

## SHADED COFFEE FROM SERRA DE BATURITÉ, CEARÁ, NORTHEASTERN BRAZIL: ENVIRONMENTAL MANAGEMENT, SUSTAINABILITY AND ECO-SOCIOECONOMIC IMPACTS

*O CAFÉ SOMBREADO DA SERRA DE BATURITÉ, CEARÁ, NORDESTE DO BRASIL: GESTÃO AMBIENTAL, SUSTENTABILIDADE E IMPACTOS ECO-SOCIOECONÔMICOS*

*CAFÉ DE SOMBRA DE LA SERRA DE BATURITÉ, CEARÁ, NORDESTE DE BRASIL: GESTIÓN AMBIENTAL, SOSTENIBILIDAD E IMPACTOS ECO-SOCIOECONÓMICOS*

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Coffee growing;  
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### Abstract

The shaded coffee from Serra de Baturité, one of the few plantations in Brazil that integrates crop-forestry, is configured as an antithesis to the predominant agricultural model in our country, in monoculture. Known as “coffee from Baturité”, it is appreciated because it originates from the typical variety of the Arabica species (*Coffea arabica*) shaded, with production carried out by small rural family producers in a natural and artisanal way. Given this scenario, this article aims to verify the impact of the revitalization of the shaded coffee culture in the Baturité mountain range from initiatives aimed at tourism, environmental preservation and regional socioeconomic development. The methodological procedure adopted includes a bibliographical study, participant observation and semi-structured interviews with key sources. For that, the information was catalogued, analyzed and confronted, through data triangulation. The results show that coffee growing, inserted in the region two centuries ago (1822-2022), is in a revitalization phase. This reevaluation of cultivation, now with empirical and technical knowledge, has contributed to minimize the anthropic impact on mountain farming practices, to expand socio-environmental management on rural properties (where coffee has become a vector of sustainable development) and to foster the regional economy, as can be seen from actions aimed at ecotourism, rural entrepreneurship, and the circular economy.

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**Palavras-chave:**

Cafeicultura;  
Preservação ambiental;  
Desenvolvimento sustentável;  
Turismo.

**Resumo**

O café sombreado da serra de Baturité, uma das poucas plantações no Brasil que integram lavoura-floresta, configura-se como uma antítese ao modelo agrícola predominante em nosso país, em monocultivo. Conhecido como “café de Baturité”, é apreciado por ser originário da variedade típica da espécie arábica (*Coffea arabica*) sombreada, com produção realizada por pequenos produtores rurais familiares, de forma agroflorestal. Diante desse cenário, o presente artigo objetiva verificar o impacto da revitalização da cultura do café de sombra na serra de Baturité a partir de iniciativas voltadas para o turismo, preservação ambiental e desenvolvimento socioeconômico regional. O procedimento metodológico adotado contempla estudo bibliográfico, observação participante e entrevistas semiestruturadas, com fontes-chave. Para tanto, as informações foram catalogadas, analisadas e confrontadas através da triangulação dos dados. Os resultados evidenciam que a cafeicultura, inserida na região há dois séculos (1822-2022), se encontra em fase de revitalização. Essa revalorização do cultivo, agora com conhecimentos empírico e técnico, vem contribuindo para minimizar o impacto antrópico na prática agrícola serrana, ampliar a gestão socioambiental nas propriedades rurais (onde o café se tornou um vetor de desenvolvimento sustentável) e fomentar a economia regional, como se observa a partir das ações voltadas para o ecoturismo, o empreendedorismo rural e a economia circular.

**Palabras clave:**

Cultivo de café;  
Preservación del medio ambiente;  
Desarrollo sostenible;  
Turismo.

**Resumen**

El café de sombra de la Serra de Baturité, una de las pocas plantaciones de Brasil que integra cultivo-silvicultura, se configura como la antítesis del modelo agrícola predominante en nuestro país, en monocultivo. Conocido como “café de Baturité”, es apreciado porque proviene de la variedad típica de la especie arábica (*Coffea arabica*) de sombra, con producción realizada por pequeños productores rurales familiares de forma natural y artesanal. Ante este escenario, este artículo tiene como objetivo verificar el impacto de la revitalización de la cultura del café de sombra en la sierra de Baturité a partir de iniciativas orientadas al turismo, la preservación ambiental y el desarrollo socioeconómico regional. El procedimiento metodológico adoptado incluye estudio bibliográfico, observación participante y entrevistas semiestruturadas con fuentes clave. Para ello, la información fue catalogada, analizada y confrontada a través de la triangulación de datos. Los resultados muestran que la cafeicultura, inserta en la región hace dos siglos (1822-2022), se encuentra en una fase de revitalización. Esta revalorización del cultivo, ahora con conocimiento empírico y técnico, ha contribuido a minimizar el impacto antrópico en las prácticas agrícolas de montaña, a ampliar la gestión socioambiental en las propiedades rurales (donde el café se ha convertido en un vector de desarrollo sostenible) y a impulsar la economía regional, como se desprende de las acciones dirigidas al ecoturismo, el emprendimiento rural y la economía circular.

## INTRODUCTION

In the state of Ceará, located in the northern portion of the Northeast region of Brazil and that has 92.1% of its territory inserted in the Brazilian semi-arid region (Funceme, 2017), there is the Serra de Baturité, an exception landscape, in the midst of the caatinga domains, where vegetation with physiognomic patterns of humid forest predominates (Sudene, 2018). The mountainous region has its history of settlement and development intertwined with agricultural production, with emphasis on coffee farming, inserted two centuries ago, 1822-2022 (Semace, 2010; Pinheiro & Silva, 2017).

With the need to preserve the mountainous area from anthropic action (deforestation, burning, and real estate expansion) intensified between the second half of the 18th century and during the 20th century, the Environmental Protection Area (APA) of Serra de Baturité was created in 1990 (Cavalcante, 2005; Semace, 2016), which became known as the APA de Baturité. Serra de Baturité has a total area of 38,220 hectares, of which about 85% corresponds to the APA of Serra de Baturité, which represents an area of 32,690 ha (Marques, Aragão & Zanella; 2017). It is, from a bioclimatic point of view, one of the most important wet forest enclaves in Ceará (Bétard, 2012; Semace, 2020).

The legal measures for environmental conservation of the APA Baturité have been contributing to the implementation of actions and/or programs that aim to enhance socioeconomic and environmental gains from the revitalization of the production of shaded coffee associated with tourism (Queiroga, 2021; Farias & Farias, 2022). It is important to add at this point that the referred area is inserted in the tourism route of the inland humid mountains of the state of Ceará, in the segments: ecotourism, agrotourism, adventure, rural, cultural, sustainable, events, among others (Oliveira, 2016).

