

GLOBAL MARKET REPORT

Coffee prices and sustainability

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Market Overview

Despite the effects of the COVID-19 pandemic, global coffee supply and demand have grown.

From the Ethiopian forests where—as the legend goes—goat herders first discovered it, coffee has become a staple for many consumers (Deshmukh, 2021). Coffee is one of the world’s most traded commodities and consumed beverages (Food and Agriculture Organization of the United Nations [FAO], 2022b). The coffee plant is a shrub or small tree that needs about 3–4 years to start producing red cherries, which are then strip- or hand-harvested (National Coffee Association, n.d.). Strip harvesting, which can be mechanized, involves removing all the cherries from the branch at once, while hand harvesting, a more labour-intensive process, consists of selectively harvesting ripened cherries. Harvested coffee cherries are processed immediately using a dry or wet method to facilitate the milling process, which involves hulling to extract the coffee bean (green coffee) and an optional polishing step before being graded and sorted by weight, size, and quality so they can be sold (National

Coffee Association, n.d.). Green coffee beans are then roasted to unlock their flavour, becoming brown roasted beans, which are ground and brewed to produce the coffee beverage we commonly enjoy.

Arabica and Robusta are the two main coffee species that have come to dominate the market, with global production in 2020 consisting of about 58% Arabica and 42% Robusta (International Coffee Organization, 2021, p. 9). While many factors affect quality, Arabica coffee has historically been considered higher quality as it has a smoother, sweeter taste. Robusta has twice the caffeine content, making it more bitter and well suited for ready-to-drink applications and espresso blends (Petruzzello, 2021). Fine Robusta Standards and Protocols were introduced in 2019 to improve the quality of coffee made with Robusta (Impallomeni, 2019). The Arabica coffee plant is more sensitive to higher temperatures and must be grown in subtropical climates at altitudes of 600 m to 2,000 m. It is well suited for agroforestry and shaded environments (Petruzzello, 2021). Robusta coffee is more resistant to temperature fluctuations and can be grown from sea level to 600 m in full sun (Petruzzello, 2021). It is also more disease resistant and

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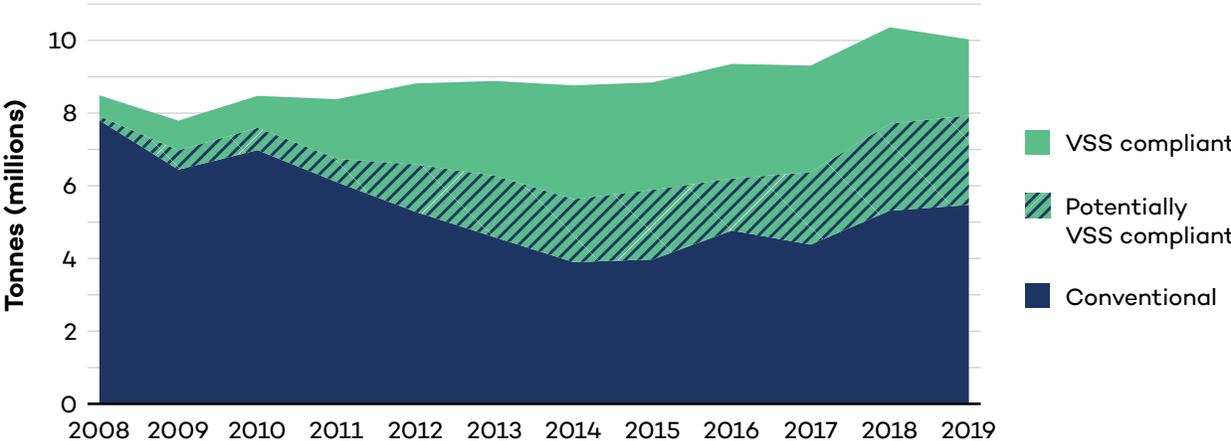
There are 12.5 million coffee farms in the world. 95% of coffee farms have an area of 5 ha or less. 84% have less than 2 ha.

generally produces higher yields. Today, coffee has become a highly sophisticated product, with producers and roasters developing a wide range of varieties and flavours to meet different users’ expectations and to respond to consumption trends.

The coffee sector has grown into a lucrative business downstream, reaching a retail market value of approximately USD 102 billion in 2020. It is expected to continue expanding at a compound annual growth rate (CAGR) of at least 4.28% from 2021 to 2026 (Mordor

Intelligence, 2021). The coffee value chain provides direct employment to an estimated 125 million people worldwide (Fairtrade Foundation, 2022). The U.S. coffee industry alone employed almost 1.7 million people in 2015. Coffee is grown on 12.5 million farms around the world, predominantly run by smallholder farmers cultivating 5 ha or less—indeed, 95% of coffee farms span 5 ha or less and 84% span less than 2 ha (Panhuisen & Pierrot, 2020, p. 56). Smallholder farmers account for most global coffee production as they comprise 73%–80% of coffee farmers globally (Fairtrade Foundation, 2022; Panhuisen & Pierrot, 2020, p. 56). Larger estates produce the remainder, with coffee estates greater than 50 ha rarely found outside of Central and South America (Panhuisen & Pierrot, 2020, p. 56).

Figure 1. Global coffee production from 2008 to 2019. Coffee that complies with voluntary sustainability standards (VSSs) reached 21% to 45.4% of total production in 2019.



Note: Conventional production volumes do not comply with a VSS, while VSS-compliant production volumes refer to coffee produced in compliance with at least one VSS. Production volumes that are defined as potentially VSS compliant cannot be definitively identified as conventional or VSS compliant with the data currently available.

Source: FAO, 2022a; Meier et al., 2021.

Coffee production increased from about 8.5 million tonnes in 2008 to 10.7 million tonnes in 2020 from cultivating 11 million ha, according to the FAO (2022). Production has not slowed over the last decade as its CAGR of 1.53% from 2008 to 2019 jumped to 2.73% from 2014 to 2019. About 80% of coffee production was exported in 2021/2022, up from 64% in 2020 and 74% in 2019, providing an important source of foreign exchange revenues for exporting countries (FAO, 2022a; Foreign Agricultural Service, 2021; United Nations, 2022). Brazil, Vietnam, and Colombia have consistently been the highest-producing countries and largest exporters since 2016, exporting some 33 million, 29 million, and 14 million 60-kg bags, respectively, in 2021/2022. The European Union (EU), United States, and Japan have consistently been the largest importers over this period, importing about 43 million, 26 million, and 7 million 60-kg bags, respectively, in 2021/2022 (Foreign Agricultural Service, 2021, p. 9). Global coffee supply and demand have remained fairly stable over the last 5 years, with supply exceeding demand by 1%–4%. Nevertheless, rising demand is expected to outstrip supply starting in 2021/2022, while supply is expected to drop, mostly due to unfavourable weather conditions (Foreign Agricultural Service, 2021; International Coffee Organization, 2022, p. 9).

The COVID-19 pandemic has been particularly challenging for the coffee sector as coffee is primarily grown for export (Foreign Agricultural Service, 2021, p. 9). On the production side, COVID-19 has disrupted the availability of labour, inputs, and extension services and made it difficult to move products to markets (Panhuysen & Pierrot, 2020, p. 56). Despite these

challenges, global coffee production in 2020 rose by about 660,000 tonnes from 2019 (FAO, 2022a). Shipping disruptions have boosted transportation costs and affected product quality and availability (Hernandez et al., 2020, p. 12; Mera et al., 2021, p. 43). Furthermore, government public health measures due to the pandemic have limited and prevented out-of-home coffee consumption (Mera et al., 2021, p. 43; Mordor Intelligence, 2021). Nevertheless, demand remained strong as companies over-purchased coffee to guarantee production and sales and drew on stockpiles to maintain product output (Mera et al., 2021, p. 43). End consumers have also shifted their consumption patterns by moving to online shopping and at-home coffee consumption options (Mordor Intelligence, 2021).

Climate change continues to threaten the long-term viability of the coffee sector.

