

## International Coffee Trade: a literature review

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### ABSTRACT

In terms of the volume of coffee is the second largest commodity traded in international trade and one of the most valuable globally traded agricultural commodities in human history. In addition, coffee is one of the most widely consumed beverages globally. In this way, it has a significant impact on millions of people worldwide, from farmers to consumers. The results show that the global coffee trade has grown steadily since 2000. In addition, the number of scientific publications in coffee is also growing exponentially. This article aims to collect and process the literature related to coffee. One of the essential scientific bibliographic databases, Scopus, was chosen and belonged to Elsevier. It contains more than 80 million records. This is one of the central archives in the literature that uses peer review to validate the research. A review of the literature revealed that there are few publications on the global coffee trade. Three historical stages of the coffee trade are identified and analyzed in the post-World War II period. The most important topics of these periods are dissected by the authors: fairtrade, coffee sustainability, coffee value chain, and various forms of regulation.

## 1. Introduction

Coffee has been consumed for more than 1,000 years and is today the most consumed beverage in the world (Davis et al. 2019; Mussatto et al. 2011). The world's population consumes more than 2.4 billion cups of coffee a day. Coffee is one of the most sought-after agricultural ingredients in the world. Although coffee has been praised for its aroma, taste, likely, its caffeine content has also played a role in increasing its popularity (Higdon & Frei 2006). Coffee production and trade connect some of the world's poor rural areas to global markets (Valkila et al. 2010). In this way, it has a significant impact on millions of people worldwide, from farmers to consumers. It is crucial to the economies and policies of many developing countries, as its cultivation, processing, trade, transport, and distribution create jobs. More than 70% of global coffee production is by smallholders who farm less than ten acres (Jezeer et al. 2019). About 70 countries produce coffee. In recent years alone, three countries have produced about 55% of the world's coffee: Brazil (32%–34%), Vietnam (12%–13%), and Colombia (8-9%) (Kumar et al., 2006). Today, they are the most critical coffee-producing countries (Zamir, 2014). The truth is that many developing countries are dependent on few agricultural commodities and, as a result, they are susceptible to crises in international markets. Of these goods, several "cash crop" products are sold for profit. One such product is coffee itself (Pokorna & Smutka 2010). The United Nations Conference on Trade and Development (UNCTAD) estimates that 57 developing countries depend on three or fewer commodities to generate more than half of their export earnings (Raju & Melo 2003). Coffee is an essential commodity in the global economy, accounting for approximately \$ 31.7 billion in trade in the calendar year 2018, representing about 146.5 million pieces of 60kg bags (8.8 billion tons). Coffee exports have been growing steadily since 2000 (ITC 2011; Khamitova et al. 2020). In the global market, the price of coffee beans has fallen in the last few years. Such a fall in prices puts economic pressure on landowners in coffee-producing countries. For example, the selling price of many small coffee growers is lower than the cost of production, forcing them into poverty and debt. As a result, more and more farmers have stopped growing coffee (Hira & Ferrie 2006; Joo et al. 2010; Pancsira & Lengyel 2020)

The analysis of the determinants of bilateral trade has been the subject of much research in the past. Many studies that analyze the determinants of trade flows generally use the gravity model. However,

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Anderson and Wincoop (2004) and Nguyen (2020) state that analyses with disaggregated trade data are also plausible and necessary because there are significant sectoral differences in trade turnover and costs. Sectoral or more broken down trade in goods can be important for several reasons. First, it may be important whether specific sectors are growth drivers. Second, the factors limiting growth are easier to identify at the sectoral level. Third, several policies are formulated for products not identified among the relatively aggregated sectors (Abafita & Tadesse, 2021). In recent years, global coffee trade studies have examined Fair Trade (Fairtrade International, 2020), sustainable coffee production, and smaller coffee plants. At the same time, Torok, Mizik, and Jámor (Torok et al., 2018) analyze Indonesia (Ibrahim & Zailani 2010), Ethiopia (Boansi et al. 2013), and Cameroon (Molua 2008) in terms of competitiveness.