According to the historical context, the agricultural activity in the mountains of Baturité covers horticulture, fruit farming, grain cultivation, floriculture and coffee farming, however coffee was responsible for consolidating the settlements and the economy of the sites that, in turn, gave rise to the current highland cities (Queiroga, 2021). Not by chance, in the nineteenth century Baturité was responsible for 2% of the Brazilian coffee production, even winning the international spaces, since "there are reports that the French greatly appreciated the coffee grown on the lands of Baturité, thus being its largest import customers" (Silva Neto, Oliveira & Viana Filho, 2017, p. 3).

The highland coffee production in Baturité went through three stages of production: full sun (initial phase), transition period (sun and shade) and shaded (current phase). The monoculture production impacted the clearing of native forest, the depletion of nutrients in the soil, and caused excessive solar radiation on coffee cultivars, resulting in the loss of the coffee plant's productive potential. At this point, it is worth mentioning that the Serra de Baturité is located near the Equator (just over 4° South Latitude), which makes the sun's rays intense, making it necessary to adopt shading on the coffee trees (Revista Cafeicultura, 2011).

The transition period was marked by the introduction of coffee trees in the middle of the native forest, causing a period of mixed production (sun and shade). In 1862 a new productive paradigm begins in the region, the shaded coffee (Saes, 2003; Revista Cafeicultura, 2009). Over the years, this process has undergone technological adaptations and improvements in cultural treatments that are contributing to increased productivity and planting density, number of plants per unit area (GMB, 2022).

The “coffee of Baturité,” as it is known, previously appreciated for its 100% Arabica content (*Coffea arabica*), a typology that provides a superior quality drink with more aroma and flavor that please the palate (Sepúlveda, Chekman, Maza & Mancilla, 2016; Queiroga, 2021), conquered consumers for also being produced in agroforestry system, free of chemical additives, becoming “ecological Arabic coffee” (Revista Cafeicultura, 2009, p. 3). However, coffee farming ceased to be the main economic activity in Serra de Baturité with the end of the coffee cycle in Brazil, which lasted from 1800 to 1930 (Abic, 2021).

In the beginning of the 21st century, more precisely in 2003, in order to strengthen the coffee production with technical assistance and rural credit, the Cooperativa Mista dos Cafeicultores Ecológicos do Maciço de Baturité (Comcafé) implemented the Project “Café Ecológico” (Saes *et al*, 2003) in partnership with the Government of the State of Ceará; Brazilian Service of Support to Micro and Small Enterprises (Sebrae); Banks of Brazil and the Northeast, Company for Technical Assistance and Rural Extension of Ceará (Ematerce), among others (Amorim & Assis, 2022).

In turn, Sebrae (regional Baturité), in partnership with the City Hall of Baturité, mountain coffee growers and rural entrepreneurs, started in 2013 the “Programa Café Verde” focused on the sustainable development of the mountain coffee culture (Sebrae, 2015). In 2015, it created the “Rota Verde do Café” (Green Coffee Route), focused on the historical and cultural rescue of coffee, economic growth in rural areas and sustainable development, and in 2022, it worked on the implementation of the I Ceará shaded coffee Reference Center (Nogueira, 2022), located in the rural highland area of Baturité, in order to strengthen coffee farming, tourism and socioeconomic development of the region. It is worth informing that in Ceará the poles with more tourist flow are Litoral Leste, followed by Baturité and Ibiapaba (Ceará, 2016).

Given this contextualization, the starting question that directed the present research is presented: What is the eco-socioeconomic impact of the revitalization of the shaded coffee for the small rural producer of the mountains of Baturité? In light of the above, the objective of the study was to verify the impact of the revitalization of the shaded coffee culture in the Baturité mountain range, based on initiatives focused on tourism, environmental preservation and regional socioeconomic development.

This article includes four sections, starting with this introduction. The first section includes the theoretical background, which dialogues with authors about the issues addressed in this study. Next, there is the methodology, which gathers the set of procedures for data collection and analysis. Next is the description of the results achieved with the research. The last section comprises the final considerations, where the answers given to the objective and the question that guided the research are described.

## **THEORETICAL BACKGROUND**

### **“Baturité, the Land of Coffee: the socioeconomic impact of coffee-growing insertion**

In Northeastern Brazil, in the midst of the semi-arid domain of Ceará, a pre-Cambrian geological formation stands out, called the Baturité massif (or mountain range), which houses a vegetation composed of humid tropical forest, with remnants of the Atlantic Forest (Semace, 2020), presenting

abundant biodiversity and high ecological value (Cavalcante, 2005). The mountainous relief contemplates a total surface area of around 800 km<sup>2</sup> and medium and low altitudes (600-1200 m), standing out the abrupt and sinuous planed surfaces that characterize the sertão (Bétard, 2012).

Ceará, with an area of 148,886.3 km<sup>2</sup>, is the 4th largest state in the Northeast region and the 17th among Brazilian states in terms of extension (IBGE, 2021). Known as “land of light”, for its coastal area, and as “Alencarina land”, in honor of writer José de Alencar (1829-1877), it also stands out for the production of shaded grown coffee, in the Baturité mountains. The word Baturité is used to designate a municipality, a geological formation (mountain range) and an administrative macro-region (Maciço de Baturité) with 13 urban centers, which together represent 2.49% of the area of the state of Ceará and 4.37% of its population (IBGE, 2021).

The municipalities of the Maciço de Baturité, located between the Sertão Central of the State and the metropolitan region of Fortaleza, are divided into three sub-regions, being

the first: the sub-region Serrana, also known as “green corridor”, composed of the urban centers of Aratuba, Guaramiranga, Palmácia, Pacoti and Mulungu; the second, contemplates the sub-region of the Valleys/Sertão and comprises Baturité, Capistrano, Itapiúna, Aracoiaba, Redenção and Acarape; and the Sub-region of Transition composed of Barreira and Ocara (Ceará, 2014, p. 83).

The geographic set, grouped by political-institutional, geoenvironmental, socioeconomic aspects and the interaction between natural and cultural elements, has Baturité as the first urban nucleus, which contemplated several highland communities that became urban centers (Bétard, 2012).

Baturité and its highlands, in the 17th century, was inhabited by the Canindés (or Kanindé), Paiaçús (or Baiaçú) and Jenipapos (or Baturités) Indians, the latter settled in the high parts of the mountain range (IBGE, 2018; Girão, 2000; Catão, 1937). The indigenous groupings located in the foothills, in 1759, helped compose the settlement of “Missão de Nossa Senhora da Palma”, which rose to the village of “Monte-Mor o Novo d’América” in 1764, became known as Vila de Baturité in 1841, and became the city in 1858 (Campos, 2000; IBGE, 2018). According to Alves (2018), the toponym Baturité became popular among the natives and the sertanejos who migrated to the highland region during the “Drought of the Three Sevens” (1777-1778) and the “Great Drought” (1791 and 1793).

