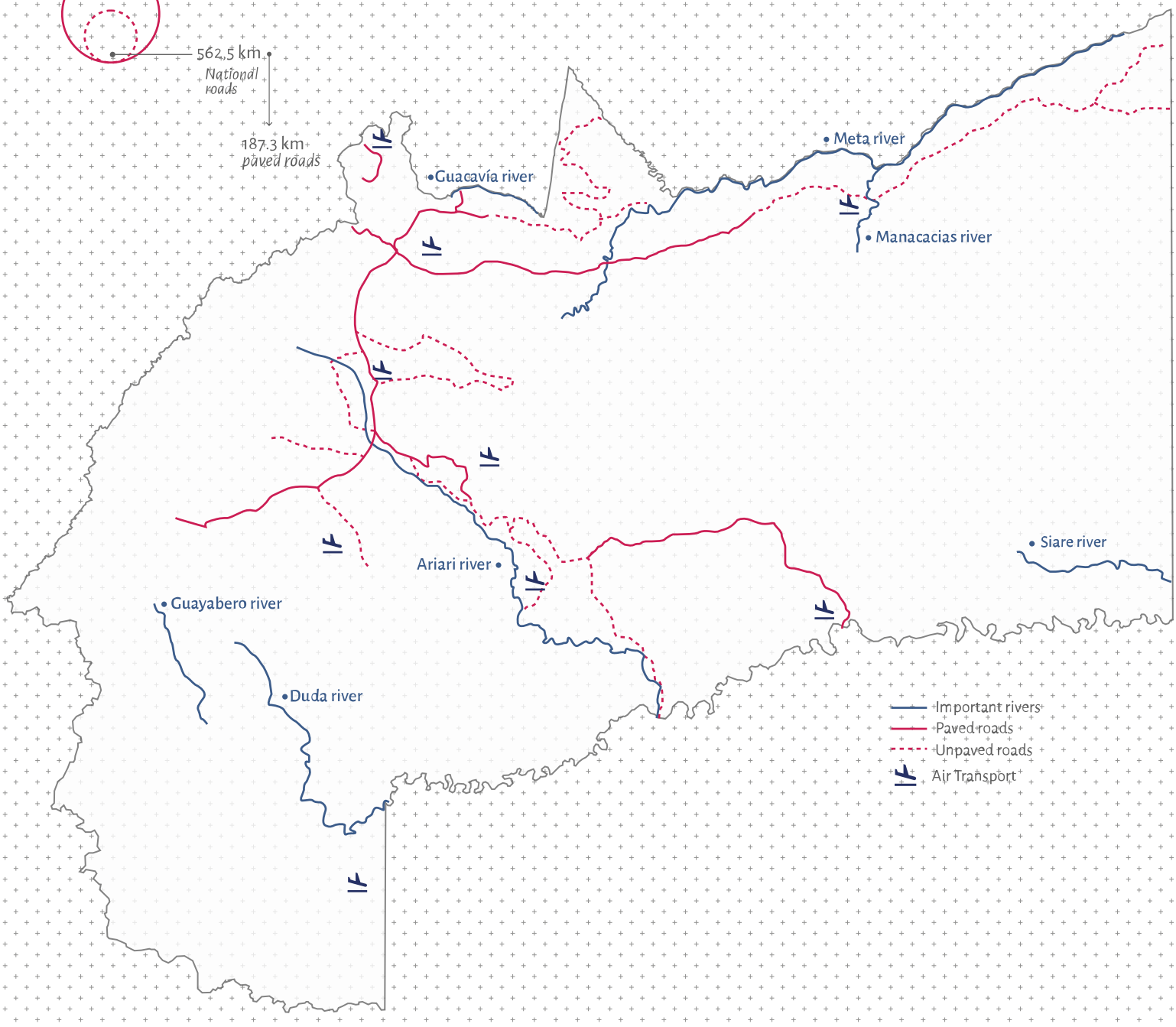


Fig 39. Road and transport in Meta department

Demography and economy

Due to the data availability, it was decided to interpret data from 2018 to the present for the department's demographic and economic study. Nevertheless the information seeks to be evaluated in the same line to understand the insights and the relationship between them.

As a starting point it is important to know that the population in Meta for 2018 was 919,129 people according to the census conducted by DANE. A problem not only in the department but also in the country is that the poverty rates in the population are considerably high; to analyze and understand more deeply this social and economic inequality, DANE created a tool to analyze poverty from a multidimensional vision. In the 2019 technical bulletin of multidimensional poverty (PM) in the eastern region the department of Meta represents one of the highest percentages of poverty, taking into account that a large part of the coffee population lives in rural areas and population centers, it is important to

highlight that the percentage of people living in multidimensional poverty in these areas was 23.1%, the highest in the department.

This percentage of MP represents the integral analysis of several aspects, however we would like to delve into what concerns the maintenance and the state of households since it represents an important value in the income and outgoings of people. The minimum wage in Colombia for 2020 was recorded at 175.52 €, which allows us to identify a critical picture when compared to the average wage in rural areas, since according to a study conducted by the United Nations Development Program in 2021 is below the minimum, with a total of 105.96 € which, considering basic living expenses for a family is remarkably insufficient.

To understand this insufficiency we take as a sample the study of housing and population characterization of the rural area of Bogota D.c published in where households are mostly composed of 4 members. Consequently, the individual in charge of a family in a rural location has to earn enough money to buy a basic basket, which corresponds to food, clothing, transportation, education, health, housing, etc. We use the value of the food basket as a baseline, which for 4 persons is in total 170€ as mentioned in the article of El tiempo “How much a minimum wage worker spends on the basic food basket” . Knowing this, it is clear why the poverty line in Meta is so high: the income does not cover the essential expenses to subsist in the department. This sets a paradox because Meta’s economic operations are highly diverse and have a big effect on the global economy so the income of the department should be equivalent.

170€ Basic food basket (4)

Other expenses: *clothing, transportation, education, health, housing, etc.*

The economic income in relation to expenses is not enough to keep households in Meta

84,29€

Poverty line per capita in Meta

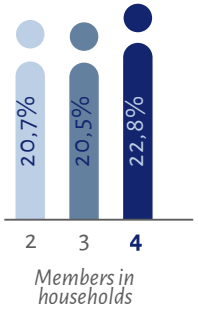
People who receive income per capita below are considered poor

919.129
Population

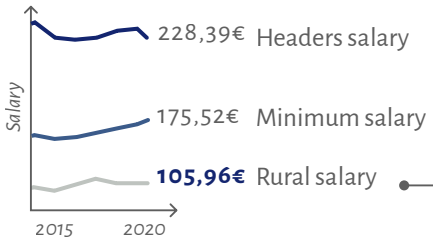
23,1%
Poverty situation in populated centers and dispersed rural areas

$29 millions
PIB *Per capita*

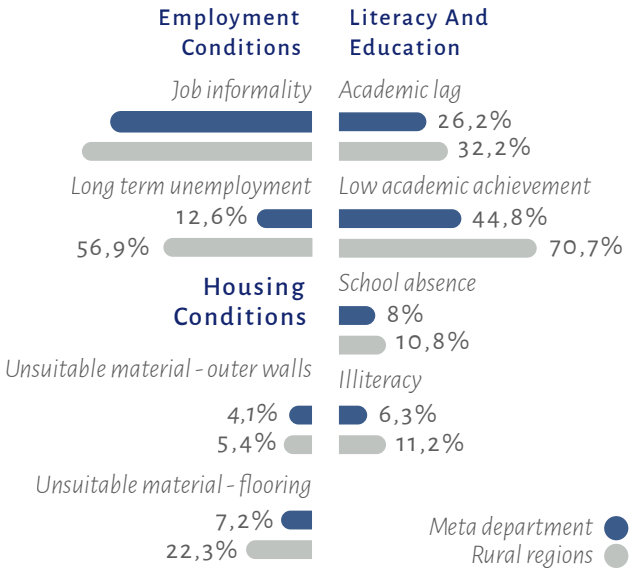
HOUSEHOLDS SIZE



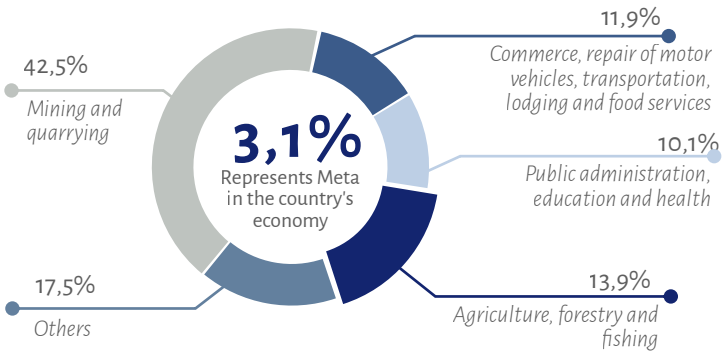
AVERAGE EMPLOYMENT INCOME (€)



PERCENTAGE OF HOUSEHOLDS FACING DEPRIVATION



GDP MAIN ECONOMIC ACTIVITIES IN META (%)



PRODUCTION META (TON)

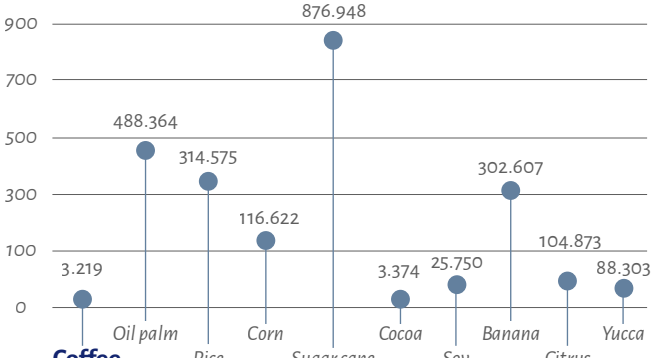
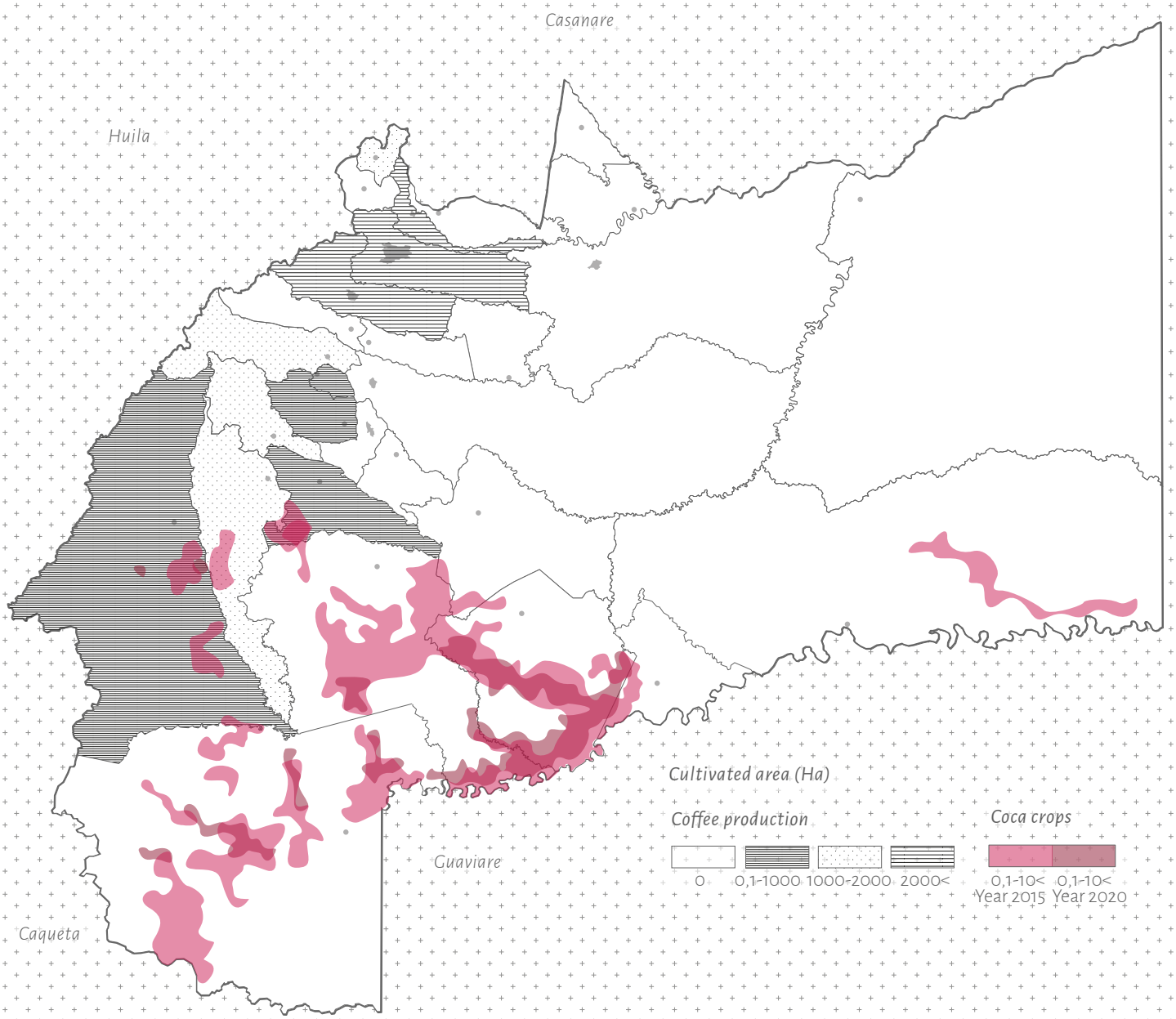


Fig 40. Economy of Meta

Meta not only symbolizes a cultural revolution but also an economic transition in terms of coca farming. Coffee is part of the productive economy of the region, but in a very low percentage because there are few municipalities that have a representative amount of cultivated areas; nevertheless these are the areas that have been representatives of the transition from cocaine cultivation to coffee cultivation because they have supported the process of eradicating the drug through the proposal of an agricultural alternative that, in 5 years, has generated effective results.

Fig 41. Coca cultivation density in the Meta - Guaviare region, 2015



Note. Adapted from "Monitoreo de territorios afectados por cultivos ilícitos, 2015" (p. 32), by United Nations Office on Drugs and Crime, 2016.

Agribusiness and Small Farmer production in the department of Meta

The peasant production and agribusiness in the department of Meta can be classified into different types of crops such as :

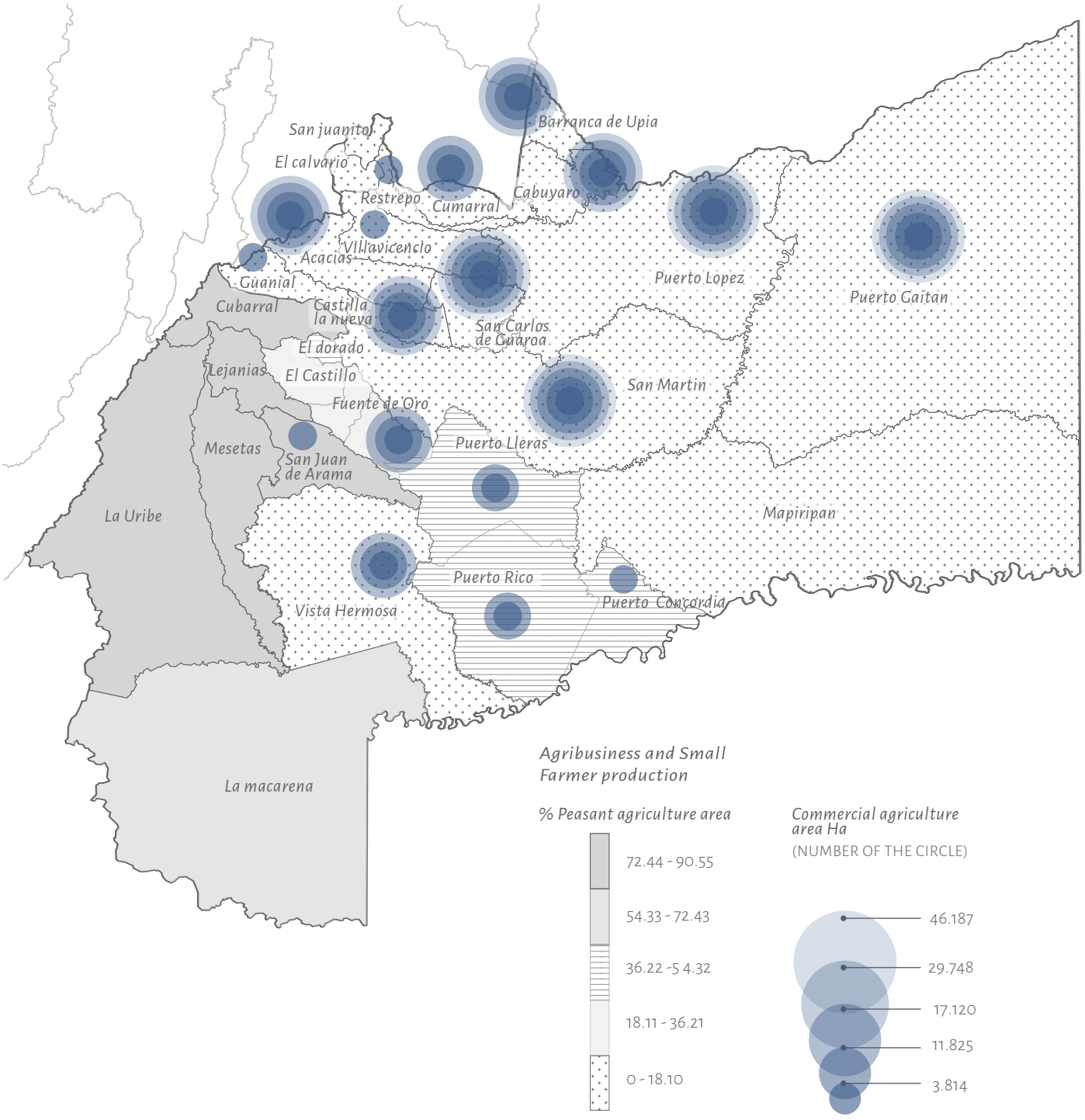
Peasant (temporary)
Some of the products are papaya, coffee, cassava, banana, traditional corn, arazá, banana, passion fruit, sugar cane, stevia, among others.