## 2. Materials and Methods

There are currently some data sources in the scientific literature (Google Scholar, PubMed, Scopus, Web of Science) whose research areas have different approaches. One of the essential scientific bibliographic databases, Scopus, was chosen and belonged to Elsevier. It contains more than 80 million records and this is one of the leading archives in the literature. They use peer review to validate the research. Scopus has a simple interface and helps display data through software such as VOSviewer (Lengyel et al. 2021). The goal is to explore factors that influence the coffee trade. In the course of data collection, I look for the combined occurrence of the words "coffee" and "trade" and "coffee" and "market" in the title, abstract, and keywords of the published literature. Respectively, The examined documents were published between 1979 and 2022. The search was performed with the following term:

TITLE-ABS-KEY (coffee AND (trade OR market)) AND PUBYEAR > 1979 AND PUBYEAR < 2022

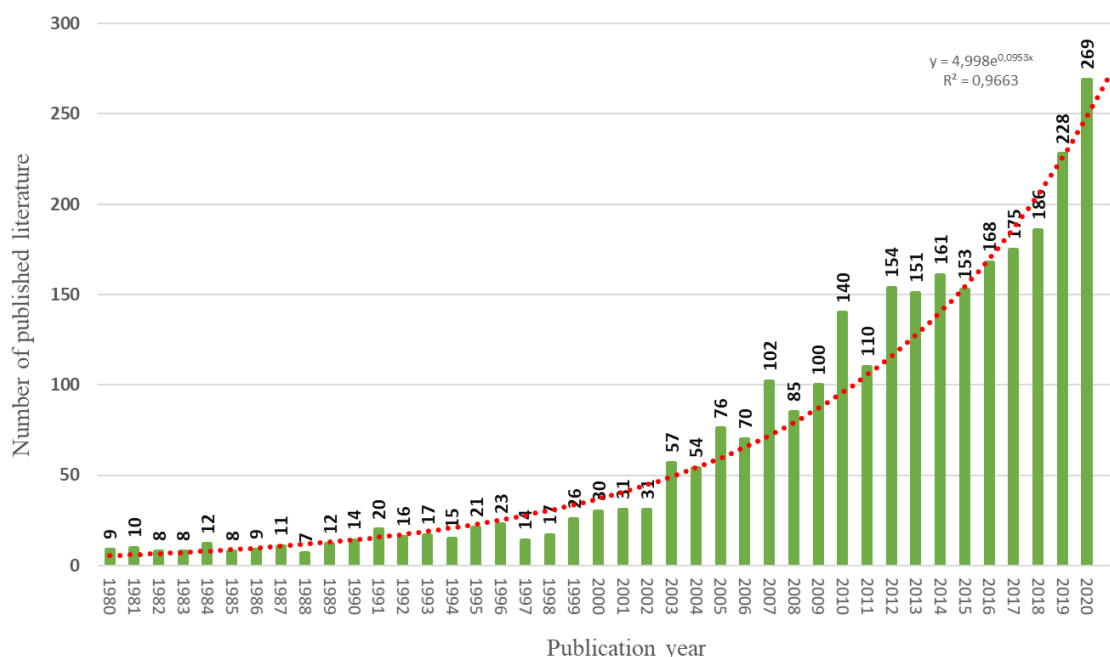
The base sample includes 3.057 documents (of which 225 are articles, 274 book chapters, 185 reviews, 52 books, 259 conference proceedings, and 62 other documents) published on this topic by the end of 2021.