The Baturité massif, also known as Serra de Baturité, is the largest and most representative crystalline residual relief of the state of Ceará. [It is an area of “vegetational relics”, due to its biological importance, or “country man’s refuge”, due to its potential for extractive and agricultural use (Oliveira & Araújo, 2007, p. 62).

Nascimento, Souza & Cruz (2010) advocate that in Ceará the agricultural cycles of sugar cane (*Saccharum officinarum* L.) and coffee (*Coffea* sp.) were responsible for the formation of urban centers in humid and exception environments. In Serra de Baturité, the intensification of settlement occurred throughout the first half of the nineteenth century, when several farms, which were formed by the agricultural production of fruits, vegetables and sugar cane, started to produce coffee (Queiroga, 2021).

The coffee culture, inserted in 1822, in the highlands of Baturité, emerged before the expansion of coffee farming in Brazil, intensified from the second half of the nineteenth century (Lima, 1946; Girão, 2000). The product was one of the vectors that boosted the demographic, socioeconomic and political growth of Baturité and its highlands. One of the symbolic milestones was the creation of a bronze coin, in 1895, minted in Portugal, which circulated in the region and had the value of a promissory note (Oliveira, 2016).

The coffee culture was initially introduced based on the production chain of the monocultural system adapted to the climatic conditions and the mountainous relief (Ribeiro & Rufino, 2018), contributing to make Baturité the “food granary of Ceará”. To better balance, the city was one of the centers of production, collection and distribution of agricultural food to the state capital, Fortaleza (Oliveira, 2007; GMB, 2022). On the other hand, along with progress, the process of environmental aggression intensified (the forests and the areas destined to coffee culture were being reduced), and in the course of time its production was also being reduced due to the aging of the coffee plantations and soil wear (Queiroga, 2021).

Faced with this new reality, shaded coffees emerged at the end of the 19th century. The productive landscape of the highlands changed as small farmers began to realize that coffee trees under the forest canopy could withstand bad weather, excessive solar radiation, and rainfall, and started to use shaded planting (Ribeiro & Rufino, 2018). In this scenario, coffee trees began to be shaded by native and/or exotic plants, especially camunzé (*Pithecellobium polycephalum*) and ingazeira (*Inga fagifolia*).

The integration of the tree component to the agricultural one favored a better environmental management, which impacted the balance between the living and non-living components of the soil, the consortium of cultures, and the natural control of undesirable pests and insects (Ribeiro & Rufino, 2018) besides establishing a new social paradigm of environmental awareness, resonating in the search for sustainable alternatives for the regional socioeconomic development, with a focus on the highland tourism potential and its coffee tradition.

Today, Baturité stands out for pioneering the insertion of coffee farming, production in agroforestry system, revitalization of shaded coffee production and entrepreneurship focused on the coffee-tourism axis, a reality that led the municipality to receive the title “Land of Coffee” (GMB, 2022).

### **Coffee Tourism: Coffee as an Indigenous Element of Baturité**

Tourism, a word of French origin (tour) which means “return”, is performed by people during trips to places different from their usual environment, for a period of more than 24 hours and less than a year, with the purpose of leisure, business and others (OMT, 2001). The activity is intrinsically linked to the hotel, food, transport and trade sectors, offering goods, services and products that cater to different age groups, tastes and consumption patterns.

The tourist activity involves different modalities, among them the sustainable, for having environmental protection as one of its pillars; the cultural, which values the socio-cultural potentialities and traditions of a region (Brazil, 2018); the gastronomic, with new food experiences and affective taste experiences; ecotourism, which uses natural and/or cultural resources in a responsible way (OMT, 2001); experience tourism, which favors the interaction between the traveler and the environment, with an emotional connection; and “coffee tourism,” which aims to promote immersive itineraries to places that produce, handle, and market coffees (PRODETUR, 2016).

In the Northeast of the country, in the middle of the winding mountains of the Maciço de Baturité, in the hinterland of Ceará, the Green Coffee Route creates a unique experience for the tourist. The region's coffee is nicknamed "typical Arabica coffee" for its milder and sweeter characteristics. The route creates an immersion through history, culture, and gastronomy, getting to know plantations, the colonial mansions, and enjoying all the richness of the Ceará highlands (BRASIL, 2023).

According to Bérlato (2021), the shaded coffee produced in the mountains of Baturité has been impacting positively on the local economy, as it solidifies itself as one of the national coffee tourism routes. At this point, it is important to situate that activities related to the tourism sector were responsible for the growth of 2.9% of the Gross Domestic Product (GDP) of Brazil in 2022 (BRASIL, 2023).

It is worth noting that the insertion of shade in coffee cultivars changed the man-nature relationship, making the Baturité Mountains a reference in the production of "special shaded coffees", in a biodiverse agroforestry system (Ceará, 2020). Agroforestry rescues the ancestral form of land use, combining forest vegetation with crops of agronomic importance (Rocha, 2014).

Thus, the "coffee of Baturité", which became agroecological from knowledge accumulated over the years, through "observation-reflection-action", gained more strength with the implementation of the APA of Serra de Baturité, three decades ago. The Conservation Unit is classified as sustainable use, where it is possible to carry out agricultural activities, as long as the production is ecologically based and respects environmental regulations (Semace, 2020).

The APA of Baturité has been contributing to integrate the socio-political, cultural, economic and ecological components in favor of actions aimed at sustainable development, with emphasis on tourism associated with shaded coffee (Nogueira, 2022). The Baturité mountain range has natural attractions (mild climate, hydrography, diversified fauna and flora and the contrast between the mountains and the backlands) and Baturité stands out for its coffee tradition, urban and rural architecture, houses, farms and ranches built during the coffee golden period (Farias & Farias, 2022).

The Baturité and Baturité mountains tourist activity is inserted in the Ceará's tourist macro-region, called Wetlands/Baturité Mountains, and covers public policies at national, regional and state level, contemplating the

Action Program for the Development of Tourism in the Northeast (PRODETUR-NE), the National Policy for Regional Development (PNDR), the federal and state multi-year plans Participatory and Regionalized Multi-Year Plans (PPA), participatory budgets (PB), The regionalization programs of tourist regions in Macro Regions tourist (MRT's), preparation of action plans as Regional Development Plan (PDR) and subsidy plans for tourism planning in the Maciço de Baturité (Oliveira, 2016, p. 329).