The disruptions of the pandemic on the global coffee value chain provide a cautionary tale for current and anticipated climate change impacts. Changing climatic conditions are expected to render some coffee-growing regions no longer suitable (Grüter et al., 2022). Based on global climate models used to explore three climate scenarios and soil conditions, highly and moderately suitable Arabica coffee-growing environments around the world are expected to decrease by 50% and 30%, respectively, by 2050 (Grüter et al., 2022). The effects of climate change are also expected to lead to the emergence of existing and new coffee pests and diseases as well as the loss of productive agricultural

lands, which will invariably affect coffee farming (Pham et al., 2019). For instance, the coffee leaf rust fungus greatly impacted coffee production in various parts of Latin America from 2012 to 2017, causing an estimated USD 3 billion in losses and negatively affecting 2 million farmers (McKenna et al., 2020; Pham et al., 2019). More recently, severe and unexpected frost in Brazil's coffee belt in June and July 2021 caused global coffee prices to spike by 13% (Foreign Agricultural Service, 2021, p. 9; Figueiredo & Teixeira, 2021).

Although coffee farmers are used to fluctuating weather patterns, they will need to adapt to less predictable growing conditions and more extreme climatic events. More attention to climate resilience is especially important in coffee cultivation, as it requires long-term planning to get a return on investment. The vast majority of today's production comes from smallholder farmers with fewer resources to cope with shocks, making them more vulnerable to climate change. Numerous adaptation measures exist in the coffee sector. These include moving production to areas with more suitable climates and switching to more climate-resilient species such as Robusta or adopting more sustainable farming practices, like shade-grown coffee to reduce temperatures or mulching to maintain soil moisture (Pham et al., 2019). Some countries have started climate-proofing their coffee sectors. For instance, an estimated 85% of Colombia's coffee now consists of leaf rust-resistant varieties, and areas projected to offer suitable coffee-growing conditions are being mapped (Boer et al., 2020; David, 2021; Foreign Agricultural Service, 2021, p. 9). Vietnamese coffee growers commonly intercrop their

Robusta coffee plants with fruits such as avocado and durian and are working to improve their irrigation efficiency to lower costs and maintain productivity (Foreign Agricultural Service, 2021, p. 9; Hofstetter, 2016; International Union for Conservation of Nature, 2020).

Moving coffee production to more suitable areas must be done carefully to prevent ecosystem losses (i.e., deforestation or degradation), which will exacerbate climate change (Panhuysen & Pierrot, 2020, p. 56). For instance, coffee cultivation in the Peruvian Amazon was directly responsible for a quarter of its deforestation in 2012, and the upward expansion of coffee farming continues to pose a high risk to forested and protected areas (Panhuysen & Pierrot, 2020, p. 56; Rainforest Alliance, 2021a, p. 14; van Dijkhorst et al., 2017, p. 11). Additionally, consuming countries increasingly put legislative frameworks in place to ensure that industry players understand and mitigate deforestation risks in their supply chains, such as the EU proposal for a regulation on deforestation-free products. What is clear is that coffee farmers will have to become more resourceful and diversified by varying cropping patterns and livelihood activities to face changing weather patterns that will affect different parts of the global coffee value chain in unpredictable ways (Foreign Agricultural Service, 2021, p. 9).

Despite its vulnerability to the effects of climate change, coffee farming has climate change mitigation and adaptation potential. While deforestation-free farming is essential to slow global climate change and biodiversity losses, coffee cultivation offers tangible opportunities to restore mixed-use forests in coffee-growing regions around the

world. Agroforestry techniques that cultivate trees with crops, regenerative agriculture practices that restore degraded land and ecosystems, and intercropping can provide shade and cooler environments suitable for growing good-quality Arabica coffee while sequestering carbon and diversifying revenue crops (Ahmed et al., 2021; Pham et al., 2019). For example, coffee farmers in Peru's Alto Mayo Protected Forest have been able to weather the COVID-19 pandemic by growing more sustainable certified coffee through agroforestry practices and generating revenues by selling carbon credits via the United Nations REDD+ programme¹ (Bauza, 2021; Specialty Coffee Association, 2021). It is clear that regenerative coffee farming systems will be required not only to halt—but also reverse—the degradation of natural environments and rural communities around the world and to restore them. This can be done by building healthy and fertile soils that can retain and filter water, returning shade trees, and enhancing wildlife habitats (Murphy & Lilliston, 2022; Vu Le et al., 2021).

Coffee produced in compliance with VSSs offers opportunities to improve the sustainability and resilience of the sector.

Efforts are ongoing to move the coffee sector toward sustainability and improve farmer resilience to face challenges such as climate change. The implementation of VSSs, which began in the sector more than 30 years ago, is one of these efforts. Complying with a VSS allows farmers to differentiate themselves from conventional coffee producers in the marketplace (Voora et al., 2019, p. 6). In exchange for adopting farming practices that can provide benefits to the environment and communities, farmers can label and sell their products as VSS compliant.

VSSs in the coffee sector typically require farmers to adopt more sustainable farming practices, such as soil, water, forest, and energy conservation measures that can make their operations more resilient to changes, including extended droughts (Voora et al., 2022). VSS-compliant farmers may also get higher prices and premiums for their coffee and establish stronger links with buyers, which can help them cope with market fluctuations (Bianco, 2020; Elder, 2021, p. 9). While offering numerous potential benefits, VSSs can be further strengthened to improve farmer resilience to challenges such as climate

¹ “REDD+, which stands for Reduce Emissions from Deforestation and Forest Degradation while fostering forest conservation, is a framework created by the UNFCCC Conference of the Parties (COP) to guide activities in the forest sector that reduces emissions from deforestation and forest degradation, as well as the sustainable management of forests and the conservation and enhancement of forest carbon stocks in developing countries” (United Nations Framework Convention on Climate Change, 2022).

change and human health pandemics (Bianco, 2020; Elder et al., 2021, p. 168).

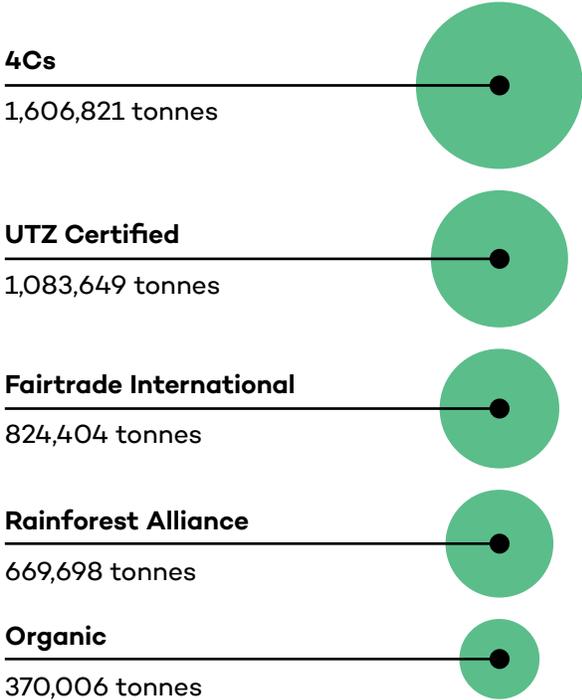
In 2019, more than 1.1 million farmers produced 2.09 million–4.55 million tonnes of VSS-compliant coffee, with a total farm gate value of between USD 4 billion and USD 11 billion. This is a drop of 460,000–570,000 tonnes from the previous year (Meier et al., 2021). The farm gate value estimate was derived from FAO averaged producer prices per tonne multiplied by VSS-compliant coffee volumes produced per country. The most prominent VSSs in the coffee sector, ordered by 2019 production volumes, are 4C (1.61 million tonnes), UTZ (1.08 million tonnes), Fairtrade (0.82 million tonnes), Rainforest

Alliance (0.67 million tonnes), and Organic (0.37 million tonnes) (see Figure 2) (Meier et al., 2021). Since the Rainforest Alliance and UTZ Certified merger in 2018, the UTZ standard and correspondent label are gradually being replaced by the Rainforest Alliance Certification Program and labelled with the new Rainforest Alliance seal from 2020. The Global Coffee Platform (GCP) (2022) supports all of these initiatives and has created an Equivalence Mechanism based on the GCP Baseline Coffee Code to establish a baseline of more sustainable practices in the industry.

VSS-compliant coffee, which grew at a CAGR of 13% to 19% between 2008 and 2019, now represents 21% to 45% of total global production (see Figure 2) (Meier et al., 2021). Despite this significant growth, there are signs that the supply of VSS-compliant coffee may be declining as its CAGR contracted between 1% and 7% from 2014 to 2019. Almost all of the losses in VSS-compliant production are due to a drop in 4C coffee, which fell from 2.76 million tonnes in 2016 to 1.61 million tonnes in 2019. This downward trend can also be partly explained by coffee buyers shifting from sourcing coffee that complies with third-party-certified or verified VSSs to coffee that complies with their own second-party corporate sustainability programs (i.e., Tchibo) or the use of other frameworks to report on their sourcing practices (i.e., Global Reporting Initiative, UN Global Compact) (Panhuysen & Pierrot, 2020). Additionally, supply outstripping demand may have discouraged farmers from becoming and remaining VSS-compliant (Meier et al., 2021), especially if markets do not incentivize the consumption of VSS-compliant coffee.