Document metadata has been exported from Scopus to a .csv file. The VOSviewer bibliometric tool was used to analyze co-occurrences. It is a user-friendly tool that allows bibliometric data to be processed directly from the Scopus database and is ideal for displaying them over networks (van Eck & Waltman 2010)

## 3. Results

During the study, I created a diagram showing the annual representation of the publications sought by Scopus (Figure 1). From 1980 to 1990 only a few documents were published on the subject. The graph illustrates that the number of papers has doubled since the 1990s. Many fundamental changes have taken place in the 1990s since the liberalization of commodity marketing systems in developing countries began. The trend towards more widespread free trade accelerated after the end of the Cold War, and even more so in the case of the coffee industry, with the end of the price-stabilizing economic clauses in the International Coffee Agreements (ICAs). Respectively, globalization has taken on a new meaning during this period. There is a significant increase in the number of publications that have been observed since 2003.

One reason for this is that, the world price of coffee reached a 100-year low in 2002, so professionals paid more attention to coffee. In 2001, the first world coffee conference was held. The conference looked at how the shortcomings of the current structure could be filled. It also sought to answer the question: what changes are needed in production, trade and logistics to bring manufacturing and marketing in line with demand? It is also concluded that radical changes in the thinking about the global coffee structure and the policies of producing countries are needed to rationalize global supply and consumer demand, both in terms of quantity and quality. The following significant change in the number of publications was in 2007. The Second World Conference may have influenced attention to the topic, the full report published in 2006. His main topic was "Lessons from the Crisis: New Ways for the Coffee Sector". Several high-level speakers spoke from market economy coffee policy to building a sustainable coffee economy.



**Figure 1.** Number of articles (1980-2020)

Another reason is that coffee prices have been rising steadily since 2004, reaching the level of 1998, bringing the export revenue of producing countries to \$ 15.2 billion in the 2007/08 coffee year, a record high. Although prices returned to market levels during market regulation, many producers did not fully benefit from this increase due to factors outside the coffee market, the most important of which were exchange rate movements, rising costs, and labor shortages. Nor can we ignore the fact that the effects of the great global crisis have been felt in the number of documents published in 2008. Overall, as shown by the fit curve  $R^2 = 0.9663$  in Figure 1, the number of scientific publications in the field of coffee increased exponentially during the study period.

The total number of keywords that occurred in the sample was 6.594. Table 1 shows the top 15 keywords that appear in the articles. It shows the number of connections for those keywords and how many other keywords are in that publication. This value indicates the importance of the keyword; the higher the value, the more relationships it has. While the occurrence shows how many documents the keyword was included.

**Table 1.** The number of occurrences of the keyword in the total sample.

Keywords	All connections	Incidences
<i>coffee</i>	630	463
<i>fair trade</i>	272	138
<i>certification</i>	170	79
<i>sustainability</i>	114	62
<i>caffeine</i>	42	46
<i>agroforestry</i>	57	42
<i>coffee arabica</i>	30	38
<i>ethiopia</i>	57	38
<i>mexico</i>	79	37
<i>trade</i>	60	35
<i>agriculture</i>	65	34
<i>brazil</i>	37	34
<i>quality</i>	48	33
<i>cooperatives</i>	79	32
<i>biodiversity</i>	59	31



From the keywords in Cluster 1, it can be concluded that one and perhaps the most crucial topic in the coffee trade is the "fairtrade" trade. Many publications analyze fair trade. In addition, the issue of the various cooperation arrangements for the coffee trade is essential. Table 2 gives a good indication of the countries in which the coffee trade plays an important role. Mexico, Brazil, and Colombia are obviously among the essential coffee-producing countries. It can also be stated that the keywords that appear in this cluster, or the exact keywords, appear in publications that deal with the coffee trade. The terms appearing in Cluster 2 and related studies examine the physical and chemical effects, especially with the types and quality of coffee. It also analyzes the advantages, disadvantages, and effects of coffee consumption on the human body. Scientific papers on sustainability regulation and analysis of different certifications occur in Cluster 3. Of course, fair trade also plays a vital role in these publications. While for Cluster 4, the key terms in the communications on coffee agroforestry systems, biodiversity, and climate change appear. It can be stated that the themes related to all four clusters play a capital role in the international coffee trade.