The public administration of Baturité together with Sebrae/Baturité and in partnership with highland coffee growers, highland municipalities and rural entrepreneurs have been implementing actions and/or programs aimed at tourism associated with the productive tradition of shaded coffee, present in the region for 160 years (1862-2022).

Tourism linked to the coffee culture of the highland cities of Baturité gained more prominence from the “Rota Verde do Café” - RVC, which began in 2015. The partnership between Sebrae/Baturité, municipalities of Baturité, Mulungu, Guaramiranga and Pacoti, coffee growers and rural entrepreneurs aims the socioeconomic development from sustainable tourism, in its various aspects (Sebrae, 2015). Adventure tourism includes the “Coffee Trail” of Guaramiranga, a walk through the environmental protection area amidst centennial coffee plantations (Sebrae, 2015); the “Coffee Trail” of Baturité, which covers Baturité and the Baturité mountains, with the categories of bicycle, motorcycle and quadricycle; and the mountain “Ecological Trail”, a walk where the hiker sets up the itinerary (Sebrae, 2017).

In the scope of gastronomic tourism, in 2019, the I “Ceará Organic Food Festival” began, an event, of international nature, which brought together several segments of the food chain, with emphasis on the production of shaded coffee (IFCE, 2019). The festival featured lectures, gastronomic workshops, cultural presentations and agroecological fair, in addition to the presence of representatives from Sweden, Bolivia, France and Uruguay, academics. The regional audience was composed of farmers, coffee growers, gastronomes, rural entrepreneurs, and members of the Commission of Organic Production in the State of Ceará (CPOrg/CE).

Several events emerged in the post-pandemic, in 2022, among them the “I Coffee and Chocolate Fest of Guaramiranga” with programming including live music, hot chocolate and coffees produced in Mulungu, Guaramiranga and Baturité (Revista Ceará, 2022). In order to strengthen the connection between the highland municipalities, in 2013, the “Caminhos do Maciço Route” was started, an extension of the CVR, which aims to disseminate the history, culture, and regional coffee production through gastronomic and cultural attractions (Sebrae, 2018).

In cultural tourism and experience tourism, the “Coffee Harvest Festival” stands out, starting in 2017, where there was the rescue of the celebrations that used to occur after the harvest (Felix, 2016). In this period, there are visits to coffee producing localities, centennial houses from the golden period of coffee, the “Museum of the Railway Station” of Baturité, inaugurated in 1882 (GMB, 2021) and the “Jesuit Monastery”, former Apostolic School (1922-2022), whose facilities are currently also used as a retirement home and for the production of one of the most traditional coffees in the region (Sebrae, 2017).

One of the most recent achievements was the implementation of the I Ceará Shaded Coffee Reference Center (CRCS), inaugurated in 2022, which is part of the macroproject of agricultural production associated with tourism, called “Baturité, land of coffee” (GMB, 2022). It is also worth mentioning that international tourism will be contemplated with the construction of the International shaded coffee Center, which is in progress, where there will be: Coffee Memorial, bean processing, expansion of the tourist route and incentives for the expansion of the production chain (Rodrigues, 2020).

In this same sense, aiming to promote the coffee activity in the Baturité mountains as a historical, cultural, social, and economic heritage in Ceará, the Secretariat for Economic Development and Labor (SEDET) has been implementing actions to obtain the Geographical Indication seal (Ceará, 2020), an important registration that attests to the product’s origin and its special manufacturing conditions, giving it a reputation, its own identity, and greater intrinsic value, besides serving as a differential in relation to similar products on the market.

## METHODOLOGY

In the line of a case study, the research is classified, as to the objectives, as exploratory and descriptive; as to the nature and technique of data analysis, as qualitative. The methodological procedure adopted contemplates bibliographic and/or documental study; observation and participant research; semi-structured interviews directed to key sources in the municipality of Baturité, in the urban area and in the rural communities of Olho d'Água and Uirapuru, in the period from January to December 2022.

The research on theoretical material, initial step in the effective construction of the investigative process, was based on the dialogue with Cavalcante (2005), Oliveira (2016), Amorim, Assis (2021), Berlatto (2021), Queiroga (2021), among others. To form the empirical body of research, we considered as key sources social actors with diversified profiles (men and women in different age groups) with relevant experiences and knowledge about the topic under study, among them: three family coffee growers, three rural entrepreneurs, three traders, three tourists and/or hikers, three people with renowned historical knowledge and five institutional representatives/leaders, public and private, linked to coffee production in the region (Table 1), resulting in a sample composed of 20 participants.

**Table 1: Institutions related to coffee culture in Baturité-CE**

Institution of action	Institution/Body/Private entity
Municipal	Municipal Government of Baturité - GMB
	Rural Development Secretariat of Baturité - SDRB
State	Technical Assistance and Rural Extension Company of Ceará - Ematerce
Federal	Brazilian Institute of Geography and Statistics - IBGE
	Brazilian Service of Support to Micro and Small Enterprises - Sebrae

Source: Prepared by the authors, 2023.

The observations and interlocutions were made in person, in loco, having Baturité (urban and rural highland areas) as a geographic cutout. The interview analysis was based on the thematic-categorical content analysis technique of Bardin (2016), where quantitative indicators or not, present in the variables inferred from the messages, go through the phase of organization, pre-analysis, classification and formulation of hypotheses for the development of indicators of the results. The interviews followed the criteria of saturation of the collected data, when the information started to repeat (Glaser & Strauss, 2006).