Commercial agriculture, referring to extensive monocultures as:
Oil palm, soybean, rubber, irrigated rice, dry and mechanized rice, technified corn and sugarcane.

Some of these lands have been handed over to farmers by the government as a contribution to the restitution of land to victims of the armed conflict or as part of an agrarian reform policy.

As can be seen in *Figure 42*. During 2013 only five municipalities had peasant production above 70%, corresponding to the municipalities of Cubarral, La Uribe, Mesetas and Lejanías. It should be noted that the municipalities that maintained this type of production are part of the piedmont zone. And during the same year the decrease of peasant crops in the south of the department was associated with governmental discouragement with assistance and credit programs to the peasantry including coca cultivation as another factor that affected.

Fig 42. Variation in commercial vs. peasant agriculture, 2013.



Note. Adapted from "Dinámica territorial del extractivismo agrícola y petrolero a comienzos del siglo XXI en el departamento del Meta, Colombia" (p. 48), by Devia Acosta, C. Y., Piñeros Lizarazo, R. 2021, Perspectiva Geográfica Magazine. 26 (1).

Culture

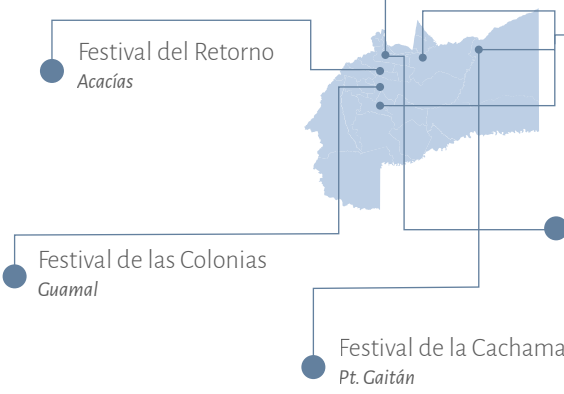
The department is characterized by a strong "llanera" culture, where livestock and horses play a fundamental role, being a leading economic and leisure activity. The typical music is the joropo, accompanied by harp and maracas. Its gastronomy, being an extensive territory, ranges from grilled meat in the sun, fried fish and chicken soups and Cachicamo (a sort of plains armadillo), and araca fruit. Several indigenous communities, such as the Sikuani, the Paéz, the Achaguas, the Embera Katío, the Embera Chamí, and the Witoto, among others, have a strong influence from a cultural standpoint in certain departmental municipalities and territories.

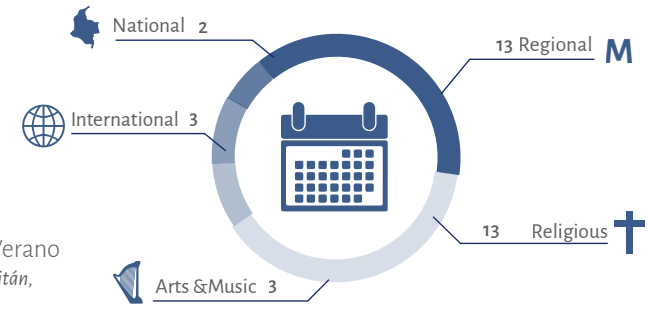
Fig. 43 Culture in Meta region

HOLIDAYS AND FESTIVITIES

Departmental festivities

- Festival Llanero de Villavicencio — *Villavicencio*
- Festival del Retorno — *Acacías*
- Festival de Verano — *Granada, Pt. Gaitán, Pt. López*
- Día de la Llaneridad — *Villavicencio*
- Festival de las Colonias — *Guamal*
- Festival de la Cachama — *Pt. Gaitán*





ARTS

Music

Joropo

CORCUMVI

Corporación Cultural Municipal de Villavicencio

The department's principal cultural hub

RACIAL COMPOSITION

White and mestizo *Afrocolombian* *Amerindians/Indigenous*

INDIGENOUS COMMUNITIES

13.760
In 30 territories

- Sikuani
- Paéz
- Achaguas
- Piapoco
- Guayaberos (Jiw)
- Salivas
- Guananos

Displaced by illegal groups and violence

- Embera Katío
- Embera Chamí
- Witoto
- Inga

TYPICAL GASTRONOMY

Mamona
outdoor roasted beef meat. Derived from Spanish tradition.

Sancocho de Gumarra (chicken)
Chicken based stew, completed with potato, corn and plantain.

Cachama
Fish from the Orinoco river, cooked in several ways such as roasted and fried.

Boiled Cachicamo
Small armadillo animal, killed and boiled. Cut to bite size or put in soup.

Tungos llaneros
sweet rice dough with cheese wrapped in different leaves.

Berraquillo
Exotic juice made with several ingredients, including crab, brandy, etc.

Arazá juice
Frozen arazá pulp, mixed in water or milk. Amazon region fruit.

Rice bread
Rice flour and curd mixed and baked in donut shaped portions.

6.2.2 The coffee sector in the region

Today the Meta region has around 3,500 hectares of coffee cultivated by at least 3,800 coffee growing families. From the Piedemonte of the Orinoquia, the coffee growers of this region have gradually converted coffee into an economic alternative accepted by farmers in a territory that has been significantly affected by the armed conflict and drug trafficking. Coffee represents for the coffee growers of Meta and their families a better economic alternative for the post-conflict period, allowing the strengthening of the social fabric, with the purpose of achieving a better future for their families and the well being of the entire region.

Twelve of the 29 municipalities that compose up the department grow coffee and 3 of them frame the development scenario of the Tierra Metaproject: Mesetas, Lejanías and San Juan de Arama. The first two municipalities head the list of harvested areas being the only ones with a quantity superior to 2000 Ha as evidenced in the maps of the previous section, while San Juan de Arama is in 4th place with approximately 1500 Ha according to an analysis of coffee figures developed by the group Cafe del meta in 2022. Taking the dimension of the harvested area into consideration it is important to highlight that due to this, the 3 municipalities together represent 68.2% of the coffee potential of the department which for some years now has been growing thanks to the coffee plantation renewal program, the leader of the agricultural portfolio states that Meta's production climbed 128.2% between 2010 and 2017, reaching the highest point of its coffee potential between 2010 and 2019, as shown in a report from the Ministry of Agriculture and Rural Development in 2018. This enables us to make an optimistic forecast of how coffee will evolve in the region

over the next few years, especially given that projects like Metaproject and the repair of coffee farms are not only warmly appreciated but are also being carried out in a good and effective manner.

The amount of coffee cultivation in Meta continues to increase, however, time has passed since the plantations began and currently problems have been identified that surround more the technical areas. Given that the majority of farmers started growing coffee for the first time without having done so previously, there are a number of techniques whose development is not ideal due to the lack of practical and theoretical knowledge. This has a substantial influence on the production rate of the crop in addition to altering the quality of the coffee. After a meeting with the director of the coordinating offices and other territories of the FNC, Huver Elias Posada Suarez, it was concluded that one of the recurring problems was that the investment of the coffee grower in his crop was not totally remunerated since the percentage of harvested area was less than the area planted, which means that due to the lack of access to good practices there are steps in the cultivation process that are limiting the correct development of the coffee seed. It indicates that some cultivation processes are restricting the proper growth of the coffee seed due to the lack of access to good practices.

Nevertheless, the region's coffee production is still increasing, as seen by the **35 brands of roasted coffee beans and roasted-ground coffee** that have been created according to Cafe del Meta group 2022, of which are **highlighted 21** of them on the e-commerce portal 21; It is crucial to keep in mind that some of the region's coffee development may improve access to seals and certifications., because of the 21 brands mentioned before less than 5 have any certification such as Colombian Coffee, geographical denomination or green seal. As previously mentioned, there is a lack of support and follow up on technical aspects that could improve the crop and allow it to enter a competitive market.

Fig. 44 Some coffee brands of Meta through e-commerce.

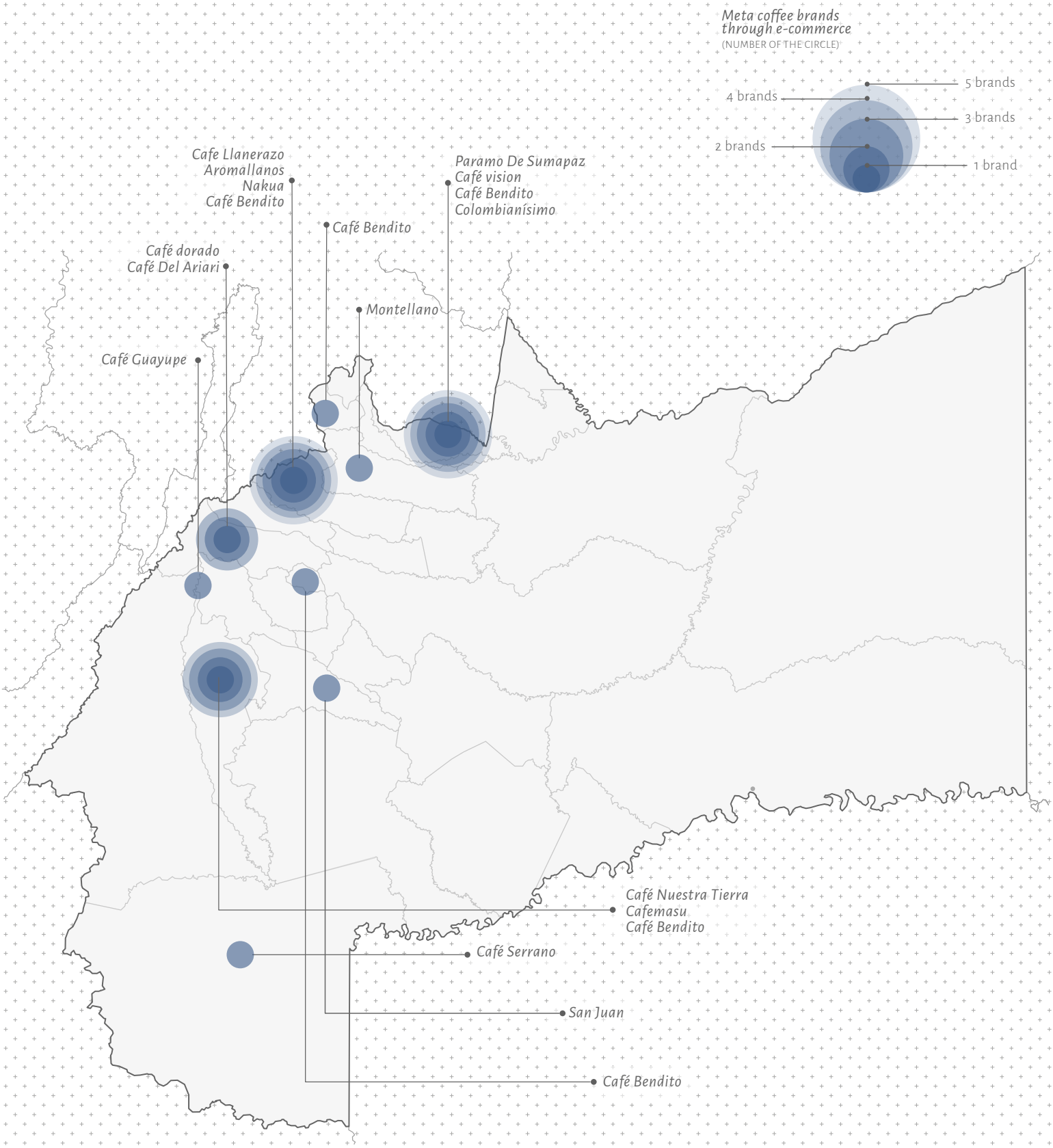


Fig. 45 GigaMap Meta's department

META REGION COFFEE TIEMLINE

- 1730's — The Jesuit community introduces it
- 1870 — Is established as a local product
- 2016 — FARC peace treaty - new development
- 2016 — Tierra Colombia is launched

Giga Map Tierra Meta Project

Who lives in Meta?

49.5% Women

50.5% Man

Population 919.129

- Lejanías 10.576
- Mesetas 9.751
- San Juan de Arama 8.242

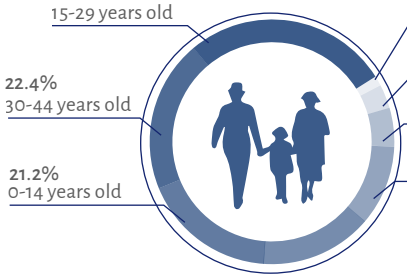
3%

28.569 Population

Tierra meta Project

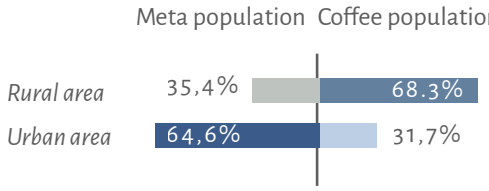
100 Coffee families

AGE DISTRIBUTION

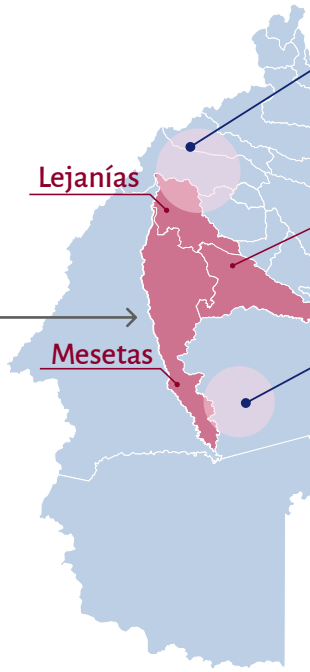


33% aging rate

RESIDENCE



1,629 coffee growers



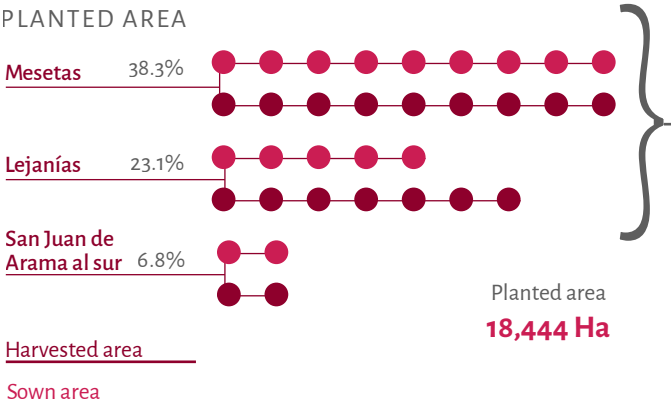
12 Coffee municipalities in Meta

3 Municipalities Tierra project

Lejanias | Mesetas | San juan de arama

68,2% Coffee potential of the department

PLANTED AREA



Planted area 18,444 Ha

Economy

Meta = Country farm pantry

PRODUCTIVE CHAINS

- Horticultural
- Agro-energy
- Cocoa
- Fish

MAIN SOURCES OF INCOME AND RURAL EMPLOYMENT

STAKEHOLDERS

Fundación CARCAFE

FONDAZIONE GIUSEPPE E PERICLE LAVAZZA ONLUS

Small organizations

- 34 — Organization Asodale Mesetas
- 35 — Organization Asoprogresar Mesetas
- 29 — Organization Asoavicome Mesetas
- 72 — Asocafé Lejanías

"Coffee has become a product accepted by peasants as a substitute for illicit crops and an economic alternative for the post-conflict, organized under Municipal Coffee Growers Associations."