I continued to review the literature to get a more accurate picture of the international coffee trade. I further narrowed the list of publications based on the results already achieved. Thus, I used the most vital keywords in the literature processing: fair trade, certification, and sustainability.

The number of documents published in this way was 388. This list included my topic of scientific publications that were not closely related to commerce. To name just a few: coffee consumption during pregnancy, the effects of caffeine on the human body, a review of the risks and phytochemistry of caffeine consumption, physical and chemical properties of defective raw and roasted coffee beans, or even near-infrared spectroscopy for analysis of caffeine, theobromine, and theophylline in coffee. For this reason, only articles specifically related to my topic were retained. Thus, the following issues remained in the screening: Social Sciences; Economics; Environmental Science; Agricultural and Biological Sciences; Arts and Humanities. Thus, after the narrowing down, 183 publications remained, of which, after an abstract reading, I selected the publications that can be closely related to my topic. So I rely on the top 10 publications to better understand the coffee trade. In the following, I summarize the findings of the mainstream literature on coffee. I present the global value chain of coffee, regulatory systems, and the two stages of sustainability.

### **3.1. The global value chain of coffee**

Encouraged by factors and the globalization of labor markets, companies are constantly transforming their production systems and expanding into new consumer markets. In recent years, there has been a period of consolidation among the big coffee roasters, which analysts call a "sudden shift" in the world of coffee. At the same time, new markets are emerging, some industry organizations are disbanding, while others are emerging, new trends in good quality coffee are emerging, and NGO involvement strategies are shifting from opposition to working with large multinationals (Grabs 2020; Grabs & Ponte 2019). Until recently, the basic geography of coffee production and trade was mainly in line with earlier colonial patterns. Coffee was grown almost entirely in less developed regions of the tropical global southern region. An estimated five countries (Brazil, Vietnam, Colombia, Indonesia, and Ethiopia) accounted for 69 percent of global production in 2016. At the same time, the European Union and the United States were responsible for 67 percent of all imports (*FAOSTAT* n.d.). Talbot's analysis of the distribution of total income and surplus within the coffee chain has identified a fundamental feature of the chain: producing countries absorb very little of the total value added of the chain, and their ability to do so has deteriorated over time (Neilson & Wang, 2019; Talbot, 1997).

Among the consuming countries, the Scandinavian countries (which have the highest per capita consumption in the world) and Germany prefer arabica coffees. Robusta coffee is a crucial ingredient in espresso blends and darker roasts and is vital in southern Europe. The U.S. and U.K. markets generally prefer lighter roasted coffee but require a wide range of qualities. Historical trade relations remain essential in shaping the international coffee trade. A significant portion of East African coffee goes to Germany and the United Kingdom. France has close ties with Côte d'Ivoire and other countries. Dutch trade relations with Indonesia are also important (Ponte 2002a).

The international coffee market is characterized by supply and demand's relatively low price elasticity. Supply flexibility is low in the short run and higher in the long run, as newly planted coffee plantations take at least two years to become productive and several years to reach total production levels. Demand for coffee only declines significantly when coffee prices are rising sharply. The specific characteristics of supply and demand price elasticity lead to highly volatile prices in the world coffee market. If supply is low, this will result in high coffee prices. Supply is slow to respond in the short term to new installations. In the long run, this will lead to a greater-than-necessary reaction as new coffee trees turn fruitful. It will be oversupplied, depressing prices (Ponte, 2002b)

Three historical stages of the coffee trade are identified and analyzed in the post-World War II period. First, the "ICA period" (1962–1989) regulated international coffee trade under the International Coffee Convention (ICA). Second, the post-ICA "liberalization phase" (1989–2007) is determined by the slow growth of market-driven differentiation along the lines of formal regulatory infrastructure and quality and sustainability characteristics. Third, the "diversification and re-consolidation phase" (from 2008 to the present), characterized by the restructuring of coffee roasters and the increasing use of tracking tools in supply chain management, is characterized by increasing sustainability and quality expectations (Grabs & Ponte 2019; Muradian & Pelupessy 2005; Ponte 2002a).