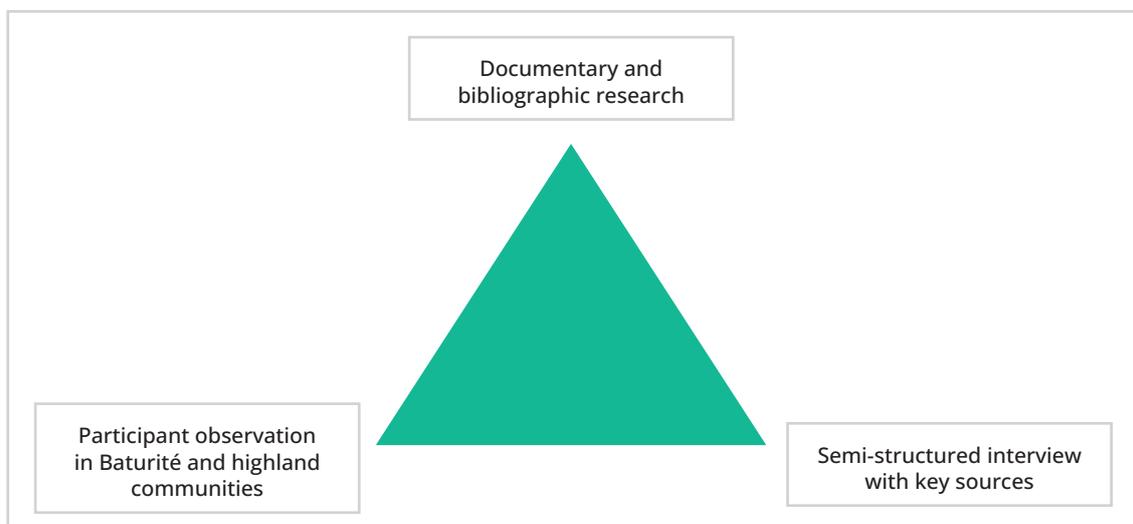
In order to identify the perceptions (convergent and divergent points) of different social players that make up the complex web surrounding ecotourism in the Baturité mountains, considering the impact of the revitalization of the shaded coffee culture in the region (from initiatives focused on tourism, environmental preservation and regional socioeconomic development), we chose to contemplate key sources: representative of the GMB, SDRB, Ematerce, IBGE and Sebrae; producers of coffee seedlings; native coffee growers; coffee grower and community leader; retired teacher, rural

entrepreneur who follows her family's coffee tradition; tourist and/or hiker present at the "Rota Verde do Café"; among others.

To protect the identity of the participants, we used the name interviewee, followed by a numerical sequence. The content of the interviews was recorded and/or registered in a field diary, transcribed, and catalogued by approach topics. Among the main topics addressed were: coffee as a vector of socioeconomic development and environmental preservation; rural entrepreneurship and the tourist offer associated with coffee production; the relationship between the revitalization of shaded coffee and tourism; the circular economy and sustainable environmental management in the region; the rational use of natural resources, aiming at socio-environmental sustainability; and the eco-socioeconomic impacts of coffee production in the region.

The interviewees were informed about the possible benefits and risks of the information given, the absence of costs, the guarantee of anonymity, and the freedom to not contribute/participate in the interview by signing the Informed Consent Form (ICF).

**Figure 1: Triangulation between research methods**



Source: Prepared by the authors, 2023.

The use of different types of information collection instruments enabled the triangulation of data, confrontation of information, (Figure 1), a process that allows for more convincing and relevant conclusions (Coutinho, 2011).

## RESULTS AND DICUSSIONS

Circular economy and social entrepreneurship: the implementation of the I Reference Center of the Shaded Coffee of Ceará

The bicentennial of the coffee production in the Baturité Mountain Range was commemorated on April 14th, “World Coffee Day” and “Day of the Historical Memory of Baturité”, with the implementation of the 1st Coffee Reference Center of Sombra do Ceará - CRCSC; the launching of a commemorative stamp to the 200 years of coffee presence in the region and the unveiling of the plaque “Baturité, Coffee Land”. The actions are an initiative of the Baturité Municipal Government (GMB), the Brazilian Micro and Small Business Support Service (Sebrae) and the União Serrana do Uirapuru Community Association - ACUSU.

The CRCSC (Figure 2) is a municipal space open to visitation, located at CE 356, in the Uirapuru community, approximately 10 km from the Baturité headquarters. The administration is done in a communitarian way by the “guardians of Uirapuru”, collaborators who participated in the Sebrae/ Baturité training to support the coffee growers and contribute to sustainable tourism and socio-economic development of the region. Another important partner in this area is Ematerce, which contributes with actions aimed at supporting productive technologies.

**Figure 2: Ceará Shaded Coffee Reference Center (CRCSC), Baturité, Ceará:  
A - CRCSC building and B - 200 years of coffee stamp in Baturité**



Source: Authors, 2022.

At the site, tourists learn about the process of resurgence of the production of a coffee from the typical variety of the Arabica species, the environmental benefits, the stages of roasting the bean: the physical and chemical processes that impact the flavor, acidity, aroma and body (Farias & Farias, 2022; GMB, 2022). On the occasion, the tourist is also informed about the relevance of the regional coffee culture (as historical, cultural, scientific, and socioeconomic heritage) and the actions to obtain the seal of geographical indication for the region’s coffee (SEDET, 2020; GMB, 2022). The Secretariat of Economic Development and Labor (SEDET), through the Executive Secretariat of Agribusiness (SAN), established the action plan called “The Restructuring and Value Aggregation of Coffee Production in the Maciço do Baturité”, which aims to identify the potential of coffee production in the Maciço do Baturité region in order to obtain the geographical indication stamp.

The “Sou daqui” coffee shop is also on site, displaying regional foods made by the region’s inhabitants. The space is a kind of “showcase” of highland products, where one can find coffee, sweets, handicrafts, coffee seedlings, coffee-based drinks (liquor and beer), among others.

The participant observations and interviews carried out with key sources in Baturité, the urban area and in the rural highland communities of Olho d'Água and Uirapuru (individuals with notorious knowledge about the historical and socio-environmental context of the region, coffee growers, rural entrepreneurs, tourists and/or hikers, public administrators, and representatives of institutions related to coffee growing) made it possible to survey the strengths and weaknesses related to the implementation of the CRCSC in the regional development environment (Table 2).

**Table 2: Analysis of the socio-economic and environmental dimensions of the CRCSC**

Strengths	Weaknesses
-Qualification of coffee growers.	-Need to expand the physical space.
-Community coffee roaster.	-Low inventory of products for sale.
-Family farm labor force.	-Demand for use of the toaster.
-Sale of coffee, coffee seedlings and regional products.	-Competition with industrialized products.
-Circular economy.	-Not enough people to attend the tourist group.
-Good location.	-Cafeteria with space for small public.
-Project "Heritage and Environmental Education.	-Parking limitations.
-Coffee shop with natural foods and mountain coffees.	-Small scale food production.

Source: Prepared by the authors, 2023.

In view of the above, considering tourism as a practice that includes subjects from different socio-cultural and economic realities, we chose to bring some reports of the interviewees about issues related to coffee tourism in the Baturité mountains, in the light of the implementation of the CRCSC, considering aspects interconnected with the economic, social and environmental sustainability of the region.

The municipal manager of Baturité (Interviewee 1) reported that "CRCSC is a social tool to qualify shaded coffee family producers and insert the circular economy culture, which involves economic and sustainable growth". For her part, the representative of Sebrae/Baturité (Interviewee 2) stated that "the CRCSC is a space to promote meetings with family producers, community and tourists [...] work on heritage and environmental education, promote food production workshops, do environmental blitz and talk about coffee".