How much coffee is compliant (by VSS)?

Figure 2. VSS-compliant coffee production volumes in 2019

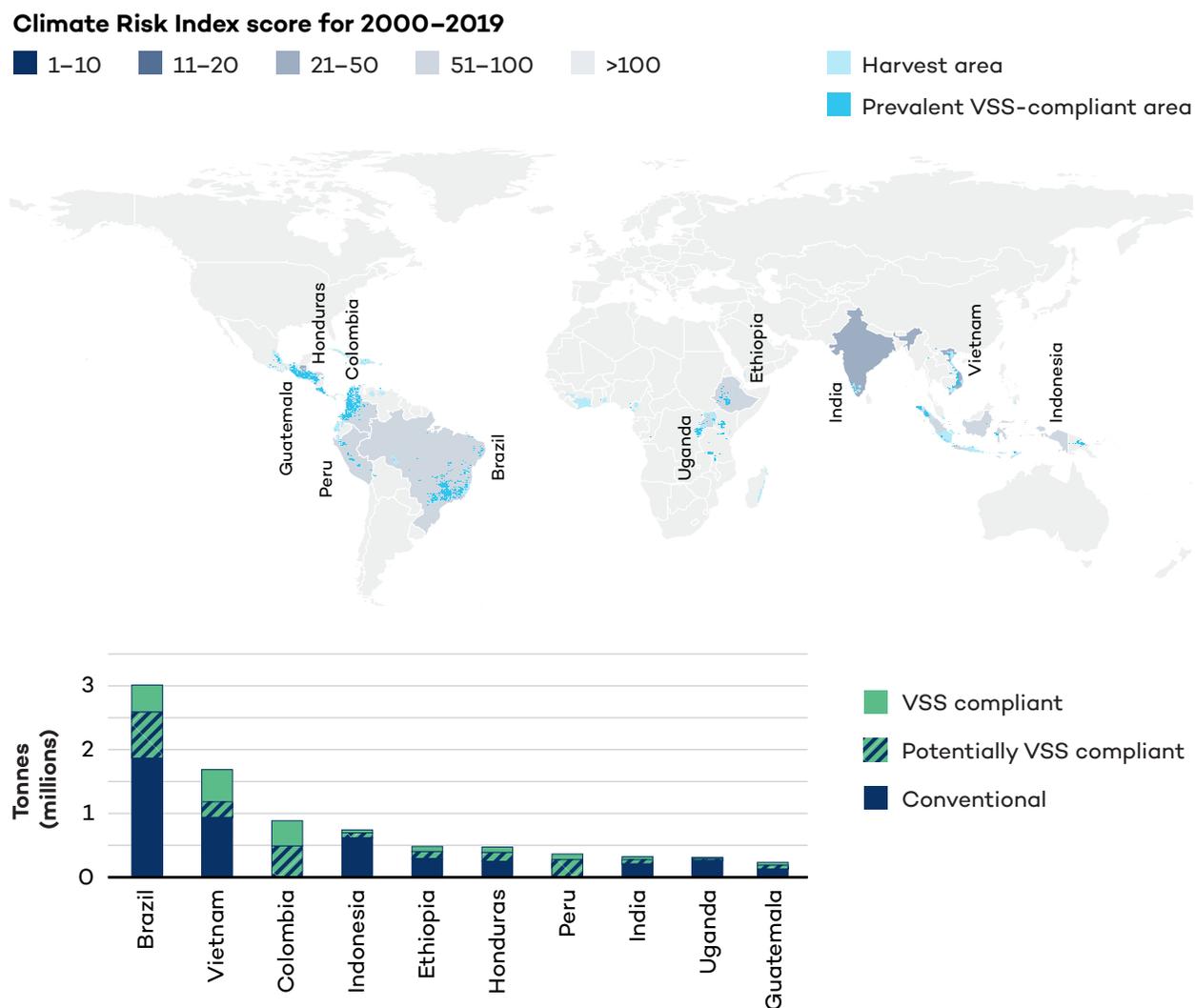


Source: Meier et al., 2021.

In 2019, almost 60% of VSS-compliant coffee came from Latin America and the Caribbean (Brazil, Colombia, and Peru), followed by Asia (Vietnam, Indonesia, and India) and Africa (Ethiopia, Côte d’Ivoire, and Uganda). Vietnam produced the most VSS-compliant coffee that year, reaching some 506,000 tonnes (see Figure 3).

According to our analysis, Brazil, Vietnam, Indonesia, Colombia, and Ethiopia offer VSSs the greatest potential to expand based on the size of their conventional coffee production. Among the least developed countries producing coffee, the Democratic Republic of the Congo, Ethiopia, Guinea, Haiti, and Yemen offer VSSs the most opportunities to promote sustainable development by

Figure 3. Coffee Growing Regions of the World: Distribution of coffee production in the top 10 producing countries in 2019



Note: Countries with lower Climate Risk Index scores are those that have been most impacted by extreme weather events in the reference period.

Sources: Meier et al., 2021; FAO, 2022a; Eckstein, D., et al. 2021; Voora, V. et al. 2019

MARKET VALUE

More than 1.1 million farmers produced 2.09 million–4.55 million tonnes of VSS-compliant coffee with a total farm-gate value of USD 4 billion to USD 11 billion.

CAGR

Conventional production contracted at a CAGR of 3.17% from 2008 to 2019, but grew at 7% from 2014 to 2019.

VSS-compliant production grew at a CAGR of 13% to 19% between 2008 and 2019 but contracted to between 1% and 7% from 2014 to 2019.

adopting more sustainable coffee farming practices based on their share of global coffee production, limited presence of VSSs, and Human Development Index ranking.

Equally important, VSS-compliant coffee farming can also result in higher yields compared to conventional production. Our analysis shows that in 2019, VSS-compliant coffee yields were higher in 21 coffee-producing countries, potentially about the same in three, and lower in 16. VSS-compliant yields tended to be higher in larger coffee-producing countries, such as Brazil, Vietnam, Colombia, Indonesia, and Honduras. Ethiopia, Laos, and China are exceptions, as VSS-compliant coffee yields were lower than conventional coffee yields in these major coffee-producing countries (FAO, 2022a; Meier et al., 2021). This may be partially explained by the fact that coffee-producing regions with well-functioning farming cooperatives and a supporting environment may be better able to take full advantage of VSS-compliant practices for their members,

which can also result in higher productivity levels (Le Coq, 2016).

Demand for VSS-compliant coffee is increasing, but not enough to balance supply.

The availability of VSS-compliant coffee sold as conventional coffee is another challenge hindering its long-term viability, as some companies source VSS-compliant coffee at lower conventional prices to benefit from their risk mitigation benefits. Between 2008 and 2019, only 12% to 65% of VSS-compliant coffee production was sold as such (Meier et al., 2021). In some cases, coffee farmers who cannot sell their product as VSS-compliant do not receive premiums and consequently struggle to pay the costs of maintaining their certification (Centre for the Promotion of Imports from developing countries, 2021; Mongabay.com, 2021). Falling incomes due to poor prices and higher production costs in 2020 because of COVID-19 supply chain disruptions—coupled with farmers' reliance on coffee as the main source of livelihoods—have led to higher poverty rates among smallholder coffee farmers (Mongabay.com, 2021). This, in turn, prevents farmers from investing further in sustainable production and climate resilience (International Coffee Organization, 2020, p. 14).

Although the global supply of VSS-compliant coffee is decreasing, demand for VSS-compliant coffee continues to grow in traditional markets (Europe and North America). Nevertheless, this growth has not yet caught up with supply, leading to an

ongoing oversupply of VSS-compliant coffee. As mentioned above, this supply–demand gap may be reducing global VSS-compliant coffee production. Consumer preference for more sustainable coffee consumption options has strengthened during the pandemic, particularly in traditional markets (Centre for the Promotion of Imports from developing countries, 2021). A GlobalData consumer survey found that the consumption patterns of 43% of all coffee drinkers are influenced by “ethical, environmentally friendly, or socially responsible coffee options” (GlobalData Consumer, 2020). Many European retailers, including ALDI, Lidl, and Sainsbury’s, have developed their own sustainable product lines using VSS-compliant coffee, which has boosted sales (Centre for the Promotion of Imports from developing countries, 2021).