### **3.2. Voluntary regulatory schemes in the coffee industry**

Several articles deal with voluntary regulatory regimes. The development of the diversity of these systems is a critical element of the current process of globalization. In response to the growing demand from wealthy consumers for information on production conditions, certification and labeling schemes, codes of conduct, and private self-regulatory schemes have appeared on a comprehensive list of global economic sectors. These systems usually set quality, social or environmental standards and typically involve a greater degree of coordination, traceability, and oversight across different actors in the supply chain. Codes, certificates, and labels are tools for encoding information and increasing consumer confidence. They reduce customer inspection costs and allow suppliers to prove their skills and production standards. In principle, voluntary regulatory regimes are due to the need for greater coordination of activities between different actors to comply with standards and generally lead to product differentiation. Private (self-audited) regulatory systems should lead to more muscular coordination as they increase the amount and complexity of non-market information exchanged. Schemes controlled by third parties also result in a greater exchange of information while increasing the ability to codify information (reducing specificity), thereby inducing a weaker degree of coordination. In practice, however, in some third-party voluntary regulatory regimes, the interaction of agents may involve the exchange of significant "extra standard" information, creating the conditions for more vital coordination. Extra standard information refers to critical information involved in supply chain management that is not related to the standards encoded in the codes/certification protocols. For coffee, this includes consistency in quality, supply reliability, managerial performance, and the place of origin of suppliers (Gereffi 2018; Gereffi et al. 2001; Muradian & Pelupessy 2005).

### **3.3. The first phase of coffee sustainability (1988-2003)**

Fairtrade in Europe has developed Europe in response to the 1989 collapse of the International Coffee Organization (ICO) price management mechanism and subsequent record low coffee prices (Potts et al. 2014). Several civil society organizations have teamed up to target key markets by developing a system of standards, certification, and labeling. Max Havelaar followed this in the Netherlands in 1988 and other similar initiatives across Europe in the 1990s, which allowed coffee companies to apply the standards in their supply chains and use the Fair Trade label under a license agreement. The standard was based on the concept that producers should be paid according to the cost of producing coffee and not on the price set by the international market. In 1997, Fairtrade Labeling Organizations International (now Fairtrade International) was established in Bonn, Germany, to harmonize national organizations' standards and certification systems under one umbrella. Fairtrade International currently includes 29 labeling initiatives and marketing organizations and three producer networks (Millard 2017). The fair trade standard did little to address environmental issues. In contrast, when fair trade coffee labeling

began in the United States in 1999, conservation organizations have already advocated using market forces to encourage sustainable coffee production (Myers et al. 2000).

New research on biodiversity and traditional agroforestry coffee production systems has been rapidly applied in market approaches. The Rainforest Alliance was founded in 1986 in New York City and the Conservation International in 1987 in Washington, home of the Smithsonian Institution. In the 1990s, in collaboration with Latin American research organizations, these organizations played a pioneering role in producing and selling coffee to preserve the world's biodiversity and critical habitat for species. The Rainforest Alliance has built a network of like-minded nonprofits from important coffee-producing countries in Central and South America (Millard 2017; Noponen et al. 2017).

The growing specialty coffee market provided the initial impetus for environmentally friendly coffee production. While coffee was the same consolidation of prominent traders and roasters as other tropical commodities, it has always retained a vibrant representation of smaller, specialized companies. The new certification labels and concepts behind them provided an opportunity to differentiate. In 2001, the Specialty Coffee Association of America published a Sustainable Coffee Survey for the North American Specialty Coffee Industry, which concluded that (the North American Specialty Coffee Market) can shape new solid trends and global influence consumption (Giovannucci 2001). The report defines sustainable coffee as coffee grown under the organic, fair trade, or shadow production system.