A coffee seedling producer and rural family entrepreneur (Interviewee 3) highlighted that "we already had tourism here, but people looked more for the waterfalls... today, with CRCSC and the "Coffee Land" sign, people want to know our history [...] we are small, a small producer, but we think big, we want to expand production and sell more coffee".

Regarding the actions focused on qualification and social entrepreneurship, the coffee grower and community leader (Interviewee 4), who has lived in the region for four decades, emphasized that "the qualification was already happening with the agronomists (Sebrae and the Baturité City Hall), but with the "coffee house" (CRCSC) it got better, because there is a toaster. Here in the region there are twelve coffee farms, there are people with more and people with less, but they all have coffee.

Regarding the physical space of CRCSC, a CRCSC employee describes that (Interviewee 5) “our space has limitations, it is small, but in four months of implementation we can already see that there are more people visiting our community, before we only saw people going to the waterfalls... today there are more people and more money circulating in our locality”.

A tourist from the southeast who was visiting the CRCSC made the following comment (Interviewee 6) “the space is small and parking is limited, but it is a welcoming environment, this is the difference! The coffee brewed here has the taste of affective memory, the smell of the coffee roasting is impregnated in the clothes and in the memory”.

Experience tourism was contemplated in the speech of a tourist from Ceará, leader of an excursionist group (Interviewee 7), who made the following explanation: “I live in Fortaleza, but I am from the countryside. I didn’t know about the Baturité mountains, or the history of coffee. Walking through the woods, seeing the coffee roasting process, drinking coffee with corn cake is like going back to the past. I plan to come back and bring my children and grandchildren.

A SDRB employee (Interviewee 8), historian and coffee expert from Baturité, pointed out that “most tourists coming from Fortaleza go through CE 356, many did not stop [...] did not even know there was coffee, now they stop, drink coffee, buy coffee, get to know the producing sites [...] this generates jobs, income and makes the rural man more valued”.

Regarding the revitalization of shaded coffee, the native highland coffee grower (Interviewee 9), reported that “we are getting coffee seedlings at the coffee house (CRCSC) and planting, but you know that there are trees over a hundred years old and still putting coffee, [...] many people who pass through the mountains only see banana trees and jackfruit trees, they don’t see coffee trees, they are there in the woods and in the yards of the houses.”

The retired farmer and teacher (Interviewee 10), who is part of the third generation of a family of coffee producers, described that “coffee is a tradition, it is part of our culture [...], here the rich and the poor have coffee. In the CRCSC we have organic coffee (in reference to Café Santa Terezinha), which is the most famous, it has a seal and everything, but there’s the farmyard coffee, there’s room for everyone.”

The forest-agriculture binomial is internalized in the socio-historical-cultural context of the “know-how” of the rural family producer in the highlands, who has made each coffee unique, special, that does not harm nature or human beings. The interviewees were unanimous in affirming that they do not use chemicals, emphasizing that “nature is a partner in the production process, we take care of nature and nature takes care of us. From this perspective, highland coffee farming is antagonistic to the predominant monoculture production in Brazil, which uses synthetic fertilizers, pesticides and/or pesticides, which harm the environment (Queiroga, 2021).

The data collected empirically were confronted with the perceptions in participant observations, in documentary and bibliographic research, and through the experience of one of the authors who lives in the region and has been researching coffee for a decade.

### Shaded coffee and tourism: sustainable social management and economic development

Today, the panorama of coffee production in the Baturité mountain range includes different productive areas (Table 1) that have in common the respect for the environmental laws in force; the sustainable management of the productive systems; the planting of Arabica coffee; the use of the associated biodiversity (plants, animals, and microorganisms) in the process, which propitiates a long-term sustainable agriculture, the consortium of agricultural and forest crops, and the family-based production system.

**Table 1: Coffee production, beans, temporary crop, in the municipalities of Mulungu, Pacoti, Guaramiranga, Aratuba, Palmácia and Baturité, 2021**

City	Quantity produced (t)	Production value (x1000) R\$	Area destined for harvest ha	Harvested area ha	Average Yield kg/ha
Mulungu	170	944,00	600	600	283
Guaramiranga	44	282,00	120	120	326
Pacoti	12	70,00	30	30	400
Aratuba	9	63,00	28	28	321
Baturité	3	18,00	10	10	300
Palmácia	-	-	-	-	-

Source: IBGE, 2021.

As shown above, Mulungu is the highland city with the largest production area, but is the last in average yield per Kg/ha; Guaramiranga, despite being the second smallest municipality in Ceará (IBGE, 2022), stands out as the second largest producer and for having the second highest average yield per Kg/ha; Pacoti, which has the highest average yield per Kg/ha, and Aratuba have similar production areas. Baturité, even though it has the smallest area destined to coffee plantation, has a higher average yield kg/ha than the largest producing city, Mulungu.

The data reveal that the highland shaded coffee plantation, in the agroforestry system, is not regular, differing from the linearity of the plantation in the monoculture system, considering the square meter (m<sup>2</sup>) as a parameter. Thus, regarding the productive area, there are potentials and limitations that are related to the geo-environmental conditions of the region, such as: relief, climate and/or microclimate, vegetation, soil quality, influence of ecological interactions, shading, and forest management techniques.

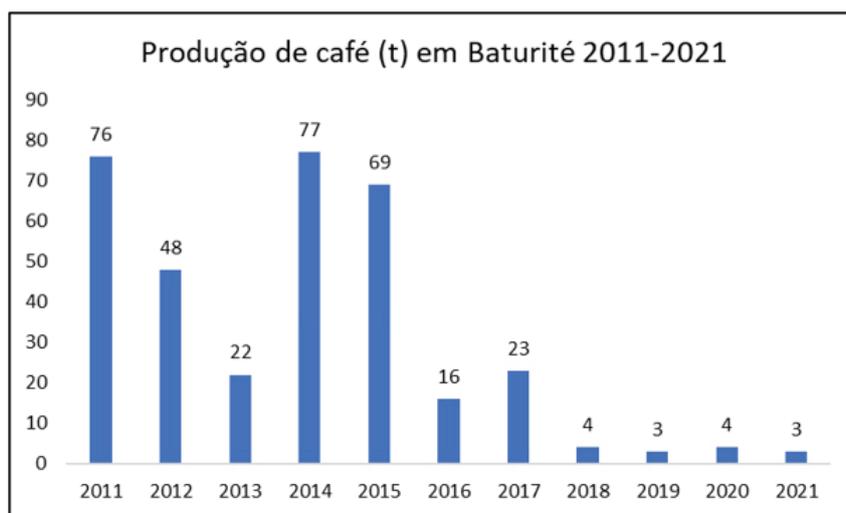
The municipality of Baturité has an urban core located in the foothills and a territorial area that encompasses sertão (40%) and serra (60%), where the caatinga and humid forest biomes predominate, in the highland rural area (GMB, 2022; Ceará, 2014). Thus, the production of shaded coffee,

which is limited to the highland rural area, has favorable geological and climatic conditions for coffee production, where the shade of the coffee trees occurs by the native forest and by the highland relief itself, which is marked by steep slopes and gradients.