Meta geography

29
Municipalities

Area
85.635 km2

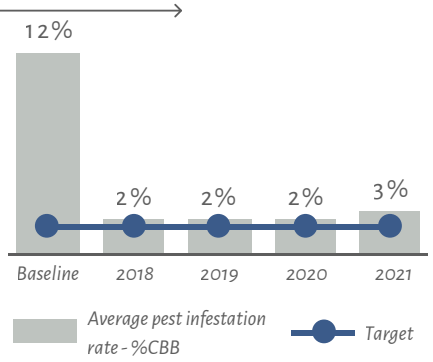
WEATHER CONDITIONS

Temperature
- Piedmont
- Department

18°C
6°C
24 °C

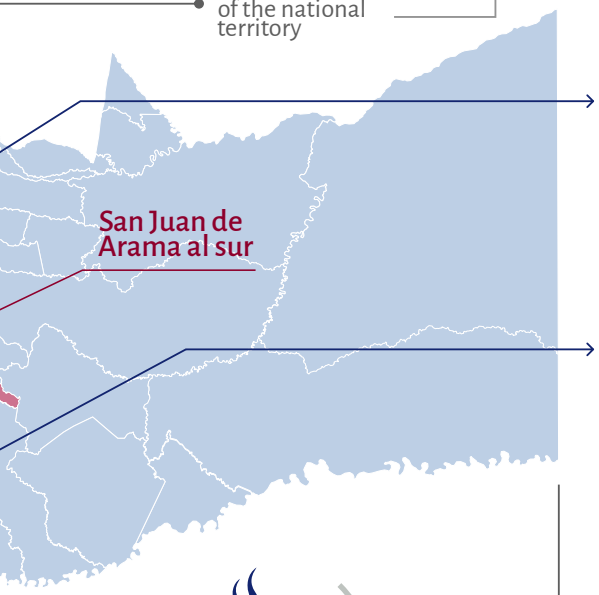
Rainfall
Intertropical Confluence Zone
2000 mm-6000mm

YEARLY CBB PEST INFESTATION RATE



NATIONAL PARKS

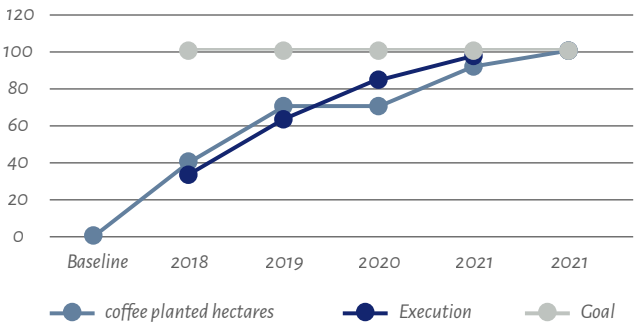
7.5%
of the national territory



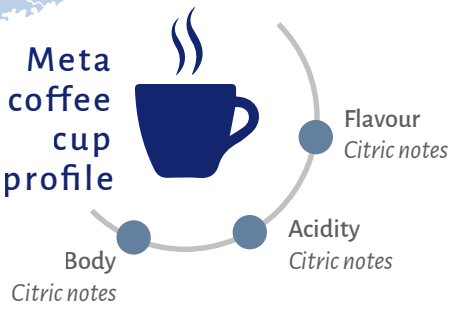
Sierra de la Macarena National Natural Park
629.280 Ha

Sumapaz National Natural Park
137.000 Ha
In Meta department

Change in the area planted with coffee



Meta coffee cup profile



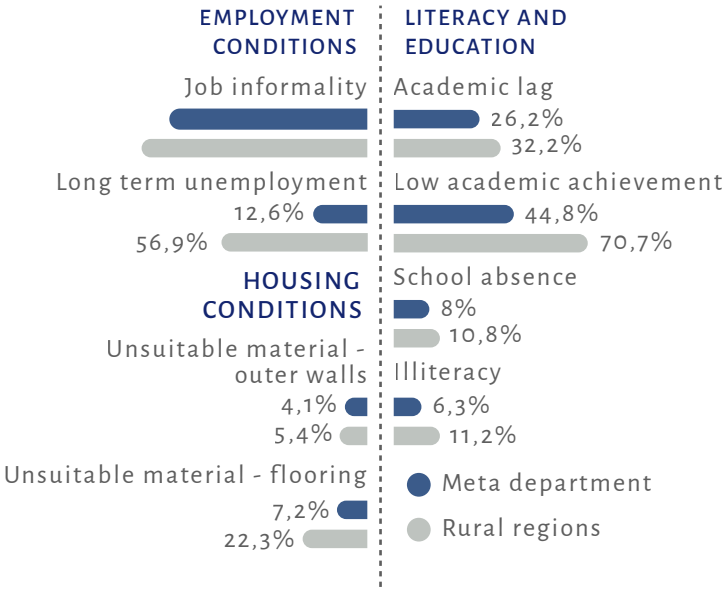
Regional coffee events

Subasta cafetera
Quality evaluation and product auction for national buyers

Expocafé
Regional product promotion and advertisement to the national spectrum

- Rubber-forestry
- Meat-dairy
- Beans

Percentage of households facing deprivation



PEOPLE IN SITUATION OF MULTIDIMENSIONAL POVERTY

Populated centers and dispersed rural areas — **23,1%**

17,8% — headers

$29 millions
PIB
Per capita

225.000
INHABITANTS
Poverty situation

Inequitable distribution of income.

07

Challenges and opportunities

7.1 Challenges identification

7.2 Opportunities identification

7.3 State of art

7.4 Multi criteria analysis

7.1 CHALLENGES IDENTIFICATION

The basis of our role as systemic designers is based on the analysis that is given by the recognition and confrontation of different points of view. To see the system as a whole and not as separate parts, allowing to identify everything that an asset represents within the context to create value in the system, in this case of the coffee sector.

After having analyzed the territory regarding the coffee industry, and the case study in the Meta region, some critical points were identified. In order to understand the areas of intervention, the challenges were divided into 4 macro categories corresponding to: social, productive, economic and environmental. Each category gathers the factors mentioned in chapter 3 in relation to Systemic methodology, where different levels of elements are evaluated, obtaining a solid base in the approach of the existing challenges in the whole system. This allows guiding the project through the pillars that were proposed from the beginning.

Social:

The challenges around the social aspects are found mainly in the way people see their role in the sector, as a common point is the uncertainty regarding the opportunities that the coffee sector has to offer them. The main challenges that were identified at this level are:

Sc 1.Disinterest of the new generations in remaining in the field
Sc 2.Lack of alliances among coffee farmers themselves and other actors to create new opportunities
Sc 3.Recent transition of the region from illicit crops to a sustainable economy with coffee

Productive:

Pc 1. High percentage of rookie coffee growers in the field of coffee
Pc 2. Problems with the way they are processing the coffee, along with the use of poor equipment affecting product quality and productivity.

Enviromental:

Evc 1. Waste of rainwater in production processes
Evc 2. Geographical characteristics, such as the altitude of this coffee-growing area, require very careful management of pests and diseases.
Evc 3. Waste and mismanagement of organic waste generated within the production chain.

Economic:

Ec1. The high percentage of poverty in rural populations
Ec2. Lack of infrastructure of small producers to process coffee
Ec3.Sustainability certifications imply a high cost for micro growers

7.2 OPPORTUNITIES IDENTIFICATION

Based on the different challenges identified in the previous segment, with the categories: social, productive, economic and environmental, some opportunities were identified. It should be noted that despite the division made, it is essential to understand how this analysis is part of a system, in this way it is important to see how an opportunity can impact more than one problem, as shown in the *figure 46*. This event makes it possible to structure an integral strategy whose impact extends to the intervention of more than one challenge.

Social:

01. Find ways to communicate the values and qualities of coffee growing in a youthful environment in the territory.
02. Taking specialty coffee programs to structure new production and market models that allow the integrating of new generations and their capabilities.
03. Encourage the formation of independent producer groups in rural areas.
04. Help farmers to have access to certifications that guarantee a better price for the sale of coffee.
05. Create communication strategies that promote coffee culture in the region and its recognition both in local reality and in the market.

Productive:

06. Structuring teaching programs to integrate new coffee growers into the chain.
07. Integration of different actors with multidisciplinary knowledge that provide a holistic vision of the sector
08. Involve specialized figures to improve the communication of good practices in coffee cultivation between the community and farmers.
09. Creation of an audit model to verify the use of appropriate practices and processes

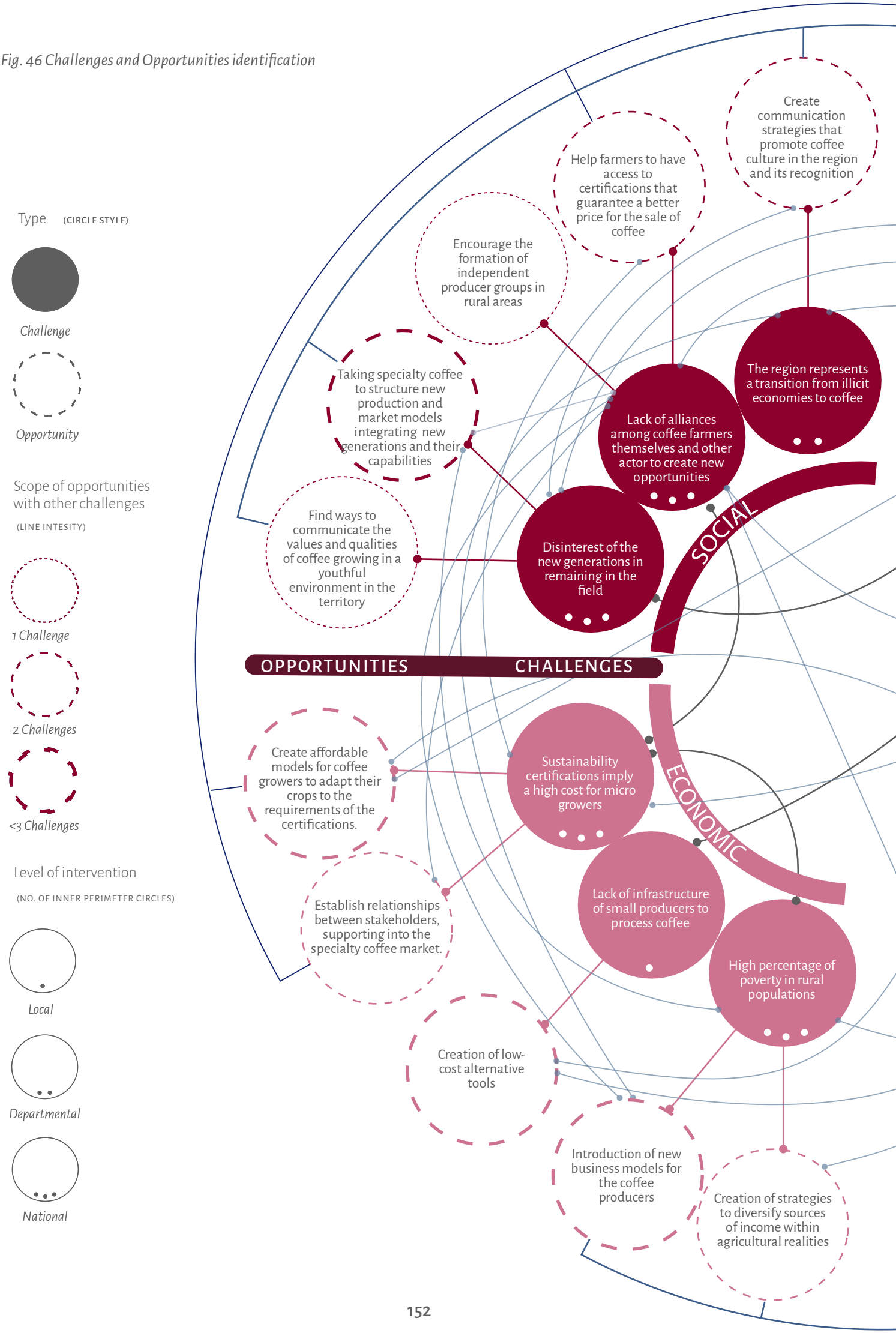
Environmental:

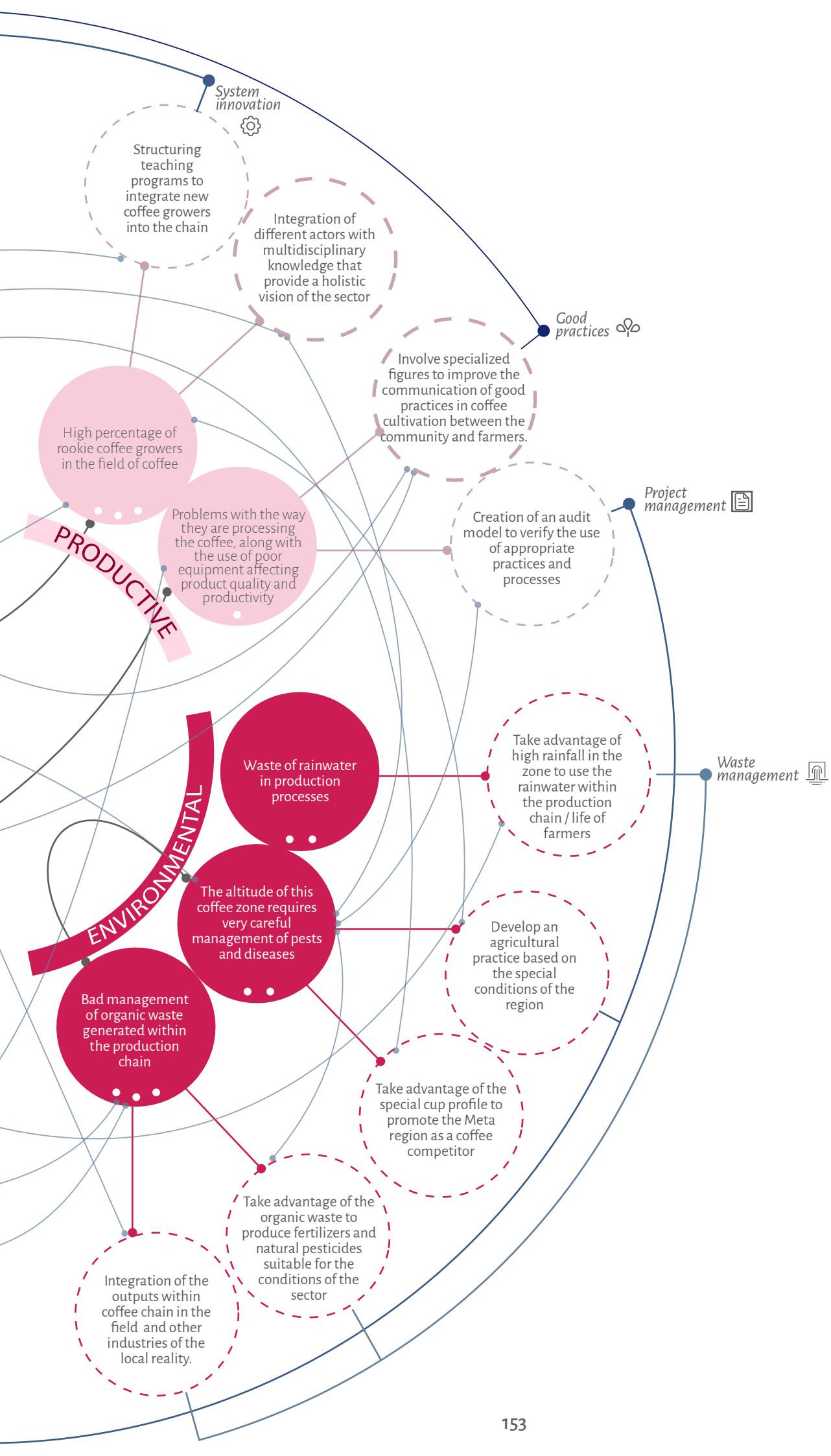
10. Integration of the outputs within the coffee chain in the field and other industries of the local reality.
11. Take advantage of the organic waste to produce fertilizers and natural pesticides suitable for the conditions of the sector
12. Take advantage of the special cup profile given by the geographic characteristics, to promote the Meta region as a coffee competitor.
13. Develop agricultural practices based on the special conditions of the region.
14. Take advantage of high rainfall in the zone to use the rainwater within the production chain / life of farmers.

Economic:

15. Create affordable models for farmers to adapt their crops to certification requirements.
16. Establish new relationships between stakeholders, supporting the integration into the specialty coffee market.
17. Creation of low-cost alternative tools
18. Introduction of new business models for the coffee producers
19. Creation of strategies to diversify sources of income within agricultural realities

Fig. 46 Challenges and Opportunities identification




System innovation
Structuring teaching programs to integrate new coffee growers into the chain
Integration of different actors with multidisciplinary knowledge that provide a holistic vision of the sector
Good practices
Involve specialized figures to improve the communication of good practices in coffee cultivation between the community and farmers.
High percentage of rookie coffee growers in the field of coffee
PRODUCTIVE
Problems with the way they are processing the coffee, along with the use of poor equipment affecting product quality and productivity
Project management
Creation of an audit model to verify the use of appropriate practices and processes
ENVIRONMENTAL
Waste of rainwater in production processes
Take advantage of high rainfall in the zone to use the rainwater within the production chain / life of farmers
Waste management
The altitude of this coffee zone requires very careful management of pests and diseases
Develop an agricultural practice based on the special conditions of the region
Bad management of organic waste generated within the production chain
Take advantage of the special cup profile to promote the Meta region as a coffee competitor
Take advantage of the organic waste to produce fertilizers and natural pesticides suitable for the conditions of the sector
Integration of the outputs within coffee chain in the field and other industries of the local reality.

7.3 STATE OF THE ART

Taking into account the previously mentioned opportunities, a search for some case studies was carried out, both nationally and internationally, taken as a starting point towards an analysis of possible project interventions. These were divided into 6 categories corresponding to teaching programs, communication of good practices, creation of independent groups, outputs integration, specialty coffee network and new business models; framed in the economic, social, productive and environmental spheres.

Fig. 47 Coffee quality school, SENA, 2019

Teaching programs:

National School of Coffee Quality

The development of the quality of the coffee sector through the generation and adoption of knowledge and technological innovation, in order to increase the sustainable production of coffee.
(SENA, 2016)

Rural extension service

Knowledge transfer and technology adoption services that articulates technical and social aspects of the crop, based on the well-being and profitability of coffee-growing families.
(Federación nacional de cafeteros, 2023)

Immersive teaching experiences

Knowledge management and appropriation strategy that uses extended reality scenarios to create experiences for baristas and consumers of specialty coffees with the aim of increasing value-added coffee sales.
(Innovakit, 2022)

Virtual learning for coffee stakeholders

Development of virtual training courses for small and large industry players. Arrange online discussion forums to share knowledge and best practices in the coffee sector, and traders have at their disposal online modules and advisory services.
(Professional Studies-Online Learning Co. Ltd, 2022)

Fig. 48 "Káskara", innovation in the total use of coffee

Note. Adapted from Campus UniSabana Portal de noticias. Copyright 2017

New business models:

Development of Cascara Tea from Coffee Cherry Pulp Coffee

The initiative builds entrepreneurial skills of young and Indigenous people, particularly in non-farming households, so they can start environmentally sustainable businesses. Also training families in communities surrounding the forest to enable them to improve their nutritional status, financial literacy and plant kitchen gardens.
(Moyee Coffee, 2022)

"Káskara", innovation in the total use of coffee

Use of coffee husks (a by-product wasted by coffee growers) as raw material to create coffee husk-based beverages, in infusion presentations. Seeking to generate a positive environmental, social and economic impact.
(Sabana university, 2021)

Coffee husks to build low-cost prefab houses

An alternative construction system, made with vegetable fibers and polymer. Making use of the coffee husks to make lightweight prefabricated buildings for use as living quarters and classrooms.
(WoodPecker, 2021)

Fig. 49 Soap production process, made by Tseltal women Xapontic.