### **3.4. The second phase of coffee sustainability (2004-2017)**

By the early 2000s, a market approach to sustainable coffee had emerged, supported by a growing consumer commitment to purchase coffee and other products from farms under sustainable farming systems (Millard, 2017; Potts et al., 2014). It aligns product demand with the values that consumers want to express in their purchases. New movements have emerged that have demanded transparency and fairness in their purchasing behavior from civil society organizations (Panhuysen & Pierrot 2014).

The fair trade system sets a minimum price for coffee growers and focuses on smallholder cooperatives and organizations to strengthen their position in the supply chain. The Sustainable Agriculture Network was the first standard to ban deforestation explicitly. It requires the conservation of water and soil, the proper use and storage of agrochemicals, the treatment of waste and sewage, secure employment contracts for workers, and equal treatment for men and women (Millard 2017).

As companies have recognized, they have begun to make sustainability a part of their business, rather than separate corporate social responsibility programs. Given that all coffee producers have a common interest in a continuous supply of coffee, their increased awareness of the problems and their commitment to investing in solving their business has also resulted in cooperation (Matten & Moon 2008).

In 2014, the Farm Sustainability Assessment launched a farm sustainability assessment tool for companies to assess the sustainability of farms through a single benchmark of different codes and standards. Rainforest Alliance website created from interactive resources. In February 2017, the Sustainable Coffee Challenge and the Global Coffee Platform signed a Memorandum of Understanding to work together towards a shared vision for 2020. new tools to guide companies towards sustainability, structured dialogue between North American and European initiatives, and increased transparency (Millard 2017; Panhuysen & Pierrot 2014).

## **4. Conclusions**

Overall, the number of scientific publications in coffee increased exponentially during the period under review. During the literature processing, it has become apparent that there are few publications on the global coffee trade. The main topic is fairtrade trade and various regulations. The Grabs and Ponte (2019) pair examined the global value chain. It has been concluded that recent changes in the global value chain of coffee towards a more heterogeneous and layered product portfolio may give constitutive power to actors in the producing country. Rueda and Lambin (2013), a study of the coffee value chain, found that in 2010, farmers received a small fraction of the total value of coffee captured on the market. It has also been shown that, in a given year, farmers producing certified coffee and those who belonged

to regions where they make good quality coffee achieved a slightly higher value than those who produced traditional coffee in areas where they were not particularly sought after. Respectively, the two pairs of authors said that the premiums paid to farmers for differentiated coffees are not independent of international price movements; on the contrary, they show counter-cyclical behavior and shrink in times of high global prices. As a result, farmers selling in differentiated markets do not receive a fixed premium but a less volatile price than traditional coffee providers.

Taylor (2005) concluded that Fair Trade coffee and FSC initiatives struggle with contradictions stemming from the fact that they cannot isolate themselves from mainstream markets if they want to make meaningful progress toward their goals. Fair Trade brings significant benefits to many coffee growers, and this initiative poses a challenge to the traditional market. The market operation of FSC continues to be fundamentally shaped by industrial solid and retail interests. Neither Fair Trade coffee nor the FSC initiatives alone are likely to change the coffee market to such an extent that the market puts people and the environment at the center of production, trade, and consumption. Naegele (2020) states that most of the Fair Trade price premium is given to roasting plants that create brand value. Retailers are estimated to profit less from Fair Trade-certified coffee than from traditional coffee. This result suggests that Fair Trade certification provides market power to roasters companies compared to the retailer. Millard (2017) argues that the market approach to coffee sustainability involves robust independent standards and certification schemes, custom corporate schemes, and industry initiatives. Investments in the industry include the payment of premiums to compensate farmers for applying sustainability practices, the training and technical assistance of farmers to enable their application, and the gradual support of off-farm processes on the broader community to reduce systemic social and environmental problems. Standards and certification schemes provide a codified approach to managing, monitoring, and communicating sustainability. Strong consumer confidence serves as an unparalleled market mechanism to turn these consumers' expectations into positive outcomes for coffee farms. The coffee trade has been examined from different perspectives, but it can be said that everyone agrees that changes are needed.

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