As for the municipality of Palmácia, it has not reached the unit of measurement (t) needed to be catalogued by the Brazilian Institute of Geography and Statistics (IBGE, 2021). In that region coffee gave way to banana cultivars (*Musa spp*).

According to the historical context, with the end of the coffee cycle in Brazil in 1930, many highland coffee growers abandoned and/or exterminated the coffee trees and invested in other sources of income, such as fruit, horticulture, floriculture, and grains (Amorim & Assis, 2021; Girão, 2000). The loss of economic potential culminated in a sharp drop in coffee production in Baturité (Graph 1), which contributed to the small rural producer in the highlands diversifying his rural territory.

**Graph 1: Quantity of coffee (beans) produced, 2011-2021, in Baturité, Ceará**



Source: Prepared by the authors, IBGE data, 2021.

In the current context, the agricultural crop that stood out most in the region of the Baturité mountain range was banana cultivation (Table 2), “the most consumed fresh fruit in the world” (EMBRAPA, 2020, p. 1). According to data from Ematerce (2019), in the Baturité mountain range there are about 1,200 banana producers, with 400 in Palmácia and the others scattered throughout Baturité (CE), Guaramiranga (CE), and Pacoti, with an average productivity of 3 to 4 thousand kilograms per hectare/year. In the municipality of Baturité (Table 2), agricultural production, both in the highlands and in the hinterland area, has in fruit farming a relevant segment for the local economy (GMB, 2022).

**Table 2: Agricultural production, permanent crops, in Baturité in 2021**

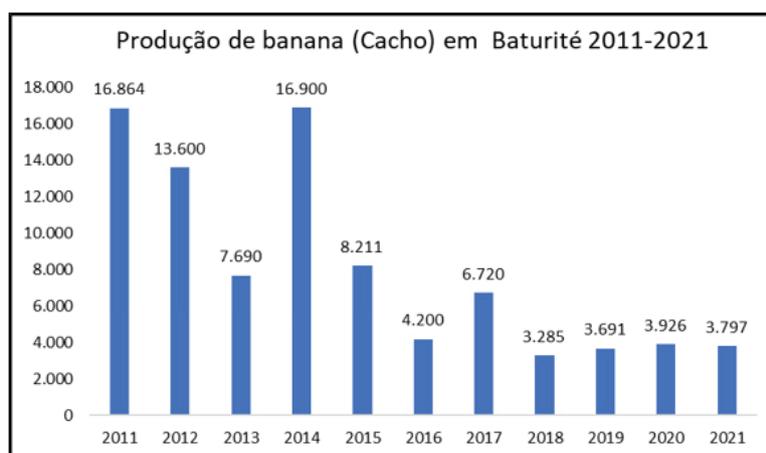
Product	Quantity produced (t)	Production value (x1000) R\$	Area destined for harvest ha	Harvested area ha	Average Yield kg/ha
Banana (bunch)	3.797	2.527,00	731	731	5.194
Mango	791	874,00	76	76	10,408
Cashew nut	22	42,00	120	120	183
Coffee (bean)	3	18,00	10	10	300

Source: IBGE, 2021.

The coffee fruit, despite having less representation, in terms of quantity produced, is the most valued agricultural product and the one that provides the highest financial return for the rural producer in the highlands. According to the highland farmers' reports, the value of a thousand units of banana varies between R\$ 60 and R\$ 120, and a bag of coffee (60 kg) is sold for between R\$ 1,200.00 and R\$ 1,500.00.

The small rural producer in the highlands, over the past few years, is investing less in banana production (Graphic 2) and diversifying its agricultural space, with emphasis on the production and/or revitalization of shaded coffee, which has been consolidating as the product with the highest commercial value. In Baturité, the actions are linked to the macro-project of agricultural production associated with tourism called "Baturité, Land of Coffee", a partnership between the Baturité City Hall and Sebrae, Ceará (GMB, 2022; Sebrae, 2023).

**Graph 2: Quantity of banana (bunch) produced, 2011-2021, in Baturité, Ceará**



Source: Prepared by the authors, IBGE data, 2021.

Based on the information above, it is evident that rescuing the productive potential of shaded coffee is interconnected with regional public policies aimed at valuing the “know-how” of the mountain producer associated with the insertion of modern techniques, aimed at a sustainable productive activity, and the potential of rural tourism. Tourism is part of the tertiary sector of the economy and covers formal and informal activities associated with trade and services (Ceará, 2016).

Tourism, in the mountains of Baturité, has become the non-agricultural activity with greater socioeconomic representativeness for the region. The revitalization of coffee farming and the implementation of tourism routes around the localities and/or coffee producing sites has been contributing to insert, expand and solidify the “coffee tourism”. Tourism in the mountains of Baturité grew around the climate, landscape, proximity and good access conditions facilitated by good road conditions (Ceará, 2014).

### **The impact of the Coronavirus (COVID-19) on the economy and “Circula Baturité**

The World Health Organization (WHO), on December 31, 2019, was alerted to cases of pneumonia in Wuhan City, Hubei Province, People’s Republic of China, caused by the SARS-CoV-2 or New Coronavirus - COVID-19 (UN, 2019). On January 30, 2020, the organization declares “Public Health Emergency of International Importance - ESPII,” the organization’s highest level of alert, with a pandemic emerging unprecedented in history.

Considering this new reality, the epidemiological impact brought an economic and social crisis, and the negative results for the economy had repercussions all over the country, a fact not different in the highland region of Baturité. The post-pandemic economic recovery, starting from the advent of the vaccines against COVID-19 and the relaxation of social isolation measures, allowed a new look to the most affected sectors, the so-called “non-essential”, among them tourism (Brasileiro *et al.*, 2022). According to Magno (2022), tourism in Brazil is still marked by intense impacts from the Covid-19 pandemic, when there was a 10.05% reduction in the flow of travel in the country. Today Ceará is the eighth most popular destination in the national context.

The adoption of measures to strengthen the economy in Baturité and Serrania, based on the potential of local tourism associated with the singularities of the shaded coffee, counted on strategies directed to the event “Circula Baturité” held at the CRCSC (GMB, 2022). The project focuses on the creative economy (which uses creativity as the highlight for product creation) and the transformation of the linear economy into a circular one, which associates economic development with the conscious use of natural resources. Among the activities that are being carried out from “Circula Baturité”, tourism can be highlighted.