Nevertheless, it is still too early to know what sort of impact the upcoming EU regulations on corporate sustainability due diligence and corporate sustainability reporting will have on the production and consumption trends of VSS-compliant coffee, as countries within the EU are the main consumers (European Commission, 2022). Furthermore, what happens if coffee buyers do not find VSSs to be a potential tool to help them comply with these regulations or if VSSs do not adapt accordingly?

The former regulation will require targeted companies to implement, monitor, and report on due diligence activities conducted throughout the entire value chain to identify and prevent potential adverse human rights and environmental impacts, minimize the effects of actual impacts, and establish complaint procedures for the benefit of communities. The new regulation—in the consultation phase—will require targeted

companies to report on environmental, social, and governance issues, including climate change, pollution, water resources, biodiversity, workers, affected communities, and business ethics related to three corporate areas: a company’s strategies and assessments on the potential positive and adverse impacts of its direct and indirect operations; implementing measures such as policies, targets, action plans, and budget allocations; and performance measurement on a specific set of metrics (KPMG, 2022).

Both regulations target environmental and social issues that most VSSs cover in their production requirements and can help coffee growers adopt practices that can benefit the environment and communities while reducing harm. Most VSSs operating in the coffee sector also have assurance and grievance mechanisms in place that may align with these regulations. Still, all VSSs are different in terms of the stage of the value chain and related requirements they cover; their effectiveness in supporting farmers in adopting VSS-compliant practices and verifying their compliance; and how they incorporate performance metrics, measurement guidelines, and technology to support this data journey. Going forward, a more in-depth review is needed of the potential alignment and gaps between VSSs operating in the coffee sector and regulations to support the coffee buyers complying with them.

Beyond traditional markets, VSS-compliant coffee consumption in producing countries and emerging economies such as Russia, China, and Indonesia has historically been very low. However, these markets offer great potential, as domestic consumption rates have been growing exponentially, primarily

due to millennials with higher disposable incomes. For instance, VSS-compliant coffee remains niche, but its popularity is growing in Colombia as households have more disposable income (Federación Nacional de Cafeteros de Colombia, 2020, p. 107). In Indonesia, increasing VSS-compliant production may be due to a growing domestic market with more roasting facilities and coffee shops serving high-quality coffees with sustainability claims (Food ingredients Asia, 2022, p. 23).

While younger generations are generally more willing to pay for VSS-compliant coffee, many people in emerging economies are still limited by price. Offering incentives to consumers to buy VSS-compliant coffee can stimulate sustainable consumption (Meier et al., 2020, p. 88). This can include subscription services where consumers pay in advance for sustainable product baskets with coffee or chocolate at discounted prices (Alves, 2021).

Uncertainty about VSS-compliant coffee and greenwashing remains challenging. On-the-go coffees, typical coffee shops, and street vendors offer fewer prepared coffee options than what is available in supermarkets, making it harder for their clients to choose VSS-compliant coffee. In Colombia, most consumers do not know what VSS logos mean or distrust their credibility (Velez, 2020). Indonesian consumers have been subject to greenwashing and misled by companies so they can charge premiums (Food ingredients Asia, 2022, p. 23).

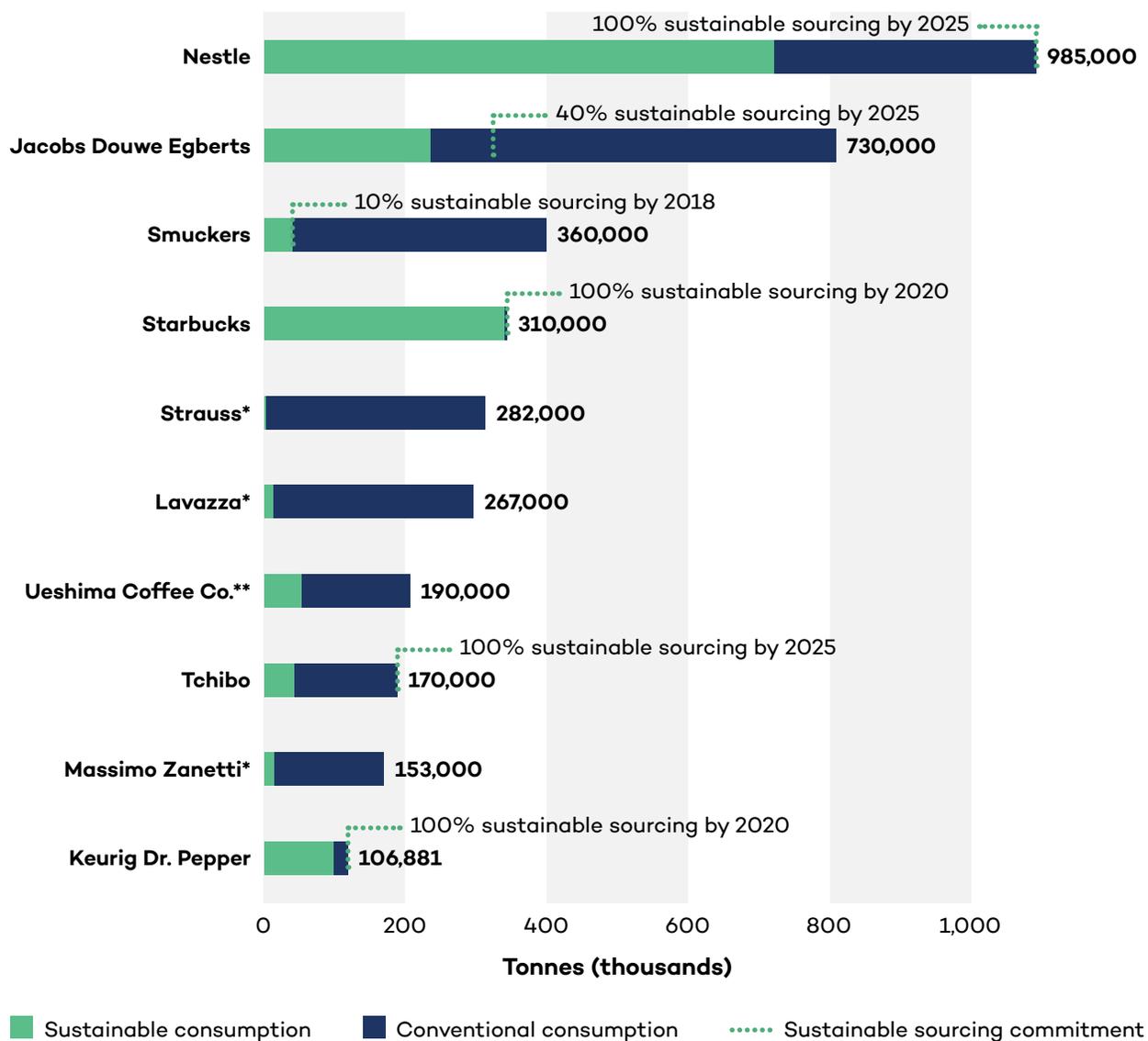
Nevertheless, communication campaigns such as the Global Coffee Platform's efforts to educate consumers and promote local VSS-compliant coffee consumption can encourage sustainable consumption in these

emerging markets (Global Coffee Platform, 2019, p. 30; Pierides, 2019; Sierra, 2020). In Colombia, Toma Café's promotional campaigns, barista training programs, and marketing strategies have reached a broad range of consumers, including young adults and students, some with prior interest and knowledge of sustainability (Euromonitor International, 2015). Building trust and transparency is key to shaping consumer behaviours, especially when many hope to adopt more sustainable lifestyles.

The 10 largest coffee-roasting companies, which account for 35% of total global coffee sourcing (Panhuysen & Pierrot, 2020), bought an estimated 3.5 million tonnes of coffee in 2020, up from 3.31 million tonnes in 2016. About 1.4 million tonnes, or 39%, of all coffee purchased in 2020 was sustainably sourced and compliant with a VSS or a corporate sustainability initiative, such as Starbucks' C.A.F.E. Practices or Nestlé's Nespresso AAA. Corporate sustainability initiatives refer to sustainable coffee production programs created by private companies rather than by independent third parties. In terms of meeting sourcing commitments, Nestlé, Starbucks, and Smuckers almost met their targets by 2020. Major developments in sustainability sourcing commitments include JDE's 40% and Nestlé's 100% sustainable sourcing targets to be reached by 2025 and Ueshima Coffee Company's goal to reach 100% by 2030 for their own coffee brands. Strauss, Massimo Zanetti, and Lavazza have yet to set sustainable sourcing commitments. Based on these commitments and assessing them against current coffee sourcing information, an extra 570,000 tonnes of sustainable coffee could be sourced by 2025.