Fig. 50 Area Smith, 2020

Independent producers groups:

Social innovation in mexican coffee production: Filling "Institutional voids"

Establish, together with indigenous peoples and vulnerable sectors, integral processes of social and solidarity economy that contribute to the construction of good living, where work is dignified, changing the history of those who make each process possible, filling institutional gaps, proposing a self-regenerative activity expansion system.
(Yomolatel, 2020)

Specialty coffee network:

Specialty Coffee Collective

A network that works with farmers and cooperatives in 15 countries of origin and 10 key destination countries, supporting trade, logistics and on-demand delivery including specialty companies that also bring select coffees to customers. Achieving a wide range of green coffees to meet market needs through physical presence at the origins of coffee, being an ideal partner for impact-oriented projects that support coffee communities.
(Volcafe)

Outputs integration:

Bio-ethanol production from coffee mucilage

Use of coffee mucilage as raw material to establish a fermentation process for the production of bioethanol.

Obtaining Compost From Coffee

Evaluates the characteristics of the coffee husk, to be transformed, from the composting technique, into a kind of organic fertilizer that helps the formation of colonies of fungi and bacteria that improve agricultural soil conditions.

The use of coffee pulp in animal feeding

Use of the benefit of coffee as the pulp, which when ensiled preserves its nutritional characteristics, making it an alternative for animal feed.

Communication of good practices:

Royal coffee academy

Educational websites open to the public that seek to generate a conscious consumption of Colombian coffee by promoting knowledge of technical, historical and cultural aspects. (Real Academia Del Café)

Fig. 51 Cascara cherry coffee, dry fruit.

Generational change in the coffee sector: the experience of coffee courses for children in Chocamán, Veracruz, Mexico

Design of a coffee growing course for children, based on a perspective of sustainable and integral development, including all the links of the productive chain.

Q graders

Example of entrepreneurship and youth inclusion in the coffee sector; opening opportunities to strengthen their participation in the value chain, through the development of businesses oriented to the specialty market.

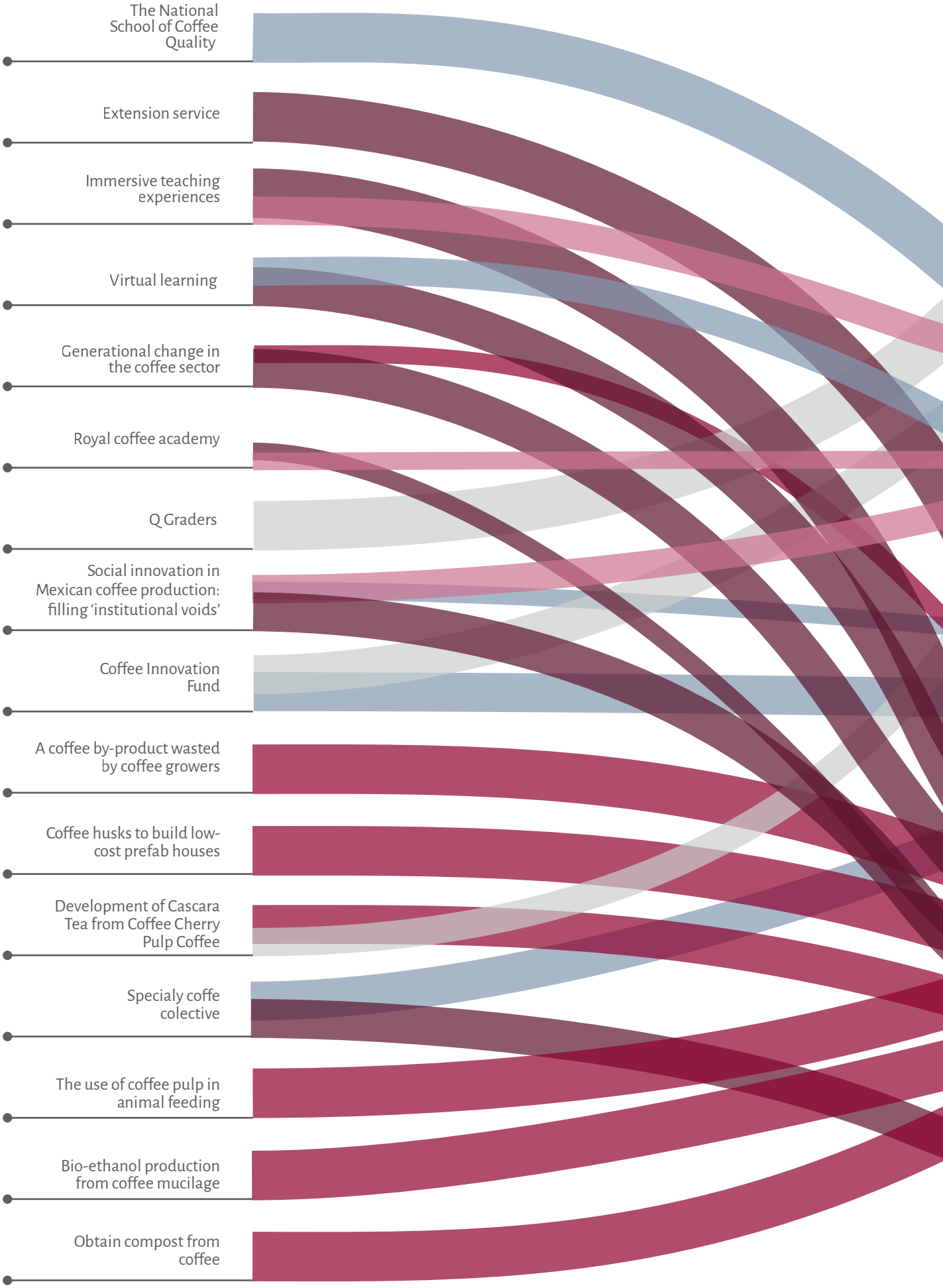

The National School of Coffee Quality
Extension service
Immersive teaching experiences
Virtual learning
Generational change in the coffee sector
Royal coffee academy
Q Graders
Social innovation in Mexican coffee production: filling 'institutional voids'
Coffee Innovation Fund
A coffee by-product wasted by coffee growers
Coffee husks to build low-cost prefab houses
Development of Cascara Tea from Coffee Cherry Pulp Coffee
Specialy coffe colective
The use of coffee pulp in animal feeding
Bio-ethanol production from coffee mucilage
Obtain compost from coffee

Fig. 52 Case study categorization

7.4 MULTI CRITERIA ANALYSIS

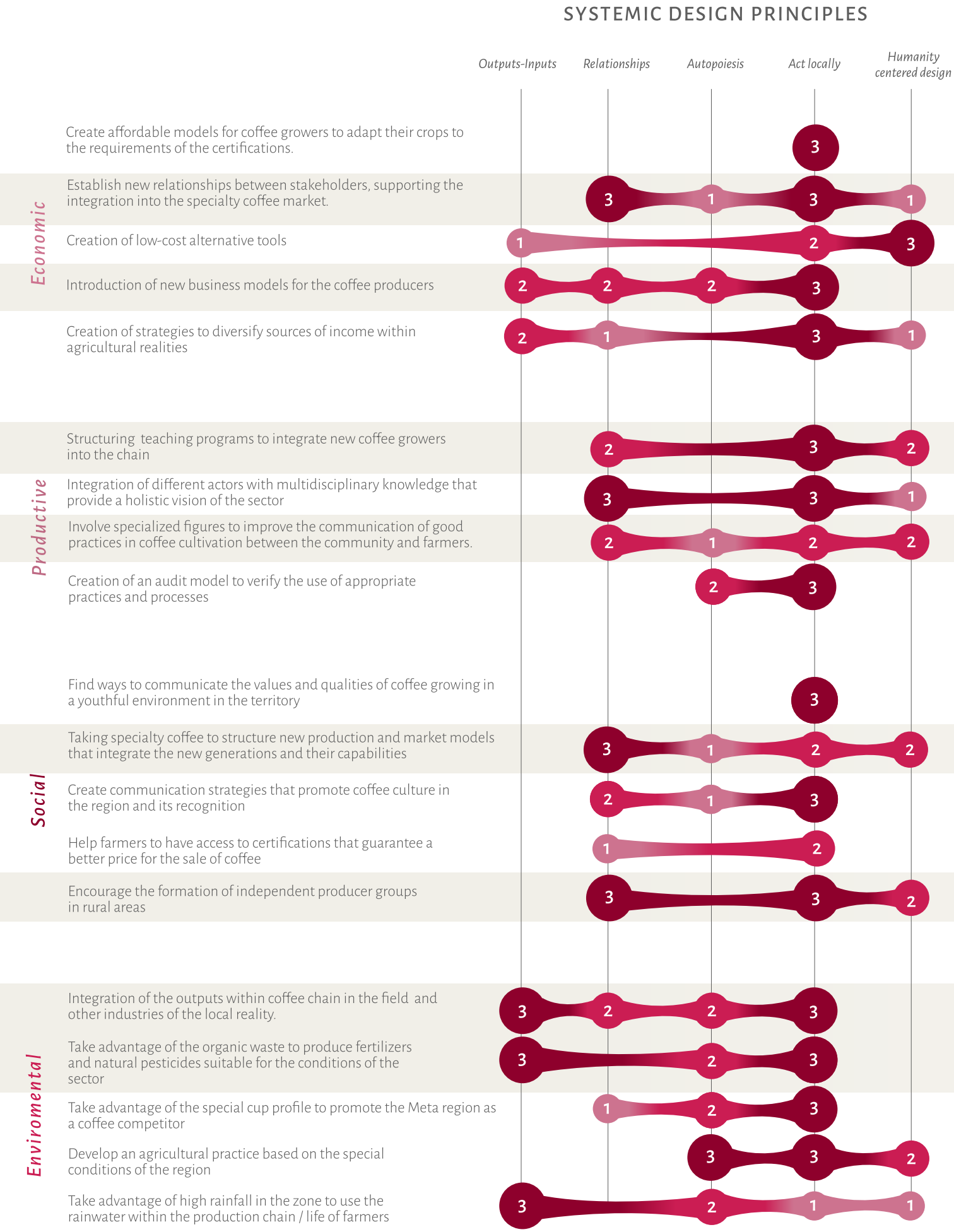
The following analysis allows us to evaluate the opportunities identified in the previous chapter. In this way, it is possible to understand the dimension of the impact they can have if they are developed as part of the strategy.

The multi-criteria tool seeks to support decision making among the alternatives found. The evaluation carried out is divided into two categories, the first one evaluates the opportunities according to the 5 principles of systemic design: Outputs-inputs, Relationships, Autopoiesis, Act locally and Humanity centered design. The second seeks to evaluate criteria according to the reality of the context, defined specifically for each category, following the holistic analysis carried out previously. The way in which the opportunities were evaluated is given on a scale of 1 to 3, with 3 being the value with the greatest impact. If the opportunity has no relevance in the evaluated criterion, its value corresponds to 0.

After the evaluation, two opportunities per category were identified, taking into account the highest scores; however, it is important to clarify that as can be seen in the diagram of challenges and opportunities, the proposals are not exclusive of each other, but on the contrary, they can work in a complementary manner.

This is how the result of the multi-criteria filters the opportunities to a total of 8. The selection allows us to structure a logical thread by which the strategy should be developed, since aspects such as the creation of groups, the development of a totally local know-how, improvements in technical capacities and communication are highlighted, all of which are part of a solid base to be taken into consideration to guarantee the development and success of the other proposals

Fig. 53 Multi Criteria Analysis



CONTEXT CRITERIA

Speciality coffee network

Establish new relationships between stakeholders, supporting the integration into the specialty coffee market.

New business models

Introduction of new business models for the coffee producers

Teaching programs

Structuring teaching programs to integrate new coffee growers into the chain

Communication of good practices

Involve specialized figures to improve the communication of good practices in coffee cultivation between the community and farmers.

New market/production models

Taking specialty coffee to structure new production and market models that integrate the new generations and their capabilities

Independent producer groups

Encourage the formation of independent producer groups in rural areas

Outputs integration

Integration of the outputs within coffee chain in the field and other industries of the local reality.

Organic pesticides and fertilizers

Take advantage of the organic waste to produce fertilizers and natural pesticides suitable for the conditions of the sector

The critical points identified reflect particular problems but have points in common. All opportunities were classified under **three main criticalities:**

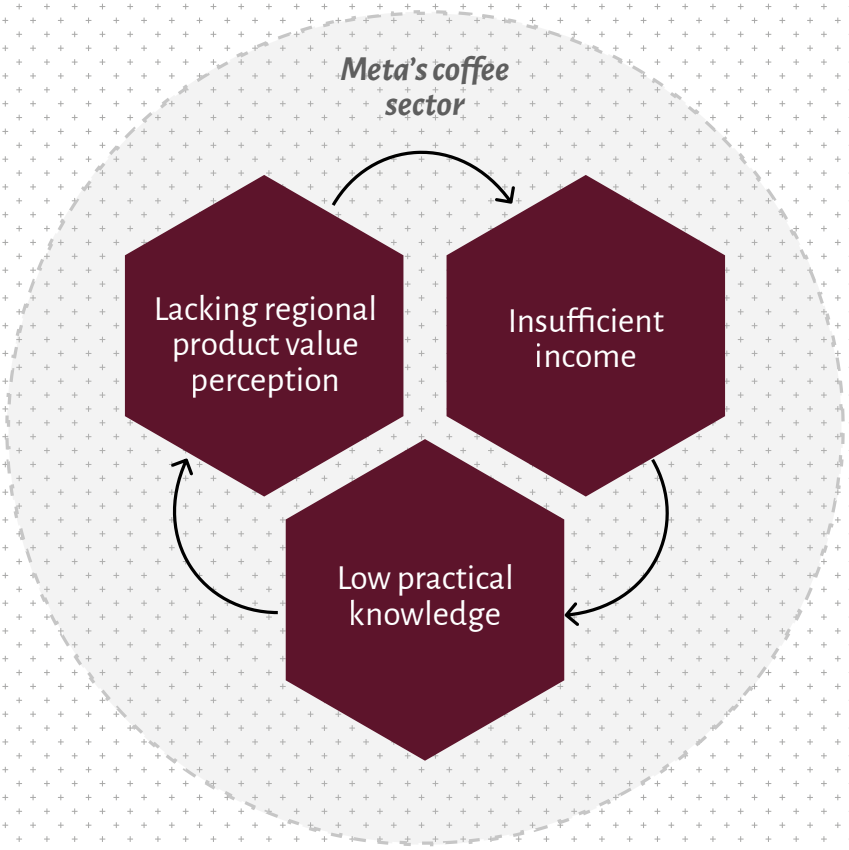


Fig. 54 Identification of the three main challenges

The first evident problem is the number of technical deficiencies that coffee growers have. In spite of the fact that many have been dedicated to coffee growing for years and even decades, to this day they depend on third parties such as the Extension Service of the FNC in order to have clarity on crop renewal rates, soil management, fertilizer utilization, and the condition in which they produce their coffee. This lack of specific and technical knowledge is a determining factor in the scarce sustainability of their production and above all in the quality and consistency of their product, which is already conditioned by a system that is not capable of progressing and innovating on its own. This makes it more difficult to recover the investment made in the crop, generating more expenses and insufficient income.

Despite its coffee potential, the figure of the coffee grower in the department is attributed little to no value, which is exacerbated by the fact that the coffee activity is just beginning to gain strength in some municipalities. This is due to the relevance that the community gives to the cafeteros' role , limiting the promotion of Meta as a coffee growing region.

Factors that have an impact on the competitiveness of Meta's coffee both, at a national level as well as in the eyes of potential markets abroad, since it is not a product that stands out commercially, coffee growers are not able to move their product outside of the purchase guarantee of the FNC and the coffee culture of the department is not developed or promoted.