According to the municipal manager of Baturité, “tourism is a source of economic recovery after the pandemic, because we have all the ambiance to explore this activity through historic buildings, churches, waterfalls, environment, and the internationally known coffee”.

The actions focused on gastronomic tourism are boosting the production of regional foods, and coffee plays an important role in several compositions, such as: coffee liqueur, coffee candy, coffee cake, coffee pie, and the traditional banana and coffee candies, which are handmade by rural entrepreneurs from the highlands, who started to complement the family income with the sale of these delicacies. It is worth mentioning the relevance of the gourmet workshops, based on coffee-based products, held at Sitio Carmelo, in the rural highland area of Baturité, which is part of the Uirapuru Circuit. These events are aimed at the highland community and at food entrepreneurs.

The Uirapuru Circuit, a branch of the RVC, includes the rural highland area of Baturité, composed of the communities of Olho d'Água and Uirapuru, where there are visits to coffee producing locations, the Jesuit Monastery, and several waterfalls and trails. Some of these trails pass by rural producers' houses, where coffee can be bought directly from the source.

The cultural shows that take place on weekends are also an attraction for tourists and for the highland community, who have the opportunity to get to know and appreciate the talents of the land, valuing our cultural roots through music, dance, and theatrical sketches (short scenes), events that revive the golden times of the coffee culture in the region. Another action that is moving the region is the ecological blitz, where tourists are made aware of the need to preserve the mountain biome, like the "D Day for Cleaning the Baturité Waterfalls". As part of the training of young women in the region, workshops on sustainable practices and environmental education are taking place with coffee grounds and oil used in kitchens and restaurants in the highland region.

In the sphere of regional environmental education, regarding students from the state and municipal public schools of Baturité, there is the project "Tem Café na Escola", which is part of the Heritage Education project, whose execution includes field visits, ecological trail, recycling workshops and storytelling about the origin of coffee farming in Baturité's territory. In September 2022, the book "A Viagem do Café pelo Mundo" was launched, aimed at children, whose content deals with the history of the most popular beverage in the world. Among the themes addressed is the revitalization of the shaded coffee in the Serra do Maciço de Baturité (Trendsce, 2022).

The handicraft, a tradition in the region, includes art with banana straw, hat made with carnauba straw, crochet, embroidery, knitting, macramê, paintings, wood and iron sculptures, fuxico (assembled with fabric flaps) and pieces made with recycled material, which are sold in several tourist spots, in natural and handicraft products fairs, at the artisans' homes and through social media, a scenario that has been helping to rescue traditions and provide more income for families. In a process of expansion, many artisans are already making their art available in virtual environments. In the context of the media field, the "Portal Destino Serra: Business and Tourism in the mountains of Baturité-CE" (<https://linktr.ee/destinoserra>) stands out for publicizing the tourist potential of the cities in the mountains of the Massif of Baturité and the activities added to its surroundings.

Given the relevance of the region's tourism, in 2022 Baturité was inserted in the Brazilian Tourism Map, in the category C, destined to municipalities that register a national and international tourist flow. The Map is an instrument linked to the Tourism Regionalization Program, which defines the area and/or territorial cutout to be worked on by the Ministry of Tourism in the development of public policies (Brazil, 2022). It is worth mentioning that Ceará, due to its strategic geographical location, is considered the Northeast's gateway to international tourism, especially to Italy, Portugal, France, Spain, United States, Switzerland, Holland, and Germany (Ceará, 2020).

In the scope of international tourism, in 2020, actions were started in order to implement the International Center of the Café de Sombra (CICS) in the mountains of Baturité, based in Mulungu. The action, which involves partner institutions (local municipalities, Sebrae, and coffee growers), aims to consolidate the region as a destination for national agrotourism, including production, research, and marketing of shaded coffee (Rodrigues, 2020).

## FINAL CONSIDERATIONS

In view of the above, based on the analyses carried out in the research, it was found that the shaded coffee of the Serra de Baturité (100% Arabica and produced by small farmers in a biodiverse agroforestry system) has become a vector of opportunity for sustainable development in the region, both in economic and socio-environmental aspects. Although shaded coffee has lower productivity compared to full sun plantation, the rural producer gains in bean quality and in relation to the added value, which makes it possible to meet the demand of a consumer increasingly attentive to the origin of the products, their characteristics, and their environmental impact.

The empirical information collected and later analyzed in the light of the literature reviewed shows that the coffee tradition, associated with tourism (coffee tourism), has been leading changes in the production scenario, in regional entrepreneurship, and in the man-nature relationship, from actions focused on the creative and circular economy, where there is the valorization of the region's cultural capital, which is present in coffee farming, in the production of food and/or natural and/or handcrafted products, with traditional characteristics and made on a small scale.

The Shaded coffee culture is contributing to expand the tourist modalities (adventure, rural, gastronomy, events, cultural, and ecotourism) in the Baturité mountains, which allows to contemplate the heterogeneity of the public that frequents the region. Although the actions to expand/revitalize the coffee production in Baturité are in their initial phase, it is already noticeable that the demand for the product has been growing and is boosting the local economy, generating a mutually beneficial relationship: coffee-tourism helped to give visibility to the coffee production and the product, in turn, stimulated local tourism.

The results obtained in the present research aim to contribute to the historical-cultural, socioeconomic, environmental and academic-scientific aspects. In the historical-cultural scope, the study provides reflections about the actions directed to the bicentennial of the implantation of coffee in Serra de Baturité for the valorization of the intangible cultural assets of the region. The socioeconomic perspective collaborates with future actions (public and private) directed towards tourism development supported by the coffee culture, considering rural entrepreneurship, coffee revitalization, and circular economy. On the environmental side, the research brings a broader view about the impact of tourism associated with the production of shade-grown coffee in the Baturité Mountains, reflecting a harmonious relationship between man and nature, focusing on the sustainable management of natural resources. Regarding the academic-scientific relevance, the study favors future researches about the effects of the revitalization of the shaded coffee culture in Baturité mountain range, from initiatives directed to tourism, environmental preservation and regional socioeconomic development.

In view of the above, and considering that this is a theme that has been little explored in the academic context, some provocations for future research have been raised: What is the impact of the socio-environmental and economic sustainability of the actions aimed at coffee tourism in the Baturité mountain range in the long term?

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## AUTHORS' CONTRIBUTION

**Sofia Regina Paiva Ribeiro:** Conceptualization, methodology, data collection, writing and review.

**Filipe Augusto Xavier Lima:** Literature review, data treatment and writing.

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