Sustainable sourcing commitments are yet to be met.

Figure 4. Major coffee-roasting companies and their sustainable sourcing commitments



*Note: Data not found for sustainable sourcing commitments.

**Note. Data refers to 2019 as per Coffee Barometer 2020.

Sources: Authors' estimations based on Panhuysen & Pierrot, 2020. Specific company sources: Keurig Dr Pepper, 2019; JDE Peet's, 2020; JDE Peet's N.V., 2020, p. 260; Lavazza, 2020, 2021; Massimo Zanetti Beverage USA, 2022; Navratil, 2021; Nestlé, 2020; Starbucks, 2020a, 2020b, p. 23; Strauss, 2021; Tchibo Coffee Service, n.d., and personal email correspondence with the company; The J.M. Smucker Co., 2020; Ueshima Coffee Company, 2022a, 2022b.

Although VSS-compliant production has declined in recent years, coffee-roasting companies may continue to adopt more ambitious sustainable sourcing commitments, and sustainable consumption in emerging economies may continue to rise. This could maintain and even boost demand for coffee compliant with a VSS and/or a corporate sustainability initiative. Still, demand may grow slowly, while the upcoming corporate sustainability due diligence and corporate sustainability reporting regulations in the EU, and other similar regulations that may emerge in other jurisdictions, may crimp the consumption and production of VSS-compliant coffee. This is why a prediction on VSS-compliant production can, at best, be viewed as an educated guess. A pessimistic outlook weighs a short-term decreasing trend in VSS-compliant production more heavily. This translates into a steady decline to about 1 million tonnes by 2025 due to a shift toward corporate sustainability initiatives, the effects of due diligence and corporate reporting regulations, and a continued inability to sell VSS-compliant products as such. A more optimistic outlook weighs the increasing long-term VSS-compliant production trend more heavily and projects a steady increase to more than 3 million tonnes by 2025.

VSS-compliant production is likely to contract in the short term. However, we predict that it will rebound to almost 2 million tonnes by 2025 as demand for sustainable coffee continues to grow, motivating sustainable coffee sourcing commitments, and VSS-compliant coffee farmers enjoy more success selling their harvest as a VSS-compliant product.

Consequently, we expect VSS-compliant coffee production to range from 950,000 tonnes to 3.31 million tonnes by 2025.

A Dive into Coffee Prices

Sustaining the coffee sector will require improving farm gate prices and the equitable distribution of information and profits.

Pricing is another crucial factor in the viability of VSS-compliant coffee, as it can determine if coffee farmers stand to gain financially from implementing VSSs. Efforts to shift the coffee sector toward sustainability, such as implementing VSSs, are partly driven by a need to internalize the external costs associated with the industry. Agricultural external costs are those typically not captured in the market price of agricultural products and not borne by farmers, such as the negative effects of agrochemical use on human health and the environment.

The external cost of conventional coffee grown in Mexico in 2017 was found to be USD 7.80 per kg of parchment coffee versus USD 3.50 per kg of parchment coffee for traditional and organic farming coffee production systems, which tend to have less detrimental socio-ecological impacts (de Adelhary Toorop et al., 2017). The external cost of certified versus conventional coffee grown by smallholder farmers in Vietnam was found to be 20% lower and 13% more profitable (generating annual profits of EUR 1,695/ha vs. EUR 1,472/ha) in 2016 (Verkooijen et al., 2016). Internalizing the external costs associated with the production of conventional coffee would make VSS-compliant coffee prices much more competitive. Therefore, examining how coffee

prices intersect with the sustainability of the sector is critical.

The behaviour of coffee market prices, which have been highly variable, affects the price that VSS-compliant farmers get. Coffee pricing has traditionally fluctuated with large swings that follow the international market price for coffee, or “C-price,” as coffee is also traded in the futures market. The C-price determines the price of coffee as it is bought and sold along the value chain. It serves as a pricing guide, benchmark, or price-discovery tool to buy and sell coffee, make business decisions, or plan investments.

For instance, the C-price dropped to historic lows in April 1975 (just before a massive frost in Brazil) and in October 2001, when coffee was traded at USD 0.4638/pound, with prices recovering and reaching highs in March 1977 of USD 3.08/pound and in April 2011 of USD 2.98/pound (Trading Economics, 2022). More recently, in August 2018, the international market price for coffee dropped below USD 1/pound for the first time in 12 years, a price considered well below the cost of production for most coffee farmers in the world (Specialty Coffee Association, 2019a), with new lows reached in 2019.

Several factors influence fluctuations of the coffee market price, the most important one being global supply and demand dynamics. Indeed, when the global supply of coffee outpaces demand fuelled by favourable weather, improved yields, production capacity via harvesting mechanization, increased cultivation land, or public support (i.e., subsidies), it pushes prices downward

(Ballard, 2010). When the global coffee supply and inventories are disrupted due to extreme fluctuations such as rising temperatures, droughts, frosts, pests, diseases (i.e., coffee leaf rust), and government policies (i.e., export quotas), it pushes coffee prices upward. For instance, fears of losing up to 40% of the coffee harvest in Brazil due to an unexpected frost pushed the international coffee price above USD 2 per pound in August 2021 (Perez & Batista, 2021). Other factors influencing the C-price include speculation (Hernandez et al., 2020) in the futures markets and exchange rate movements.

These fluctuations and coffee price drops are mostly felt by small-scale farmers in countries that depend highly on coffee exports as a source of income, such as Burundi, Uganda, and Honduras, where low farm gate prices coupled with higher production costs have resulted in losses or unsustainably low earnings (Estrella et al., 2019; FAO, 2018; Meier et al. 2020). In addition, many coffee smallholder farmers lack the experience and knowledge to use risk management tools to mitigate the price risks and are unable to protect themselves from market fluctuations. Coffee farmers are then in the most vulnerable position in the value chain. They are the first to be affected by low prices and price volatility but also the first to experience the effects of droughts, floods, and other weather events, intensified by climate change (Baptista & Jenkins, 2017, p. 32).

The C-price, along with certain factors that lead to great variability, influence farm gate prices in coffee across producing countries. These factors include coffee type, origin, quality, differentiation (i.e., specialty or sustainably grown coffee), level of association

and bargaining power of farmers, input availability, rural infrastructure, and the institutional environment, which plays a key role in determining the prices received by coffee farmers (Lerner et al., 2021; Lordemann et al., 2021). Agricultural policy and supporting actions of governments (i.e., coffee funds, subsidies) can—and do—make a huge difference in producers' livelihoods (Grabs, 2018). For instance, the Government of Honduras passes market price volatility onto producers much more directly, in contrast to the situation in Costa Rica or Colombia. Furthermore, poor infrastructure (i.e., roads, transport services to ports) in producing countries may lead to the use of intermediaries to transport the coffee from farm to port, reducing the price that coffee farmers obtain in the end (Lerner et al., 2021).

The coffee market is also highly competitive, with a few large companies and their value chains dominating it (Mordor Intelligence, 2021), which allows exporters and roasters to determine a favourable price for the coffee they buy from farmers (Econexus, 2013; ETC Group, 2019). They are also better able to transfer any price increase upstream and to end consumers, protecting themselves from coffee price volatility and exacerbating the inequality and power asymmetry of farmers.

The pattern in coffee shows that input costs increased by 8% annually between 2015 and 2020, but prices rose just 1% in the same period. As a result, some farmers break even while others struggle to cover their costs.

Coffee farmers also tend to receive the smallest margins in the value chain. The farm gate price and production costs determine coffee farmers' margins. Despite the differences in production costs across coffee farms, regions, and countries due to different taxes, transportation and input costs, the type of coffee grown, production methods, equipment, and technology (Cadena, 2019, p. 13; Estrella et al., 2019), the overall pattern in coffee shows that input costs rose 8% annually between 2015 and 2020, while prices advanced just 1% in the same period (Keen, 2020). As a result, some farmers break even while others struggle to cover their costs (Estrella et al., 2019).