08

Systemic project: Framework proposal

8.1 Project premise

8.2 Shaping future systems

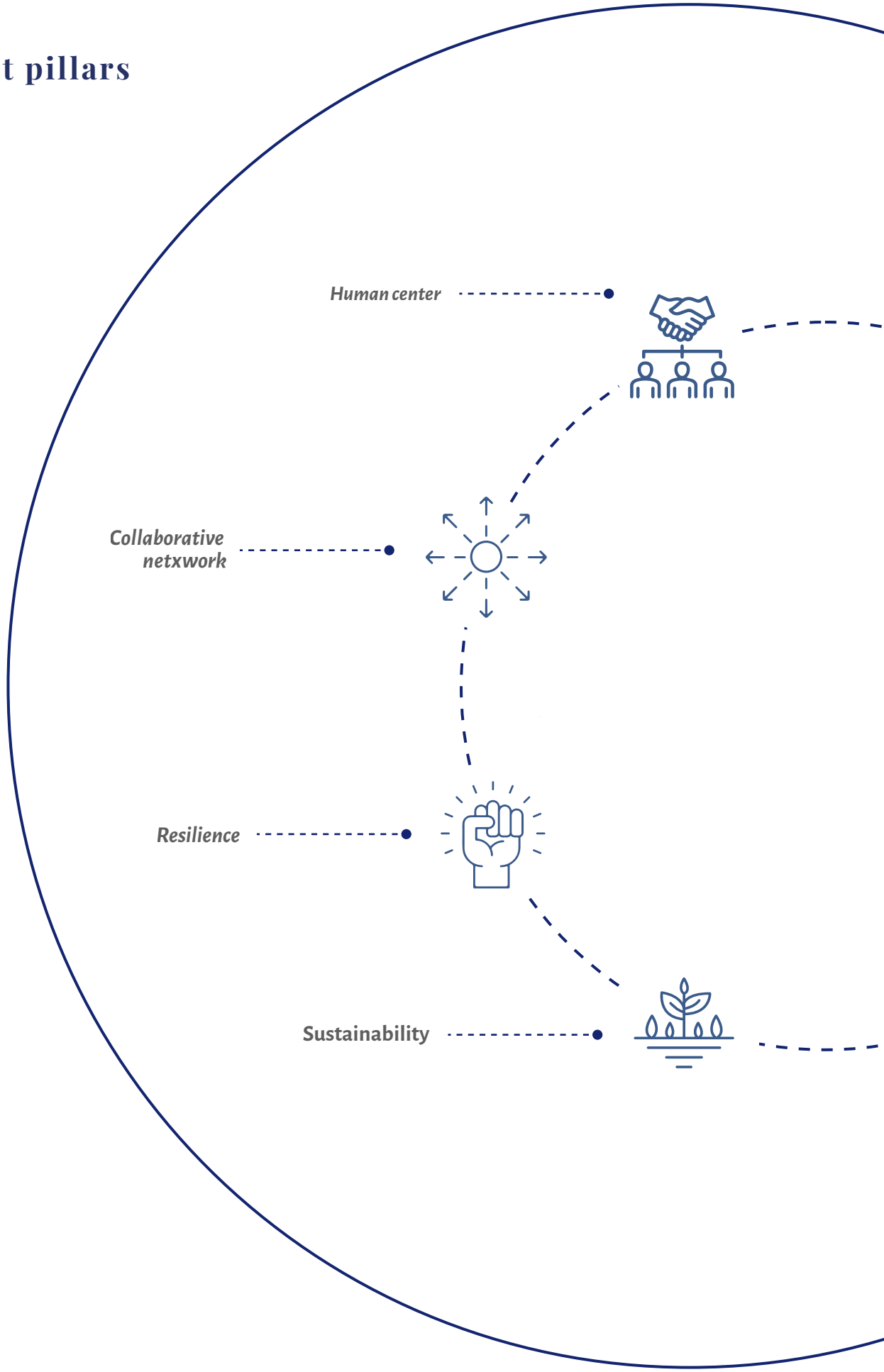
8.3 Mapping Project Stakeholders

8.4 Innovation areas

8.1 PROJECT PREMISE

The coffee potential of the region to be recognized both nationally and internationally for its high-quality product are yet to be fully exploited. By strengthening ¡Tierra! Colombia - Meta project, involving other actors besides coffee growers and promoting sustainable collaboration between them, the department is brought to a high status in terms of recognition and desirability on behalf of current and new markets*, contributing to the competitiveness and well-being of coffee-growing families.

Project pillars



Objectives of the strategy

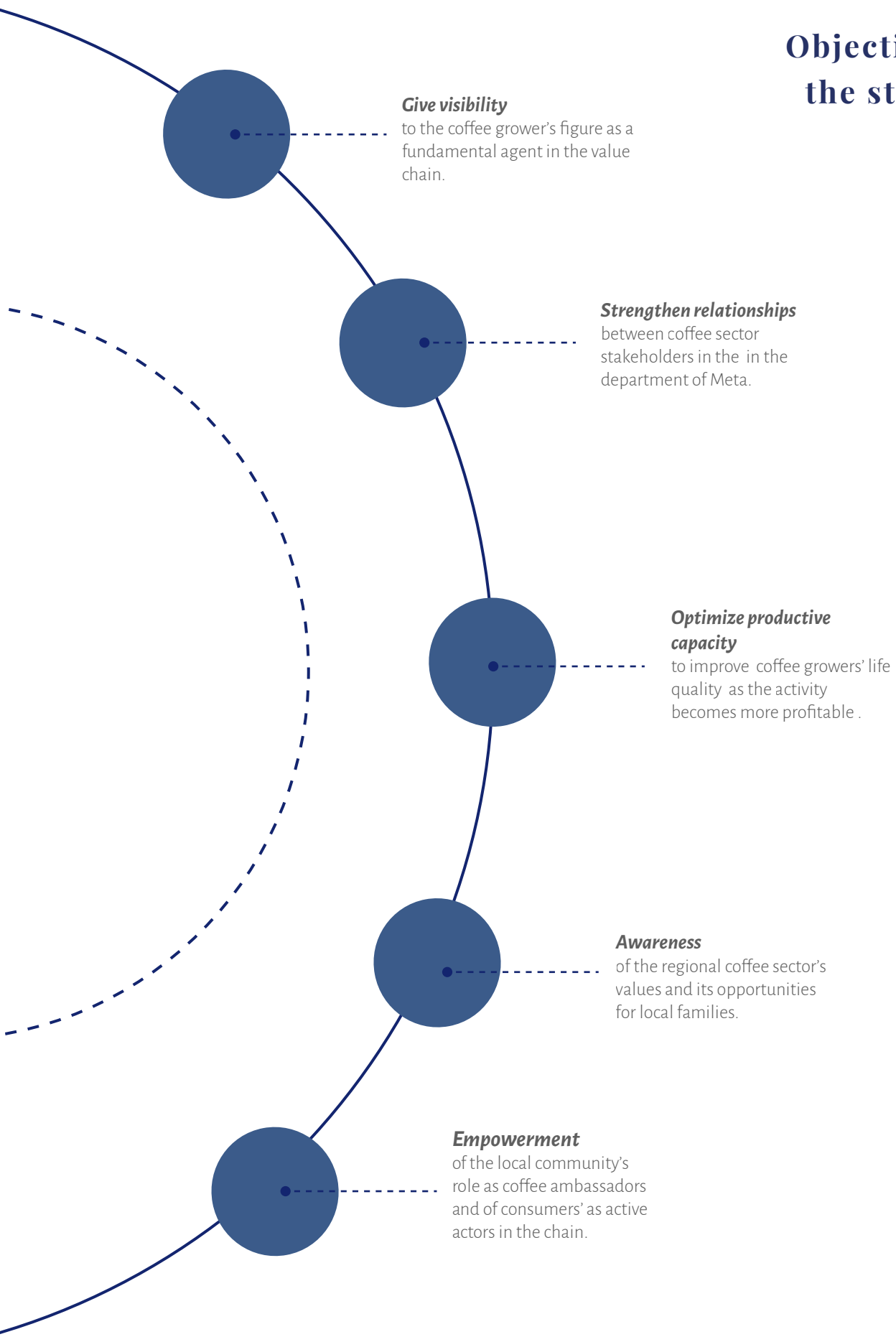


Fig. 55 Project pillars and strategy objectives

8.2 SHAPING FUTURE SYSTEMS

Más que Café is developed as a strategic program that seeks to achieve the recognition of coffee from Meta as a high quality product and the visibility of those who grow it. Supported by a network of actors ranging from the local to the international level, with the aim of strengthening the interaction between the rural coffee growing communities and the other actors of the chain, expanding the perception that local farmers have of the opportunities to promote more sustainable rural landscapes.

In the meantime, through an effective traceability system, the journey of the coffee throughout the entire production chain is made known, recognizing the work of the coffee growing families and the unique characteristics of the coffee cup profile of this region. Seeking not only to educate consumers about the coffee they drink, but through blockchain technology to empower them to make decisions that directly benefit coffee growers

Taking as a starting point these interactions between the actors, 3 components are proposed for the development of the program conformed by: Capability building, Consumer engagement experience and Coffee producers' founding network.

8.2.1 Services

Capability building

Good practices- Meta verde

The purpose of this component is to carry out training workshops on the implementation of good and sustainable practices. Taking education as a tool that has a direct impact on the coffee production chain, improving the technical capacities of those who work in the sector and want to improve the yield and productive capacity of their crops. Seeking to increase the harvested area as a function of the area planted, taking into account that the former refers to the total area from which production was effectively obtained, while the area planted refers to the area covered by seeds.

On the other hand, it seeks to support new coffee growers in developing local know-how to improve the quality profile of the department's product.

For this, it is necessary to begin to strengthen relations between local actors, such as associations and cooperatives, to rely on specialized figures from broader national and international spheres that can provide an advisory service that allows the expansion of the sector in a practical and efficient manner.

Fig. 56 Hermanos, Colombian Coffee Roasters, 2023

Know your coffee

Through this component the project intends to carry out coffee cupping activities, an activity known in the industry as a practice to learn about the quality of the cup's profile. The intention is to involve the local community, young people, and coffee growers of the region through shared tasting experiences, where they can identify and appreciate the characteristics and properties of their own coffee. Having as a sample the products of the local coffees themselves.

In this practice properties are considered in a qualitative and quantitative manner, perceiving factors such as aroma and flavor in order to determine its quality. The first part is guided by the analysis of green coffee, in which the defects of the bean are recognized. Subsequently the analysis of the cup of coffee is done on the ground and roasted coffee beans, in this stage characteristics such as fragrance, aroma, flavor, acidity, among others, are evaluated.

By developing these experiences, the influence of diverse factors and processing conditions on the quality characteristics of coffee can be recognized and determined. For the coffee growers that develop the experience, the support of the tasters provides a guide to what may be happening on their farms and their processes, receiving first hand feedback and information that is valuable for the producers in that it allows them to determine corrections and incorporate better specific practices in order to improve the quality of their coffee.

In this sense we refer to conscious standards that arise through shared spaces between producers and coffee chain experts, in a context where it is typically the producers who ask the buyer for the suggested prices for their coffee. They do not know its quality or the value of its cup profile.
In this way the people of the community are trained, giving them tools of knowledge that empower them in their role as actors that recognize, know and transmit the values of their coffee culture forging "coffee ambassadors".

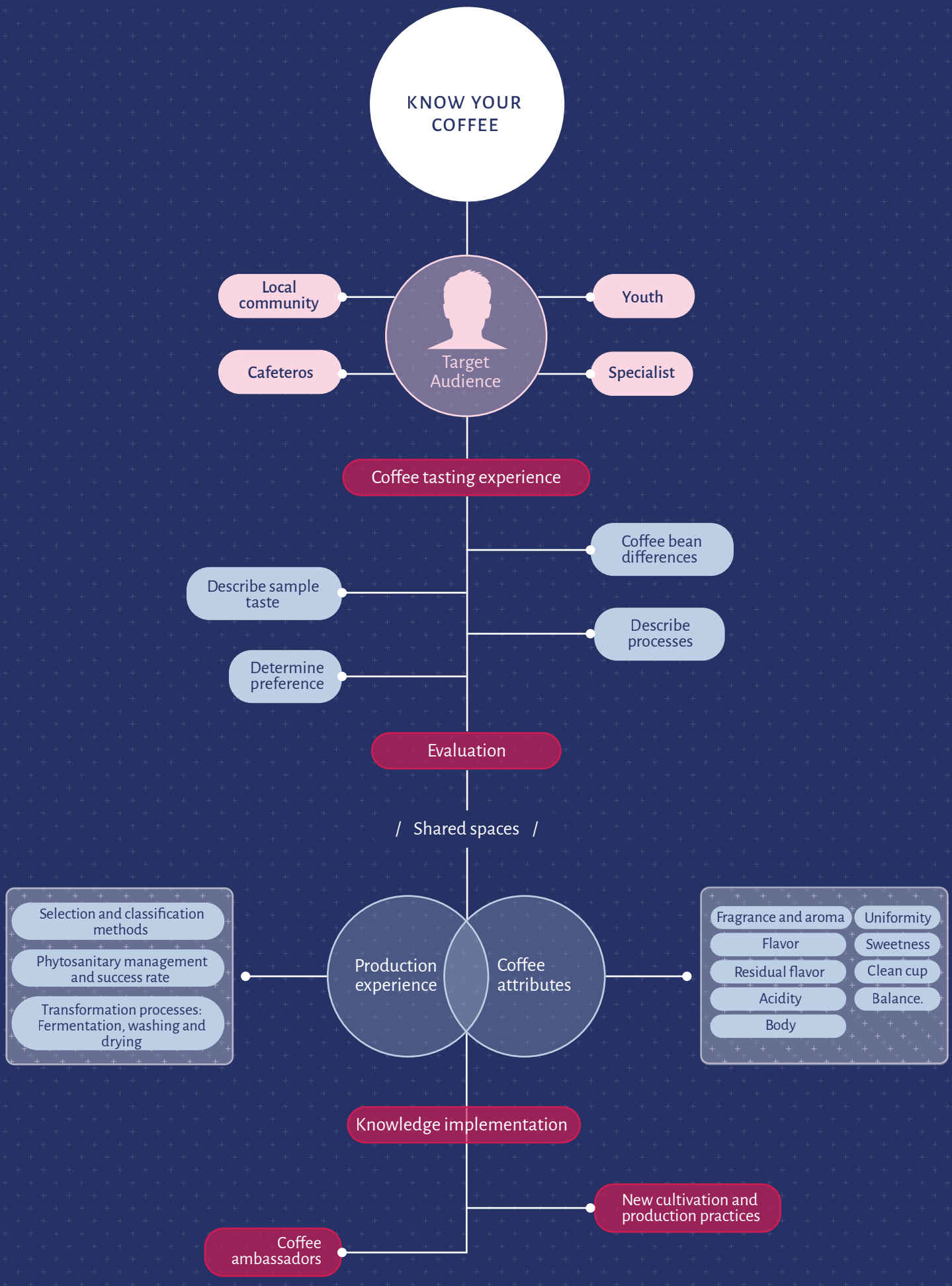


Fig. 57 Capability building. Meta verde and Know your coffee initiatives.

Consumer engagement experience

A solid relationship with coffee growers opens the door to traceability and transparency in the coffee chain. As consumers become more aware of the impact of their purchasing decisions, they want to know where their coffee comes from and the conditions under which it was produced. Through this component we propose to establish a bridge of interaction between the consumer and those who produce it.

Traceability- Taste tracer

By scanning Qr codes found on the product's packaging, the consumer will be able to trace the journey of their coffee along each step of the supply chain, from cultivation to the moment it reaches their cup.

The journey begins by letting the consumer know the place of origin of the coffee and the stories of those who grow it. Not only of life around their role as coffee farmers but also their local reality by letting them know 'who produces your coffee'. Allowing the actors of the supply chain to recognize the hard work of the producers and the way in which this activity directly influences their lives, as well as the different processes that are carried out on the farms prior to obtaining the final product.

Knowing everything about their coffee guarantees the responsibility of all those involved, paving the way to make the supply chain more sustainable.

In conjunction with the traceability tool, through a digital platform, it is intended to generate a journey in the understanding of the specific characteristics of the coffee cup profile, such as the flavor notes, acidity and body of the bean. Characteristics that are determined by the geographical, climatological, and topographical circumstances of the coffee-growing areas.

Each of these attributes will be presented to the customer, creating an immersive experience in its journey to understand the unique characteristics of each region, variety and even farm.
Information that is becoming increasingly important for all sorts of customers, including individual consumers, roasters, and shop owners, who will be able to share these tales and information, improving their entire experience with the coffee that they are getting.

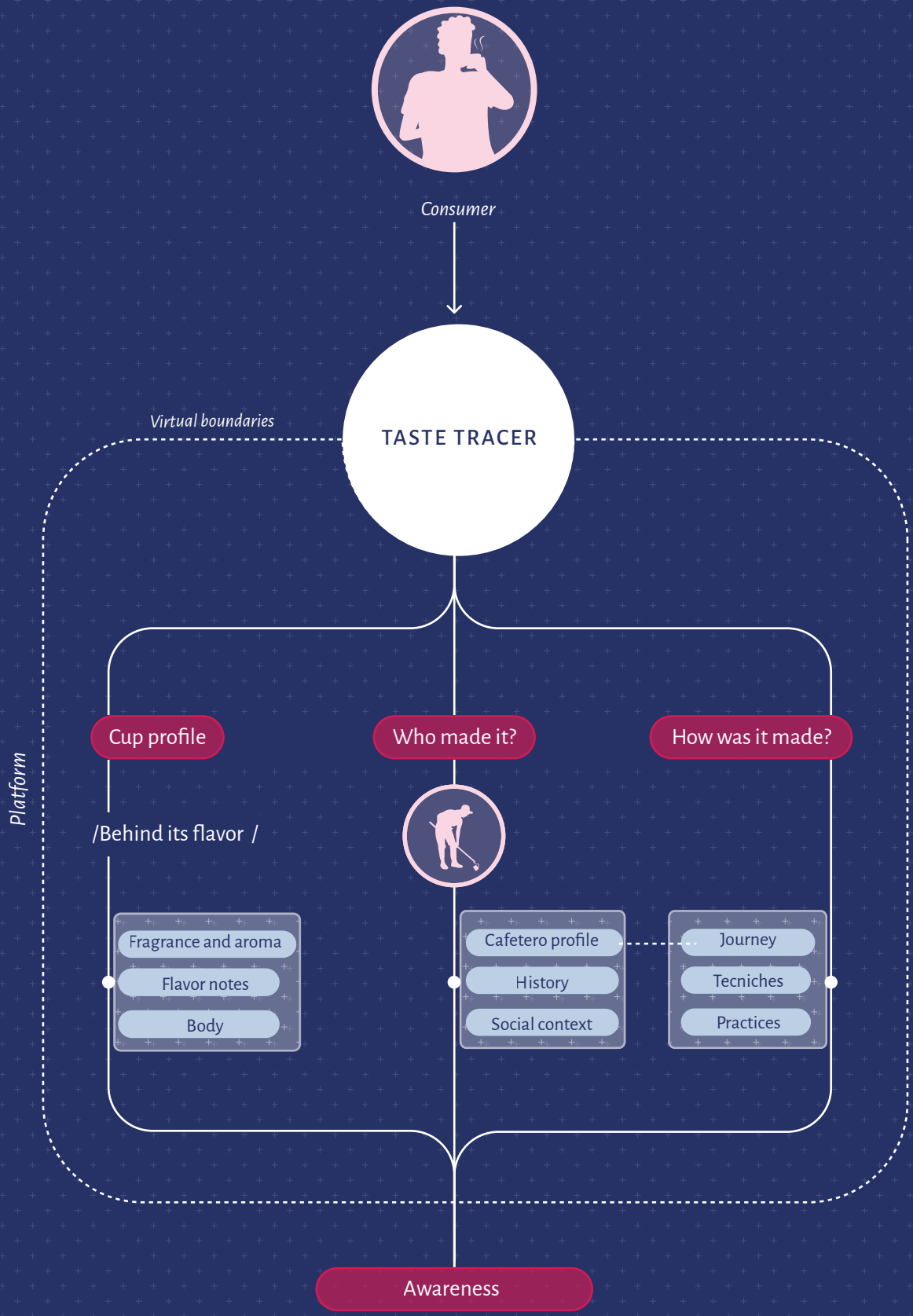


Fig. 58 Consumer engagement experience. Traceability with Taste tracer.