In contrast, the greatest economic value is generated in the middle of the coffee supply chain: exporters and roasters. Exporters can get between 50% and 54% of the free on board (FOB) price in some cases (including cupping, grading, storing, milling, transport, taxes, export documentation, and margins)

(Nordic Approach, n.d.). They often pay premiums to farmers by making second payments to coffee cooperatives or coffee washing stations (Nordic Approach, n.d.). In many cases, however, they cannot collect information on how these premiums are distributed or invested back into the farming communities. Profit margin outcomes from an exporter's perspective are higher when selling coffees with high-quality scores. The lowest margins for all actors in the value chain involve the production and sale of ordinary or low-grade fully washed coffees (Church, 2018).

Roasters usually enjoy the highest gross profit margins in the coffee chain (44% to 65%). A study by the Specialty Coffee Association found that when costs are considered, the net profit margin can vary from 7% to 12% (Bellwether Coffee, 2021; Specialty Coffee Association, 2017). However, one of the key issues is also the hidden trade margins and prices paid by roasters to farmers, or

Table 2. Minimum prices and premiums for coffees negotiated through the Fairtrade Labelling Organization contract system in USD/lb, Arabica and Robusta. FOB prices paid for Fairtrade (2020).

Type of coffee	Conventional	Fairtrade minimum prices + certified Organic	Fairtrade premium
Washed Arabica	1.26	1.41 plus the Organic differential: +30 cents	+20 cents
Non-washed Arabica	1.20	1.35 plus the Organic differential: +30 cents	+20 cents
Washed Robusta	1.05	1.05 plus the Organic differential: +30 cents	+20 cents
Non-washed Robusta	1.0	1.01 plus the Organic differential: +30 cents	+20 cents

Source: Authors, with data extracted from Fairtrade International, n.d.

indirect payments in the form of community infrastructure or social programs. Large multinationals and coffee roasters such as Starbucks, Nestlé, and JDE tend not to disclose how much they pay for their coffee or whether they guarantee minimum prices or offer premiums.

Coffee buyers who trade directly with farmers tend to be more transparent about prices. Some publish and update pricing data regularly on their websites and direct trade platforms (i.e., Typica, Beyco) and in annual reports. This allows farmers to assess coffee market prices and better negotiate the price for their coffee when engaging directly with the roaster (Southey, 2021). Farmers selling through direct trade tend to receive higher prices for their coffee and have better profit margins because they save costs such as registration fees or exporter fees (Oden, 2021).

VSSs can improve farm gate coffee prices, but more must be done to increase farmers' income.

In this context, VSS settlers are one actor among others who have established a few measures to increase coffee farmer prices and mitigate the historical price volatility, including minimum prices and premiums. The most recognized are Fairtrade International minimum prices and Fairtrade International and Organic premiums. Other VSSs, such as Rainforest Alliance, began in 2021 to implement mandatory sustainability differentials, which are cash payments that coffee buyers make to compliant farmers

over and above the market price (Rainforest Alliance, 2021b).

In 2020, the coffee market price hovered around USD 1.20/lb for Arabica and USD 1/lb for Robusta, while Fairtrade minimum prices stood at USD 1.35/lb for the former and USD 1.01/lb for the latter. An organic differential of USD 30 cents/lb was added to this minimum price when farmers sold their coffee in compliance with the Organic scheme. The Fairtrade premium stood at USD 20 cents/lb (see Table 2).

These floor prices and premiums act as a baseline for coffee pricing because producers and traders can also negotiate higher prices for VSS-compliant coffees based on quality and other attributes (Southey, 2021; Specialty Coffee Association, 2019b). They enhance the transparency of coffee prices. The Fairtrade minimum price also protects farmers mainly when international market prices are depressed. Farmers may obtain higher prices if they grow specialty coffee, which refers to high-quality coffees with cupping scores exceeding 80 points, according to the Specialty Coffee Association Q-grading. For instance, the median price for coffees ranging between 82 points and 87 points in 2019/2020 was USD 2.60/lb (Specialty Coffee Association, 2020). However, this market makes up only about 30% or less of the coffee produced in the world. Specialty coffees that are sold in small quantities of micro-lots also tend to be less volatile from year to year (Kornman, 2020; Specialty Coffee Association, 2019b).

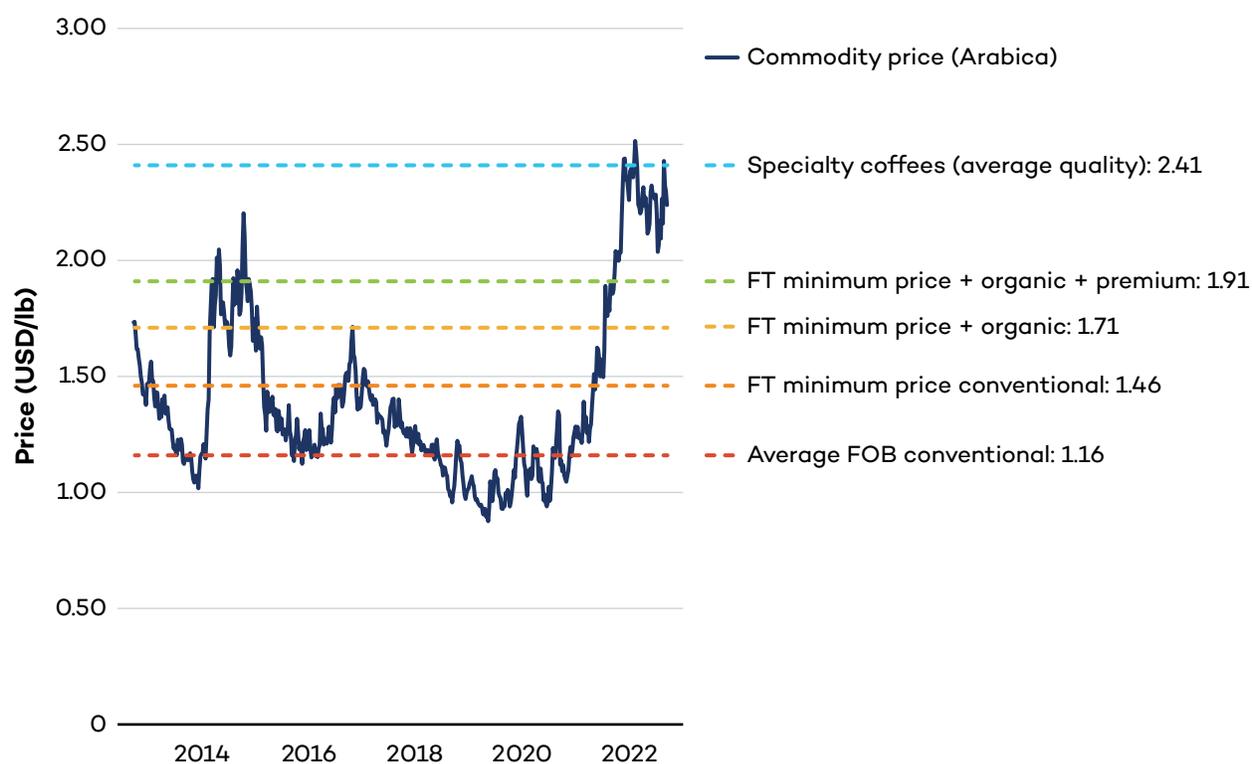
Prices reported for VSS-compliant and specialty coffees often refer to FOB and not to farm gate prices, as several transactions between farm gates and ports do not

usually stipulate prices in U.S. dollars per green pound. This complicates the process of calculating what really gets back to the farmers. Also, depending on the country and region (i.e., lack of institutional support, poor infrastructure) and the use of intermediaries who may keep a large part of the premiums for themselves, specialty and VSS-compliant farmers may end up receiving conventional market prices for their coffee (AgriLogic, 2018, p. 94). Some stakeholders in the sector, such as the Specialty Coffee Association and many specialty buyers, are trying to understand and compile information on how much of the FOB price makes it back to the farm gate to find out the real price farmers obtain.

To better illustrate the differences between conventional, VSS-compliant, and specialty prices, Figure 5 showcases coffee market prices from 2010 to 2021 (USD/lb); the average FOB prices received in East Africa, Latin America, and Asia for conventional coffee; prices paid by VSSs such as Fairtrade and Organic; and specialty coffees in the same regions. (Please note that these are average prices and do not reflect the reality of all coffee farmers).