Coffee Funding Network

Strengthening the link between coffee growers and consumers also means creating channels of mutual support that encourage collaboration between them, including at an economic level. Beyond buying the product that he/she acquires, the consumer has the opportunity to directly finance the coffee grower that works to produce the coffee that he/she drinks, but also to earn benefits while doing so. Having brought both of them together through the previous services, the aim of this service is to generate additional motivation to carry out the interaction.

Blockchain- Coffee connect

The use of blockchain technology allows anyone to finance small coffee producers with no access to the traditional financial system, being a more inclusive economic system that shortens the value chain connecting coffee producers with consumers or interested investors. This system makes lenders not only make a profit but also benefit from the direct improvement of cafeteros' livelihoods through their own work, bringing them closer together, and collaborating without depending on third parties.

From an investing point of view, investors decide in which kind of fund they want to invest, choosing between different funding causes such as buying a family crop's production or investing to improve the productive infrastructure, or buying machinery to improve a farm's productivity. Blockchain funding services grant up to 8% annual return.

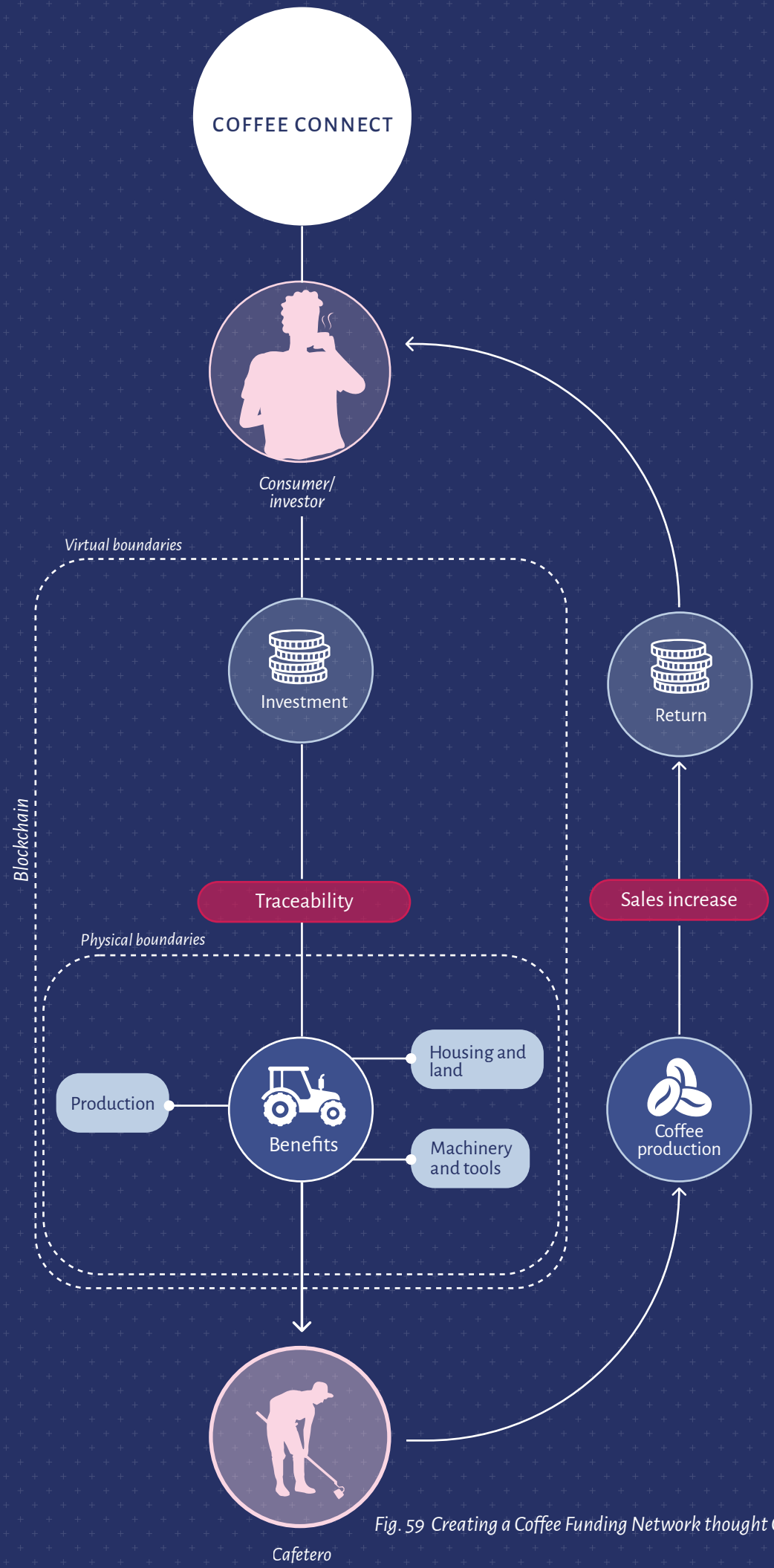


Fig. 59 Creating a Coffee Funding Network thought Coffee connect

8.2.2 Project team

The project team is constituted by four main sections:

Coffee community squad

Each municipality is given the task of choosing a group of representatives that include members specialized in different segments of the cafetero community.

Household representative:

Preferably someone who has lived for more than a decade in the municipality, who knows most of the other cafetero families and is actively communicating with them and representing their interests before the project team, focusing on social needs and coexistence dynamics. He/she acts as a bridge of information and requirements, as the voice of the coffee farming families of the entire municipality. Therefore, one of the role's responsibilities is to open dialogue spaces where members of the community can express their

opinions and make propositions to improve their livelihoods.

Coffee Leader:

This role is in charge of the technical and practical aspects of coffee production, accompanying the families in their productive activities, and inducting new coffee growers of the municipality to optimize their crop space and their sowing and post-harvesting techniques. In addition, the coffee leader is in instant communication with the household representative to convey the needs of the new coffee growers.

Youth delegate:

Just like the household representative, the youth delegate is in charge of promoting dialogue among te sons or heirs of the cafeteros. Whether they are already involved in their families' coffee production processes or not, the delegate is the voice of the next generations of coffee growers in the municipality and works hand in hand.

These three spokespersons, even though they have different responsibilities and work in different ways, are always updated with each other's feedback, reaching agreements on what is most urgent from the point of view of the entire municipal coffee community and presenting it to the rest of the project team.

Multidisciplinary team / Research, Development and Innovation Unit:

The multidisciplinary team, formed by the Research, Innovation and Development Unit and the Communication Unit, is the squad in charge of working on the project's services, improving its operation and developing new initiatives that, in line with the project's objectives, promote the development of the department's coffee-growing communities.

Systemic designers:

A group of three designers in charge of the ¡Tierra! Colombia - Meta project that constantly studies the context of the project, the industry and the consumption trends, updating the territorial and productive analysis and finding new criticalities to put in contrast with the coffee community squad. Jut as the present thesis, the designer team should develop new strategies and/or services to implement in the ¡Tierra! Colombia - Meta project framework.

Researchers:

Preferably specialized in agricultural studies or food industries, the research team coordinates the investigation that precedes the work of the design group, establishes databases useful to the entire multidisciplinary team and validates the sources from which theoretical and technical decisions are made in regards to the services' improvement.

Communication Unit:

Audiovisual and Multimedia Communicator:

The communication team creates the content that is shared through the different channels of the foundations, social media and the funding network platform. Also, they design the material that is used in the "Know your coffee" service.

Coordination committee:

This committee is composed of the current TC coordinators and those in charge of the foundations, both Fondazione Giuseppe e Pericle Lavazza and Carcafé, to oversee the project. They are presented with the improvement proposals developed by the multidisciplinary team based on what the Coffee community squad transmits. They make the decisions as to what is feasible to do and in what time frame, considering financial and human resources aspects.

¡Tierra! Colombia project team leaders
Fondazione Giuseppe e Pericle Lavazza spokesperson(s)
Carcafé spokesperson(s)
FNC representatives*

*This role may be in charge of the FNC in case it is included.

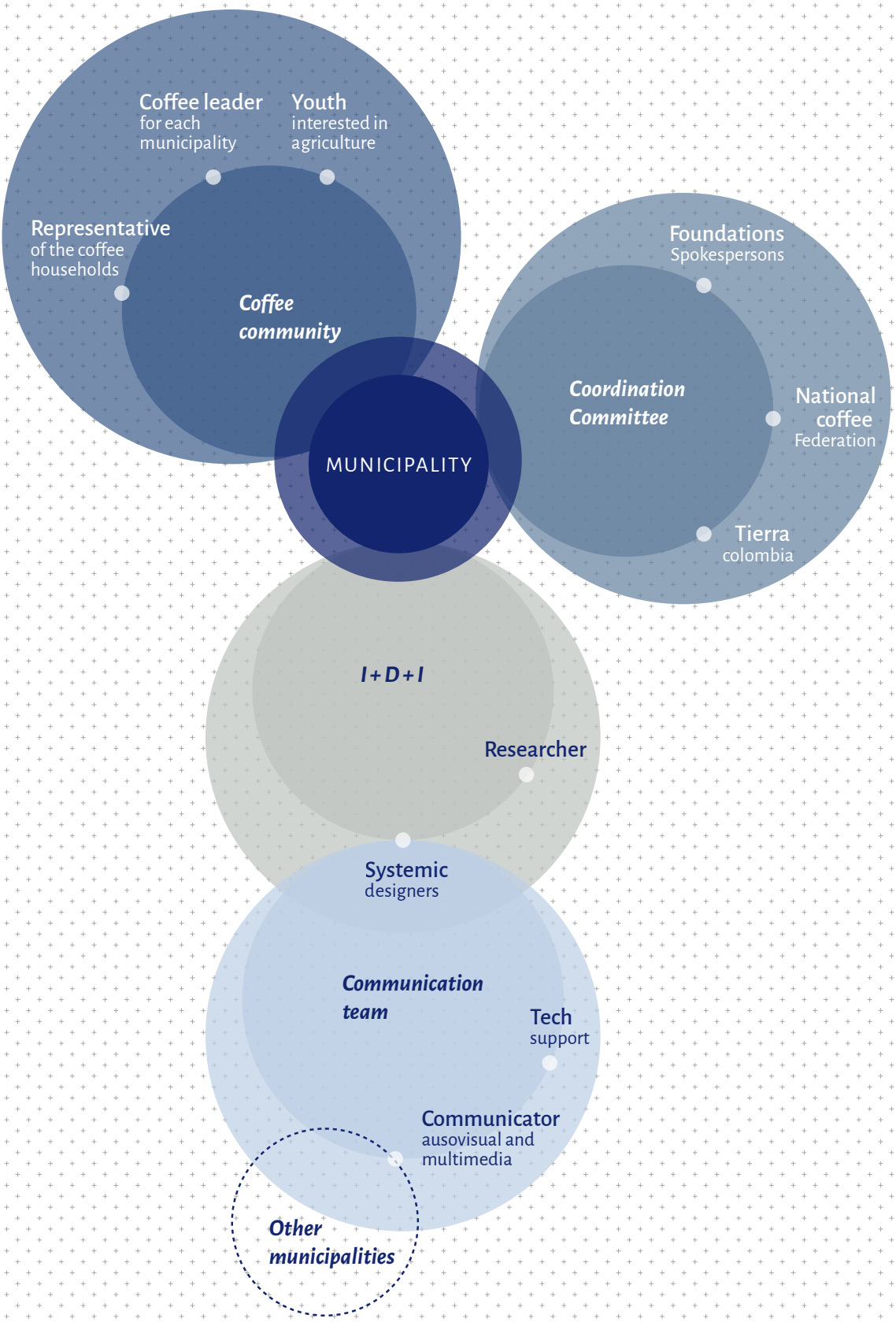


Fig. 60 Project team structure

	ACTOR	QUANTITY	ROLE
Coordination Committee	¡Tierra! Colombia	2 for Más que Café	Evaluate the proposals of the multidisciplinary team. Decision making. Approve the material shared on the platform.
	FNC	1 for the whole department	
	Foundations spokespersons	1 from each foundation	
Coffee community	Representative of the coffee households	1 for each municipality chosen by the community	Information and requirements bridge
	Coffee leader for each municipality	1 for each municipality chosen by the community	Induction to new coffee growers. Accompaniment to coffee growers of the municipality. Information and requirements bridge.
	Youth interested in agriculture	1 for each municipality chosen by the community	Generating participation and inclusion spaces for young coffee farmers. Participate in the organization's discussion tables.
Research, innovation and development unit	Systemic designer	3 chosen by those in charge of Tierra Colombia and community representatives	Critical points identification. Opportunity exploration. Project implementation proposal development.
	Researcher	1 chosen by those in charge of Tierra Colombia and community representatives	Research process direction. Database construction. Source validation. Research report drafting for design team.
Communication unit	Audiovisual and Multimedia Communicator	2 chosen by those in charge of Tierra Colombia and community representatives	Promotional strategy design. Audiovisual material design (graphic pieces, videos, etc.).
	Tech support	3 for the platform maintenance	UI/UX support Visuals updating

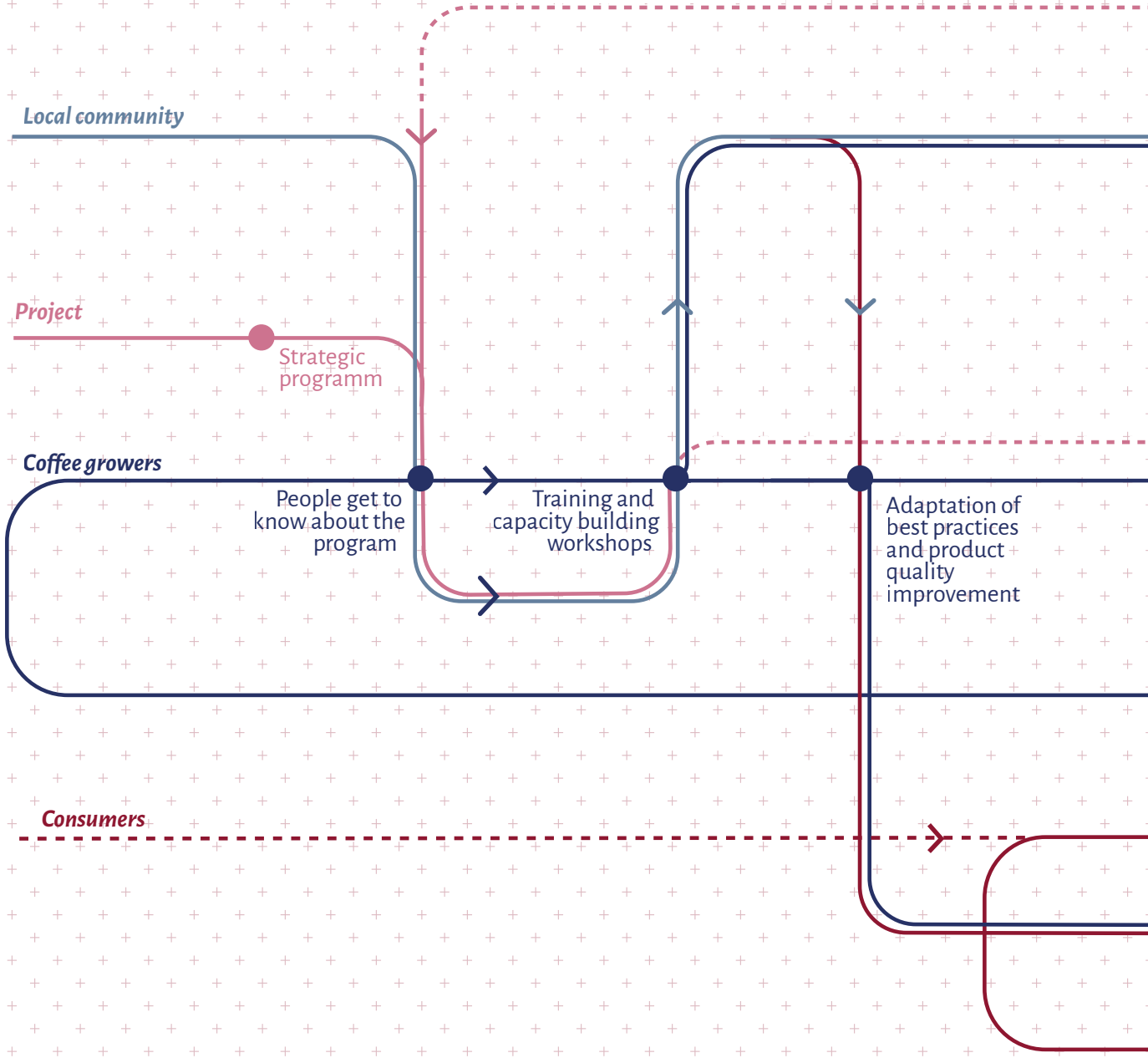
8.2.3 Narrative storyline

The strategic program foresees 4 phases of initial implementation, taking into account how the project reaches each of the main actors.

The first phase is focused on the promotion of the Capability Building component, having as its target public the coffee growers and the local community of the municipalities. In the second phase the development of the component is sought through know your coffee programs and educational programs focused on the development of good practices that allow for the improvement of the productivity of the crop and the increase in the quality of the product.