According to our analysis and the data shown in Figure 5, coffee producers associated with at least one VSS—Organic or Fairtrade, based on data availability—may have received higher prices than the international market

Figure 5. Minimum prices and premiums for Fairtrade (FT) coffee, average conventional, and specialty coffee prices from 2011 to 2021



Source: Fairtrade International, n.d.; Specialty Coffee Association, 2019b; Trading Economics, 2022.

price from 2015 onward. Prices tend to increase with double certification of Fairtrade and Organic. The price that farmers get is even higher when selling specialty coffee (average quality) through direct trade, which reduces the number of intermediaries as farmers establish direct commercial relationships with roasters or importers. However, we can deduce from the graph that coffee buyers may be more willing to pay premium differentials for VSS-compliant coffee when international coffee prices are depressed, while premiums above the market price are less frequent for VSS-compliant coffee when market prices are higher and are more commonly paid for specialty coffee.

The price differentials that voluntary sustainability standards pay have sparked some concerns. Higher premiums will incentivize farmers to increase VSS-compliant production, but when demand for more sustainably grown coffee does not rise at the same pace as production, farmers are forced to sell their coffee at conventional prices and cannot recover the cost of using VSS-compliant practices. This can discourage farmers from continuing to comply and cause them to leave the schemes. As already mentioned, the supply of global VSS-compliant coffee fell between 1% and 7% CAGR from 2014 to 2019, with research suggesting that a lack of demand contributed to this decrease (Meier et al., 2020, p. 88; Meier et al., 2021).

For coffee farmers, the effects of participation in a VSS have been mixed. Research indicates that these standards have an overall positive impact on the prices that coffee farmers receive (Evidensia, 2020; DeFries et al., 2017). As Figure 5 shows, farmers certified under

Fairtrade and Organic can get an average of 20%–30% higher prices than their non-certified counterparts over a year (Fairtrade International, 2021; Specialty Coffee Association, 2019, p. 71; Trading Economics, 2022). Research on farm revenues also suggests that complying with a VSS across a few commodities, including coffee, translates into markedly higher crop income for farmers compared to non-compliant farms. However, effects on net household income are less explored, with more studies revealing no significant results between VSS-compliant and non-VSS-compliant farmers (Elder et al., 2019, p. 168; Evidensia, 2020; Panhuysen & Pierrot, 2020).

However, our analysis shows that VSS prices (Fairtrade, Organic) do not necessarily make a difference when farmers are already selling specialty coffee. There are also concerns about the minimum price offered by certification schemes such as Fairtrade, as it is deemed too low to cover production costs or to contribute appreciably to the overall household income (DeFries et al., 2017). It is important to recognize that an oversupply of VSS-compliant coffee means farmers may have to sell at lower conventional prices and therefore will not benefit from higher prices and premiums (Specialty Coffee Association, 2019, p. 71; Voora et al., 2019, p. 6). Imbalances in supply and demand will probably always remain because of time frame lags for production and different consumption trends.

Building from these issues, VSSs such as Fairtrade, Rainforest Alliance, and Bonsucro—alongside many other organizations that are part of the Living Income Community of Practice—have been working to develop the concept of

living income reference prices in coffee. For instance, Fairtrade released the first price reference for Colombian coffee farmers in July 2021. It aims to indicate the price needed for full-time Fairtrade farmers with adequate, sustainable productivity levels to earn a living income that gives them and their families a sustainable livelihood (Fairtrade International, 2021).

As an example, the recommended Fairtrade Living Income Reference Price for conventional coffee is COP 9,900 (about USD 2.75) per kilogram of dried parchment coffee and COP 11,000 (USD 3.06) per kilogram for Organic. These prices factor in the costs for farmers to adopt the required agricultural practices to achieve sustainable yield levels and to pay a living wage to any workers they may hire (Fairtrade International, 2021).

Other tools are also available to help coffee buyers raise the price they pay to farmers, such as the Living Income Benchmark. This tool helps users understand the difference or gap between the actual household income and a basic, decent standard of living income for a farming household for a given sector and country. When coffee buyers know the living income gap, they can define price differentials to help close it (The Living Income Community of Practice, 2021). Several coffee buyers are involved in living income initiatives, including Nestlé, Tchibo, and Keurig (Cordes et al., 2021). It remains to be seen how these measures will be applied in practice, how they will be adjusted to market dynamics (i.e., inflation and exchange rate fluctuations), and how it will affect coffee farmers if they are not applied across the board, as traders in a free-market economy

may opt to purchase coffee from farmers and countries at a lower price (Stencel, 2008).

Other actors have also put in place measures to increase farm gate prices and mitigate volatility. For instance, the governments of Rwanda and Brazil have established minimum prices for green beans considering average costs of production, minimum profit margins for farmers, and international prices (Cashin & McDermott, 2002). They buy farmers' coffee at that price when market prices fall below the minimum guaranteed price. Other governments have also set up coffee funds to alleviate the effects of low prices. For instance, Colombia has created a fund of up to USD 34 million to help coffee farmers (subsidies based on production/tonnes), and Kenya has implemented a series of legislative actions, including a USD 15 million subsidy program, to support coffee farmers affected by low international prices (FAO, 2018).

However, some studies have found that in a global market economy, commodity price shocks in the coffee sector are so long-lasting that they make mechanisms such as price stabilization schemes, buffer stocks, price ceilings and floors, and guaranteed prices unviable in the long term (Cashin & McDermott, 2002; Lewin et al., 2004). For instance, price floors may not reflect farmers' production costs in the end (Gomes & Teixeira, 2019). Experts also point out that price guarantees can encourage the overproduction of coffee and lead to debilitating prices in the long run (Gebre, 2020). They can promote inefficiency and low quality, as farmers may be reluctant to implement good practices if they have a guaranteed buyer. In addition, not all coffee-growing countries can afford to support

farmers, creating disadvantages for poorer nations (Lewin et al., 2004).

Large roasters have also established support programs for farmers—for instance, to access loans and funds, technical assistance, and training on business planning and price risk management (Starbucks Coffee Company, 2020). Other roasters and retailers are working to define living income reference prices or trading directly to pay higher prices to coffee farmers. There are examples of roasters involved in direct trade that have bought high-quality coffee for a price that is 25% to 30% above the Fair Trade and Organic combined price (Oden, 2021).

However, these measures do not necessarily mean a proportional increase in the price the individual farmer, farmworkers, and others obtain (Rogers, 2019). In practice, the use and distribution among farmers of premiums or higher prices paid by these specialty buyers and direct traders is not usually verified or monitored (Baptista & Jenkins, 2017, p. 32; Nordic Approach, n.d.).

A way forward: Increasing farm prices and sharing value to build sustainable and resilient coffee systems

Despite the efforts of VSSs, private sector actors, and governments in producing countries to provide farmers better incomes and mitigate their vulnerability in a volatile market, in the current free-market economy we live in and with a highly competitive sector, the effects of these initiatives alone have been temporary (excluding the living

income reference price benchmarks that require further use and analysis). They also have had little impact in terms of defining and maintaining fair prices for farmers in the long run that reward them for facing risks, sustaining a wealthy value chain, and adopting good social and environmental practices. In other words, there is a need to share financial gains with farmers for the societal value and benefits they create by implementing sustainable practices.

Tackling the recurring cycle of a brief period of high coffee prices followed by an extended period of low prices will require coordinated actions from many actors. What is most needed is not market intervention but rather market cooperation among exporters, with the involvement of importers (Amrouk, 2018; Bellweather Coffee, n.d.), and governments in producing and consuming countries and VSSs to ensure that the global coffee market protects the livelihoods of millions of smallholder producers. Actors along the chain can put the following measures in place to help farmers get better prices and greater value for their VSS-compliant coffee.

Promote value addition and more efficient and resilient production systems. Governments in producing and consuming countries, buyers, exporters, extension service providers, and standard-setting bodies can collaborate to help farmers produce and maintain high-quality coffee beans, as farmers can negotiate better prices even if they comply with VSSs. They can also support farmers' groups in investing in roasting facilities when coffee is consumed locally or in neighbouring markets (i.e., urban centres) as they can obtain higher prices and margins for roasted coffee. Farmers can leverage voluntary standards when the market

demands VSS-compliant coffee, and these supporting actors can help them in different ways to comply and maintain certification (Elder et al., 2021, p. 168).