The third phase of the project is focused on the Consumer Engagement Experience, which begins with the purchase of the product, supported by traceability, the consumer gets to know the stories behind 'who produces your coffee' and develops experiences that allow him/her to understand the specific characteristics of the cup profile through the digital platform. The consumer will also have the possibility of integrating into the blockchain network to take part in the creation of impact on the coffee growing families of Meta. Empowering them to make decisions that directly affect the decent income of farmers, seeking to implement improvements in agricultural practices.

In this way it is possible to integrate social and ecological certification schemes that compensate farmers for better product quality and a more sustainable management of the ecosystem. This will have a positive impact on the quality of life of coffee growers as it becomes a more profitable activity, offering better quality products under sustainable standards.


Local community
Project
Strategic programm
Coffee growers
People get to know about the program
Training and capacity building workshops
Adaptation of best practices and product quality improvement
Consumers
Legend
(LINE TYPE AND DOT COLOR)
Project milestones
Feedback

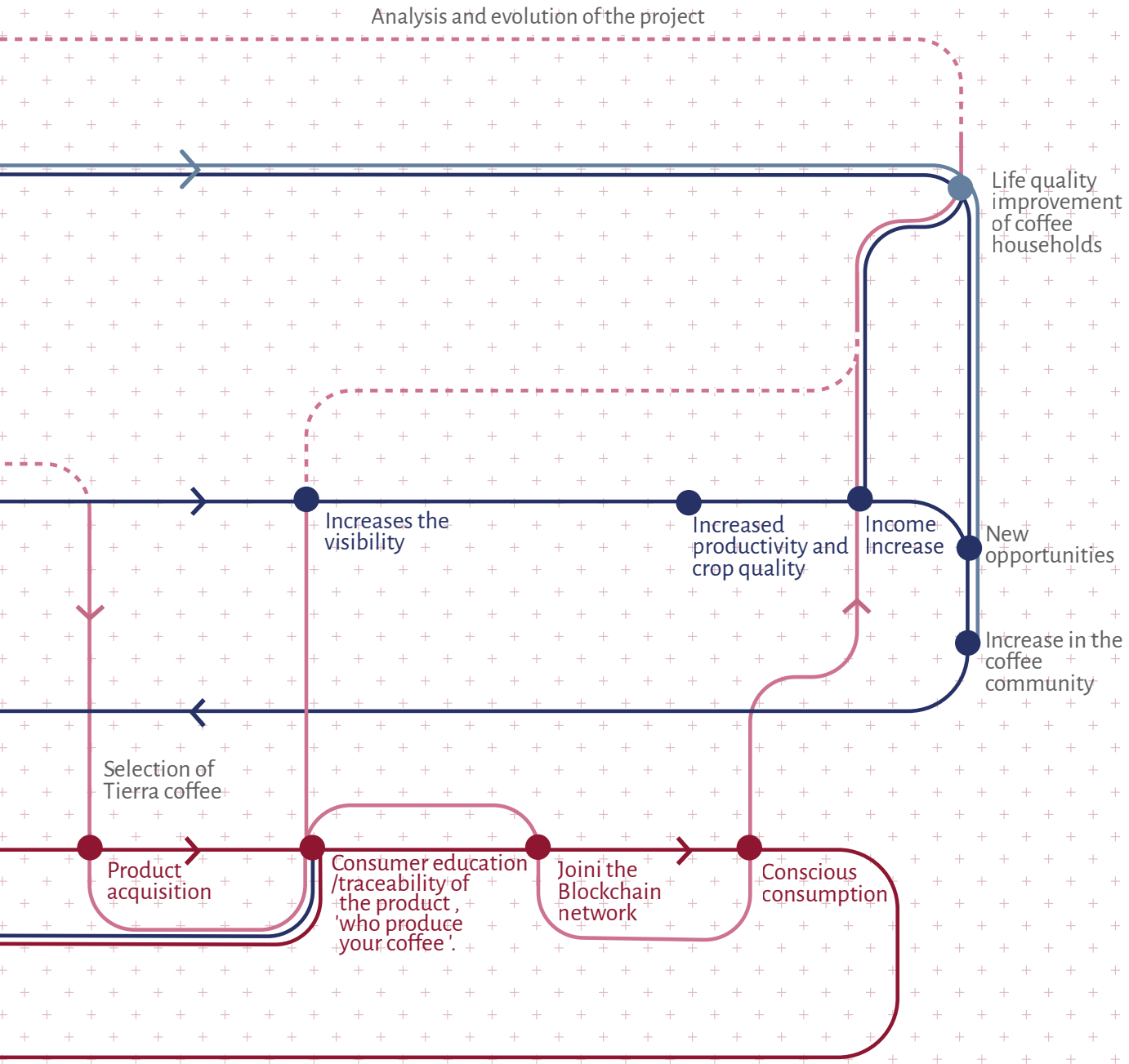


Fig. 61 Main interaction moments within the strategy

8.3 MAPPING STAKEHOLDERS

The relationships of the actors involved in the development of each of the components proposed in the strategy were visually traced, as well as the flows that exist from material, money or information. Identifying the actors from the local sphere with the municipalities, departmental and national sphere up to the international. Allowing to identify how the components are connected, highlighting the values exchanged by all the actors involved.

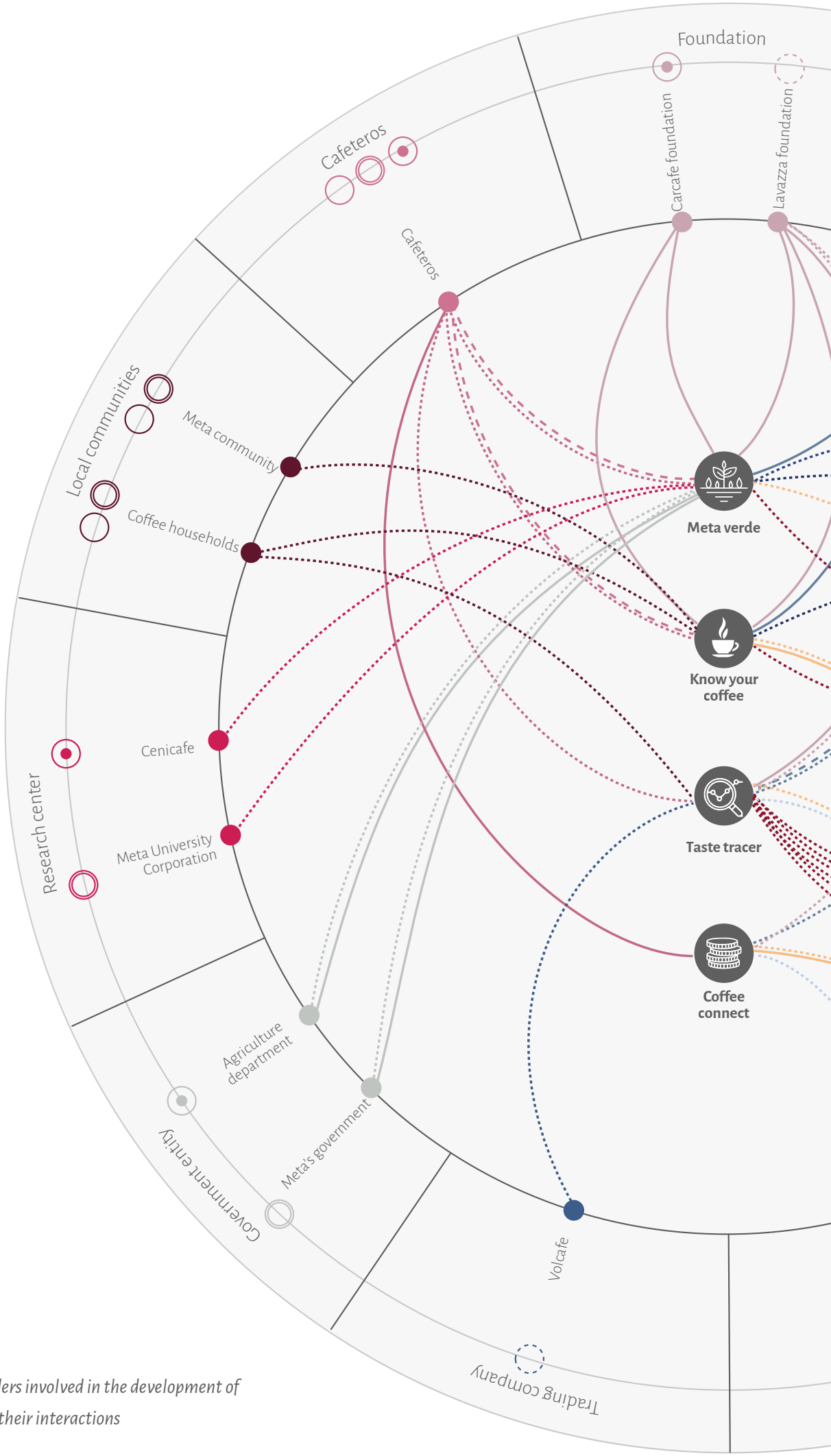
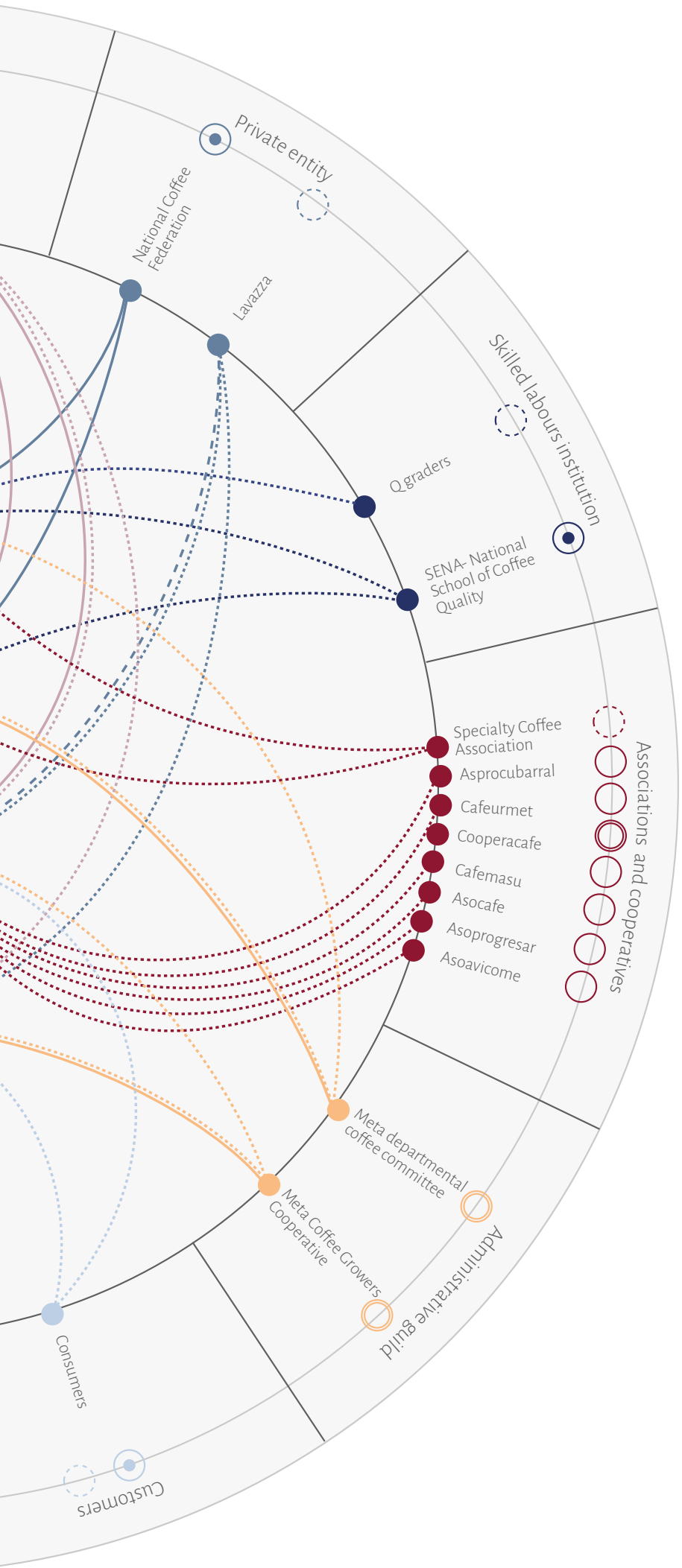


Fig. 62 Stakeholders involved in the development of the strategy and their interactions



STAKEHOLDERS

Stakeholder type
(CIRCLE COLOR)

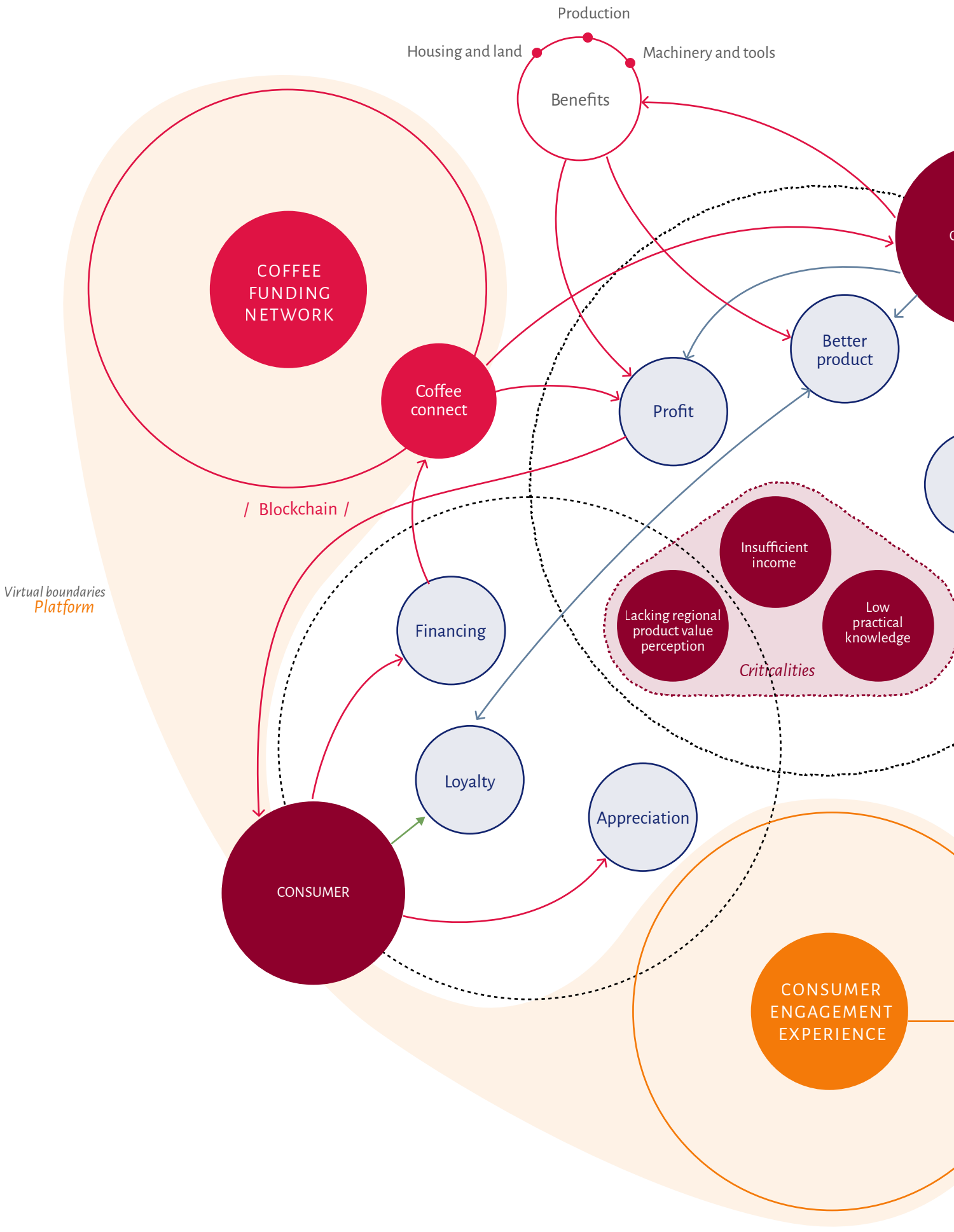
- Cafeteros
- Association
- Trading company
- Private entity
- Skilled labours institution
- Administrative guild
- Customers
- Foundation
- Government entity
- Research institution
- Local communities

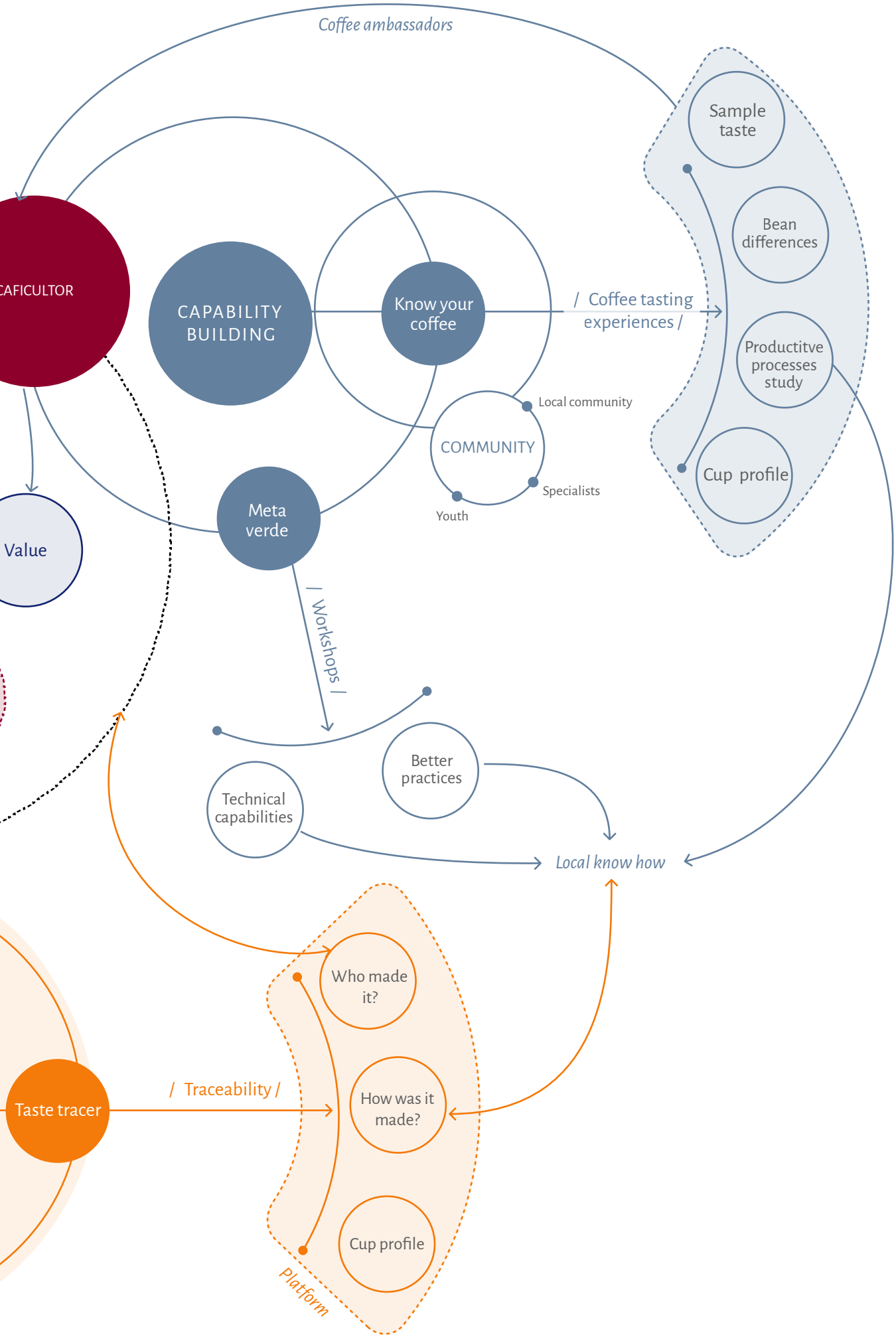
Interaction flows
(LINE TYPE)

- *Information*
- *Matter*
- *Money*

Scale

- *Internacional*
- *Nacional*
- *Departamental*
- *Municipal*


Production
Housing and land
Machinery and tools
Benefits
COFFEE FUNDING NETWORK
Coffee connect
Profit
Better product
/ Blockchain /
Virtual boundaries
Platform
Insufficient income
Lacking regional product value perception
Low practical knowledge
Criticalities
Financing
Loyalty
Appreciation
CONSUMER
CONSUMER ENGAGEMENT EXPERIENCE


Coffee ambassadors
CAFICULTOR
CAPABILITY BUILDING
Know your coffee
/ Coffee tasting experiences /
Sample taste
Bean differences
Productive processes study
Cup profile
Local community
COMMUNITY
Specialists
Youth
Meta verde
Value
/ Workshops /
Better practices
Technical capabilities
Local know how
Who made it?
How was it made?
Cup profile
Platform
Taste tracer
/ Traceability /

8.4 INNOVATION AREAS

Recognizing the areas of innovation where the project intervenes helps not only to understand its initial position but also to reveal opportunities for its future development and improvement.

Furthermore the strategy seeks to achieve a level of differentiation with respect to other projects already carried out through the innovation of its systemic approach. For the analysis and measurement of the innovative scope of the project, the **Doblin's 10 Types of Innovation model**, created by the Doblin Group, was used as a reference. This model proposes then types of innovation, structured in 3 macro-categories, configuration, offerings, and experience. Configuration analyzes the inner workings, offerings analyzes how products are sold, while experience examines how customers interact with the product or service. However, as we mentioned earlier, the project seeks to intervene in different areas and moments of the chain, so when making the analysis we took the sections into equal consideration.

The **configuration area** contains types of innovation that refer mostly to internal impacts, for our project understood within the context of rural coffee communities in the department of Meta. It is in this category where our project intervenes notably; this may be due to the fact that up to now the formulation of the project has been based on the proposal of a strategy focused on the specific conditions of the community taking into account the relevance of the internal system of the coffee sector in the department. This reinforces the proposal of a strategy, since a solid relationship with coffee growers opens the door to traceability and transparency in the coffee chain, establishing a bridge of interaction that functions as a basis for innovation in other spheres such as the consumer without leaving aside those who produce it.

Having as a central axis the coffee product around which the initiative is developed. When we speak of **offering innovation** we are mainly analyzing the improvements that are being proposed for the Meta coffee system and its promotion. The product system is one of the two areas with greatest consideration since the strategy is based on the proposal of new services that directly affect the productive chain. In terms of **product performance**, the intervention in this area includes training and support sessions aimed at improving practices and optimizing production capacity, seeking to increase harvested area in relation to planted area (harvested area understood as the total area from which production was actually obtained). Implementing improvements in agricultural practices allows to offer a better quality product, with the guarantee of sustainable certification schemes.

The **experience category,** where innovation is more oriented to the customer as another of the main actors of direct interaction within the proposal. We decided to adapt this particular section to the scope of the project, since the brand area did not apply to the projections of the initiative, but the concept did, which is why we applied it to communication. One of the main pillars of the project is visibility, which is addressed through clear and detailed communication strategies about the value of coffee and who produces it, which is why the communication element is regarded to be the most important of this category's other sections.

Fig. 63 Project innovation areas

On the other hand, **services innovation** receives less impact, however it is important to consider the way in which it complements the previously mentioned product system, as the changes in the system are based on the new offer of experiences and services

The analysis of the innovative areas in which the project takes action helps us to propose a starting point for its improvement and evolution. Thus, in the overview obtained, there are gaps that could require further consideration in the initiative. In the **configuration category**, the next step could be to strengthen internal processes in order to make operations more efficient; consequently, the profit model would not only have a more solid base, but also the space for new strategic proposals that represent a subsequent economic benefit.

For the **offering section**, the intervention of the initiative could be increased through a more active participation of design in strengthening the interactions between the actors around the product.

Concluding within the experience category, it is necessary to highlight the **customer engagement area** linking the actors through social ties to deepen the experience and encourage consumers to share common activities and offers that support them. The program proposes an empowerment of the consumer through a traceability network that not only seeks to educate the consumer but also to integrate them as an active participant with blockchain technologies in initiatives that have a direct impact on the development of the community and the coffee production chain.

09

The mark we left

9.1 Impacts

9.2 SDG's

9.1
IMPACTS

Projecting the effects of the project on the system begins by defining the time frame in which these impacts occur. Short-term means from the time of implementation of all project services through the first year of operation. The medium term is from the first year to the third year. The long term is after the first three years of the project. The intention is not to assert what will happen with the communities and the sector in those times, but to make a realistic interpretation of how the project grows and fulfills its objectives from several points of view, environmental, social, cultural and economic.

Environmental

Short term: Stopping bad practices in coffee farming communities and through the different services, it is possible to mitigate negative impacts on the environment. Endorsing good practices sets the starting point to prevent poor waste management-derived contamination of soil and water sources. With the awareness that sustainable practices can increase productivity through know-how services, cafeteros should begin to normalize them, becoming not only a technical requirement but also part of the community's cultural heritage.

Medium-term: Along with species preservation, the work of the project team should begin to transition to a dynamic where waste is quantifiable enough to establish how much is generated in every crop and therefore predict the curve of waste production in new crops or transformed (from illegal to legal) crops.

Long-term: As the system evolves and improves its self-maintaining dynamic, waste could be radically reduced to a degree where most of it becomes an input in the same and other productive chains. Local ecosystems find balance with coffee crops, becoming preservation points to many species that are not affected by the outputs of coffee harvesting

Social

Short term: The new landscape of how the crops could be perceived as attractive to new potential coffee producers in the municipalities. Additionally, by involving people from the community who do not necessarily have knowledge of the sector, such as the young population of local communities, spaces are opened that inspire and attract them to see coffee growing as an opportunity in which to build their life projects.

Medium-term: As young coffee farmers are included and positioned as part of the rural development process, the goal at this instance is to inspire ⅓ of the cafetero families' sons in the municipalities to maintain the coffee tradition, seeing it as a promising sector to work in, reaching the strategic objective of granting a proper generational splice. Seeking to create a generational link that will help micro, small and medium-sized enterprises (MSMEs) to fill their knowledge gap regarding the coffee quality, seeking to become involved with specialized markets of greater value and thus find a vocation in their own communities.

Long-term: The humble threshold of poverty in the department decreases considerably thanks to the proliferation of jobs generated by coffee cultivation.

Cultural

Short term: Locals start to consider good practices for coffee production as a standard that becomes tradition for years to come, developing a local know-how based on sustainability and circularity..

Medium-term: Local know-how becomes a big asset for the population, as their own traditions based on high-quality coffee and sustainability for the preservation of ecosystems and respect for their land begin. The department of Meta is considered as an example of how producer countries can exploit the coffee sector to be more competitive and have a bigger presence in international markets, inspiring other countries and study groups to promote circular and sustainable mindsets to

Long-term: Coffe is established as part of the department´s gastronomic staples. The symbol of the cafetero family is celebrated through new traditional municipal festivities born within the communities. The department is projected to obtain international patrimonial and cultural recognition that will continue to promote the image of the local product. The growing ecological tourism in the region attracts people from other departments of the country, giving major visibility to the department of Meta's values and traditions.

Economic

Short term: Coffee farmers receive new sources of income and start improving their crops, buying land and technifying their processes to get a better product.

Medium-term: New business opportunities arise for veteran and young coffee growers, initiating a dynamic of entrepreneurship that had not existed until then in the municipalities. Certified coffee eventually emerges as the goal for cafetero families to benefit from higher profit and recognition.

Long term: The business opportunities for both coffee growers and young coffee growers, who begin to collaborate with each other and find commercial partners in other regions of the country, and begin to achieve alliances with foreign brands or companies, have increased. New coffee clusters are born, bringing families together and creating a competitive environment to innovate and improve productive and commercial conditions.

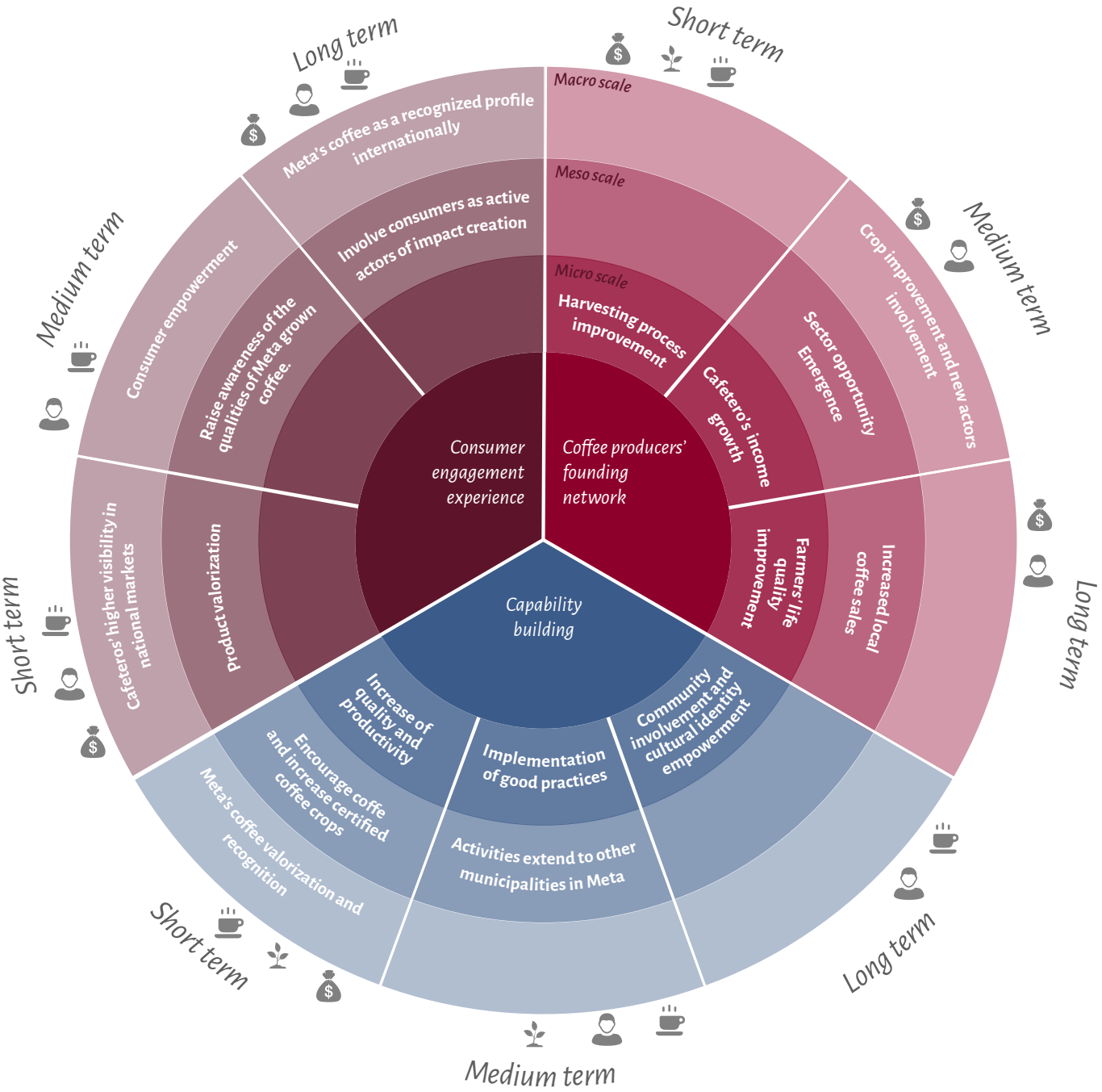


Fig. 64 Project Impacts

9.2 SDG'S

The project is developed locally and has its specific objectives in terms of the community it impacts and the sector it seeks to transform. However, in order to frame it in standards common to other countries and to clarify the contributions of Más que Café to the world, the UN Sustainable Development Goals are used to reflect the positive impacts that are in line with the lines of action that are part of the international agenda. In this sense, the SDG's on which the project is articulated are:

1. No Poverty: It is primordial for the project that coffee growers move away from the poverty in which 80% of coffee growers live at a global level and from the national poverty line.

8. Decent Work and Economic Growth: promoting a sustainable coffee system that increases its productivity and creates new decent and inclusive jobs in one of the key objectives of the strategy, considering only through expanding the productivity of the coffee sector in the department can the cafetero families earn more and dignify their living and productive conditions.

12. Responsible Consumption and Production: to ensure circularity and the proper functioning t¿of the new system, waste management and good practices in the production process are fundamental for the project. This allows to decrease the sector's influence in climate change and biodiversity loss.

17. Partnerships for the goals: The whole premise of Más que Café is to generate an environment where stakeholders can collaborate in order to increase product quality while maintaining new sustainable and circular standards.

10

Conclusions

Several limitations still impede the implementation of other improvements in the coffee system. From a governmental point of view, there is very little investment in infrastructure, which hinders the collection and transportation of products, including coffee. In spite of the fact that much work has been done in the post-conflict period, there is still a long way to go before violence ceases to be present in the department (and in the country). The debate around the eradication of illegal crops is still quite controversial and therefore it is essential to continue to develop strategies for transition to agricultural crops that are attractive to farmers in the region and demobilized members of armed groups who have been reintegrated into society.

The project proposes complex strategies to achieve realistic but ambitious objectives. In spite of this, the analysis of the territory has considered all the conditions that hinder going further in terms of a systemic transformation.

Although change is and must be gradual in this type of context in order to change the paradigm, there is an impediment that extrapolates to other sectors that are far from the scope of a project of this magnitude, which, although perfectly approachable from a systemic perspective, imply a very high degree of complexity, This translates into time and resources that such a broad approach would be difficult to obtain on the part of institutions, governments, and even communities because the more a project of this type is encompassed at a systemic level, the more the objectives and agendas of the parties involved clash.

The project exhibits great potential for driving positive change and fostering sustainable development within the coffee-growing communities of the Meta department. By focusing on collaboration, improving production quality, and promoting cultural resilience, the project seeks to create a more prosperous and competitive coffee sector. Through the implementation of innovative strategies, such as capacity building, consumer interaction experiences, and the establishment of a financial network, coffee farmers will have the opportunity to enhance their skills, engage with consumers, and access new markets.

Furthermore, the project's emphasis on sustainability aligns with global trends and consumer preferences. By implementing practices that prioritize eco-friendly production methods, traceability, and social responsibility, the project positions coffee growers in Meta as key players in the emerging conscious consumer market. Additionally, the project recognizes the cultural significance of coffee production and aims to preserve and promote the cultural heritage of the coffee-growing communities. By celebrating their traditions, stories, and resilience, the project not only enhances the value of Meta's coffee as a product but also strengthens the sense of identity and pride among the coffee farmers. This contributes to the socio-cultural well-being of the communities and empowers them to shape their own narrative in the coffee industry.

Overall, the systemic project in the Meta department presents a promising future for coffee farming families. Through its comprehensive and holistic approach, it has the potential to uplift their livelihoods, create sustainable economic opportunities, and increase their resilience to external challenges.

It is crucial to ensure the project's evolution, ensuring that it remains aligned with its objectives and adapts to the evolving needs of the coffee-growing communities and new challenges of the industry. With sustained support and collective efforts, the systemic project has the power to bring about meaningful and lasting positive impacts, not only in the lives of coffee farmers but also in the development of a thriving and sustainable coffee sector in the department of Meta, a promising territory for the world's coffe powerhouse, as is Colombia.

11

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