Jointly, these actors can also support farmers in adopting more efficient and diversified production systems that can help them to remain competitive when coffee prices are depressed and generate other revenue streams—for instance, by maintaining records of inputs used, costs, and yields; incorporating technology and equipment when appropriate and maintaining it well; and helping farmers cultivate other crops or engage in off-farm employment. They can also help farmers build resilience to climate change by maintaining good soil quality, capturing rainwater, and adopting agroforestry. VSSs can use the training and monitoring activities they conduct with farmers to improve their production efficiency and adaptation capabilities.

Increase demand for VSS-compliant coffee in producing countries. Stimulating demand in producing countries is considered an effective way to increase prices in the coffee sector. According to the FAO (2018), the greatest impact on coffee prices would come from actions designed to control coffee production and/or stimulate demand. This is particularly relevant for VSS-compliant coffee to balance the existing oversupply and support farmers in obtaining higher prices for their coffee that reflect sustainability investments and external benefits.

Governments in producing countries can play this role by collaborating with roasters, coffee shops, retailers, and VSSs via education and awareness-raising campaigns and promotional activities. Governments can also help define accounting methods that internalize the social

and environmental costs of growing coffee typically borne by society, which should be reflected in the prices paid to producers and, ultimately, the final price the consumer pays. This can support raising the competitiveness of VSS-compliant coffee and increase demand.

Governments, traders, standard-setting bodies, and extension services can support farmers and farmer groups in producing VSS-compliant coffee by establishing direct and personal relationships with roasters in importing countries. This could help in understanding the value of cultivating coffee sustainably and the challenges farmers face and determine prices that adequately reflect sustainability investments by farmers. This could be done by developing/using “direct trade” digital platforms and e-commerce channels. VSSs can encourage compliant farmers to use these channels and to develop branding and messaging to communicate the environmental, economic, and social benefits of producing coffee that complies with VSSs when engaging with buyers.

Reward farmers for managing risks (i.e., production, market, climate), applying sustainable production practices and environmental stewardship, and achieving positive results. Governments in producing countries have also started to reward coffee farmers for their actions and positive results obtained in protecting the environment. For instance, the Indonesian government, with the support of a large coffee buyer, partnered with the non-governmental organization Rikolto to create a payment for ecosystem services model in Jambi, one of the most deforested regions of Indonesia. It is seen as a cost-effective way to compensate farmers and Indigenous communities for their environmental maintenance and provision of

ecosystem services. These payments can be monetary or in-kind through the provision of training, investments in infrastructure, and others (Goossens, 2020).

Governments can also reward coffee farmers for reducing and capturing carbon emissions, as they contribute to achieving nationally determined contributions as part of the Paris Agreement. For instance, the European Commission plans to reward farmers in its jurisdiction for removing carbon by implementing sustainable agricultural practices, such as forest conservation, agroforestry, or restoration of peatlands, that are verified with a given methodology (Climate Action, n.d.; Taylor, 2022).

Governments from other jurisdictions can also adopt these types of measures as a way to create value for using more sustainable agricultural practices in coffee production.

Private sector actors also have a responsibility to reward farmers for adopting sustainable agricultural practices that yield positive results and share the cost of using and maintaining these practices. Some companies (i.e., Indigo Agriculture) are working to offer farmers financial incentives to implement regenerative practices to capture atmospheric carbon dioxide (CO₂) from agricultural soil and using digital innovations such as software imagery analysis to measure and

Private sector actors also have a responsibility to reward farmers for adopting sustainable agricultural practices that yield positive results and share the cost of using and maintaining these practices.

verify data related to carbon sequestered in farms (Indigo Ag, n.d.; Ioannou, 2019). Along this line, Rainforest Alliance has defined the concept of sustainability investments in its new Sustainable Agricultural Standard Certification Program. These are mandatory or in-kind investments that buyers of compliant goods must give to certified producers to help them meet the farm requirements of the standard. These kinds of initiatives can also help private sector actors comply with reporting and due diligence requirements such as those the EU or the Supply Chain Act in Germany defines. These requirements impose obligations on companies that source their products from developing and emerging economies to comply with human rights and environmental standards (Sharma & Kaps, 2021).

VSSs would need to align with these approaches, including by integrating performance metrics in their scheme, which can help value chain actors comply with the specifics of these regulations. Furthermore, VSSs can also help farmers use technology to facilitate the collection and reporting of related data (i.e., volume of CO₂ emissions reduced, removed; reforested area in a given period), provide supporting evidence, and implement more robust verification and assurance systems of VSS-compliant practices.

Offering financing such as loans and blended finance linked to sustainability performance can be a way to reward farmers and promote access to finance in coffee-producing communities (Voora et al., 2022, p. 208). Some leading businesses already implement such mechanisms. For example, BNP Paribas teamed with Neumann Kaffe Gruppe in 2019 to establish a EUR 25 million loan facility to support more than 100,000 coffee farmers

in 10 countries and offer them sustainability training and resources (BusinessGreen, 2019). Another example is the Mercon Group, which offers coffee farmers sustainability-linked loans coupled with technical assistance. Loan interest rates are linked to sustainability results, which are measured using an index aligned with Rainforest Alliance criteria (Voora et al., 2022). VSSs can collaborate with governments and financial service providers to define these measures and inform the performance indicators used to monitor the progress of farmers in achieving positive environmental results (Voora et al., 2022).

Promote an enabling institutional environment. The better the institutional environment, the fairer the prices paid to coffee farmers (Lerner et al., 2021). This includes governments of producing countries investing in infrastructure and better access to ports and roads, as well as electricity and communications. Countries with organized coffee associations can better protect farmers from volatile prices in the global market. For instance, the Coffee Institute of Costa Rica (ICAFFE) has the authority to reject a coffee transaction between a buyer and a seller when, for example, it considers the price to be too low.

Require price transparency in coffee transactions. Encouraging transparency in prices and coffee transactions is vital. Roasters and buyers can ask for or invest in mechanisms that can trace the coffee back to its origin and disclose the prices paid to the farmer. This will help coffee roasters understand the destination of the premiums they pay and act to ensure that farmers receive those premiums. VSSs can also help to make coffee prices transparent. One example

is Fairtrade's pricing table, which shows the minimum prices of conventional, Organic, and Fairtrade prices as well as the premium (Fairtrade International, n.d.). Governments can also use mechanisms to better map and analyze production costs. Knowing these costs will give buyers and roasters an objective way to determine the FOB prices, guaranteeing a minimum level of profitability for their farmer partners (Cadena, 2019, p. 13) and ensuring long-term viability.

Building sustainable and resilient coffee production systems is critical. It requires industry actors to coordinate to ensure that farmers have the conditions needed to adopt more sustainable practices and that they are rewarded fairly. The measures that VSSs implement can help to boost coffee prices and farmers' incomes. However, many others are needed to ensure that different aspects of farming operations, value chain dynamics, market demand, and an institutional environment are favourable to support the continued expansion of sustainable coffee production and consumption by rewarding farmers fairly.

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The Sustainable Commodities Marketplace Series provides a market performance overview and outlook for key agricultural commodities that comply with a number of voluntary sustainability standards (VSSs), focusing on global sustainable consumption and production. Each year, the series focuses on a different overarching theme, with individual reports for that year devoted to providing a market update for a chosen commodity. These reports are designed to be accessible and relevant for a range of audiences, including supply chain decision makers, procurement officers, policy-makers and producers. The series builds on *The State of Sustainable Markets 2021*, a joint publication from IISD, the International Trade Center (ITC), and the Research Institute of Organic Agriculture (FiBL), which examines over a dozen sustainability standards for various commodities.

The *Global Market Report* analyzes trends in coffee production, consumption, trade flows, and other relevant areas. It uses 2019 data for coffee production that is VSS-compliant, given that this was the most current data available when we conducted the analysis. The report also examines prices and margins in the coffee sector, looking at how VSSs contribute to increasing farm prices. It also provides recommendations to VSSs and other actors to increase the price and income that farmers obtain for their coffee and build sustainable and resilient coffee systems.

IISD's State of Sustainability Initiatives (SSI) is an international research project that aims to advance sustainable and inclusive value chains. For over a decade, the SSI has been providing credible and solution-oriented analysis and dialogue on voluntary sustainability standards (VSSs) and their potential to contribute to sustainable development outcomes.

Steffany Bermudez and Vivek Voora are both first authors of this report. Steffany Bermudez worked on coffee prices and examining sustainable consumption preferences in developing countries in the market overview section. Vivek Voora worked on the market overview section examining supply and demand dynamics, production trends and forecasting, yields and climate resilience in sustainable coffee production.

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