



# Can COVID-19 Melt the Craft Chocolate Industry?

Jeana Cadby<sup>1</sup>

Accepted: 7 April 2021/Published online: 27 April 2021  
© The Author(s), under exclusive licence to Springer Nature Switzerland AG 2021

## Abstract

The craft chocolate and specialty cacao industry has been driving the global chocolate industry towards more sustainable farming and ethical and transparent sourcing practices by prioritizing farmer welfare, environmental resource conservation, and consumer education. However, the craft chocolate and specialty cacao industries are also uniquely vulnerable to the immediate and long term impacts of the COVID-19 pandemic, and many cacao producers are expected to be disproportionately affected. Craft chocolate businesses have been especially hard hit by losses in revenue and specialty cacao producers are facing unique challenges compared to their industrial counterparts. Factors that influence the future of these businesses include: labor intensity, regional politics, risk tolerance, and accessibility. Immediate impacts include loss of revenue and access to markets, which are directly influenced by travel restrictions, access to petrol, global trade networks, and operational limitations. Long term impacts include changes in business strategies, including the use of e-commerce, elevating consumer education to sustain sales and providing access to transparent pricing. The global crisis reveals that there is an ethical imperative to provide investments in the specialty cacao and craft chocolate industry to deliver farmer relief, improve access to technology for business needs, and support farmer empowerment in negotiations to mitigate risks.

**Keywords** Craft chocolate · Specialty cacao · COVID-19 · Latin America · Chocolate

## Introduction

At times it feels as if the world has come to a standstill. A cataclysmic transformation for the global system has forever changed the way humans operate and envision ‘business as usual’. The COVID-19 pandemic affects all segments of the population, and is particularly detrimental to already vulnerable groups, including people living in poverty, older persons, persons

---

✉ Jeana Cadby  
jcadby@g.ecc.u-tokyo.ac.jp

<sup>1</sup> Department of Global Agricultural Sciences, Graduate School of Agricultural and Life Sciences, The University of Tokyo, 1-1-1, Yayoi, Bunkyo Ward, Tokyo 113-8657, Japan

with disabilities, youth, and indigenous peoples. Additionally, the social crisis created by the COVID-19 pandemic has the means to increase existing and burgeoning inequalities, exclusion, discrimination and global unemployment in the long term (UN DESA 2020).

The United Nations World Food Programme estimates that an additional 130 million people could face acute food insecurity by the end of 2020, due to the global crisis brought on by the COVID-19 pandemic (WFP 2020). Although the non-immediate impacts are still unknown, many cacao producers are located in food security “hot spots” and are expected to be disproportionately affected (Table 1). Cacao is a major agricultural crop, supported by millions of smallholder farmers around the globe, often living under the poverty line, faced with a highly volatile market, and with few options for alternative income streams.

Craft chocolate, also known as fine, flavor, specialty, artisan, or premium chocolate, is recognizable by high flavor attributes, quality, and origin specificity of the cacao utilized. The craft chocolate industry is made up of many small businesses that prioritize farmer welfare and environmental resource conservation, often practicing direct trade to source high-quality specialty cacao beans (Gallo et al. 2018).

Through sustainable business models and customer education, craft chocolate is well-positioned to propel the global chocolate industry to be more accountable, transparent, and ethical. Specialty cacao, also called fine, craft, flavor, or premium cacao, used for craft chocolate production, hardly constitutes a dent in the global supply chain, making up less than 5% of total cacao production (FCIA 2019; Daniels et al. 2012). However, traditionally “non-craft” organizations have taken interest in participating in premium or bean to bar chocolate production made from specialty cacao beans, likely due to growing social awareness and consumer demand for chocolate products that have been sustainably and ethically produced. This industry metamorphosis, influenced by the focus on ethical priorities that can have multidimensional impacts to support future sustainable development for cacao producing regions, shows how the craft chocolate industry is moving the needle for the chocolate industry as a whole. The growing craft chocolate and specialty cacao industry is pioneering a more sustainable agricultural supply chain largely driven by consumer preferences for high quality food experiences and sustainable, ethical food sourcing.

Beans traded as specialty cacao are typically recognized by high flavor attributes, aesthetic and physical qualities, genetics, and origin specificity (Giller 2017; Díaz-Montenegro et al. 2018), and market prices are highly variable, typically determined by the origin, product quality, certification status, personal relationships, and demand. Specialty cacao beans are generally destined for use in craft chocolate production and traded directly, commanding a significantly higher price per ton compared to commodity cacao (Daniels et al. 2012).

**Table 1** Global Food Security Index for fine and commodity cacao producing countries and two major cacao importing countries for reference in December 2019 (GFSI 2020)

Origin	GFSI	Primary Production
Ivory Coast	62.4	Commodity
Ghana	62.8	Commodity
Ecuador	61.8	Fine
Dominican Republic	64.2	Fine
Peru	63.3	Fine
Venezuela	31.2	Fine
Japan	76.5	–
United States	83.7	–

During the food price crisis of 2007–08, which resulted in global food prices rising 50% on average, high food prices became especially problematic for those with already limited incomes. Global agricultural supply chains, increasingly controlled by the private sector, were characterized by heightened corporate concentration and based on specialized, industrial food production for global markets. The consolidated power of large transnational agribusiness firms revealed new vulnerabilities and cemented the model of the global agrifood supply chain, based on commodity production and trade, weakening land rights for the world's most vulnerable food producers (Clapp and Moseley 2020), a circumstance reminiscent of the current global cacao supply chain.

The COVID-19 pandemic is more complex than previous food crises in that it is not characterized by a sudden rise in food prices or food shortages, but rather an abrupt shock to entangled food systems that further exacerbated multiple issues such as unstable food supply chains, job losses, and highly uneven food price dynamics (Clapp and Moseley 2020). Especially in food-insecure regions, where the pandemic has taken a significant toll, accelerating interventions that provide cacao producers with the necessary resources to overcome these shocks becomes ethically imperative.

A recent report by the High-Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security called for comprehensive policy reforms to build food system resilience, including promoting agroecology and shorter agricultural supply chains (HLPE 2020), a core trade model of craft chocolate and specialty cacao industry. Additionally, the incorporation of extensive biodiversity of food and agriculture into food systems may also facilitate agroecological resilience to include stabilizing yield, insuring against extreme weather, and generally promoting agroecosystem sustainability, as seen in some South American countries such as Colombia, Ecuador, Peru, and Bolivia (Zimmerer and de Hann 2020), yet another tenant of the craft chocolate and specialty cacao industry.

The shortened supply chain trade model of the craft chocolate and specialty cacao industry and pointed ethical emphasis on farmer welfare through augmented farmgate pricing strategies and targeted diversification of agroecosystems are an example of how this industry may contribute to future food security approaches for cacao producing regions impacted by the COVID-19 pandemic.

However, the craft chocolate and specialty cacao industries are also uniquely vulnerable to the immediate and long term impacts of the COVID-19 pandemic, and ultimately, farmers producing cacao and craft chocolate makers manufacturing chocolate are making strategic business decisions that may be influenced by the following factors: labor intensity, regional politics, risk tolerance, and accessibility.

## **Major Factors Influencing the Craft Chocolate Industry**

### **Labor Intensity**

Craft chocolate is defined as “superior products made from premium chocolate and natural ingredients” (HCP 2019). In order to achieve this level of quality, craft chocolate makers and specialty cacao buyers often utilize an alternative model of direct trade to source higher-quality ingredients directly from origin. With direct trade, buyers can build relationships with specific producers to add depth to their products, through marketing unique producer stories, and facilitate deeper involvement in production, including providing oversight and resources to growers, education and communication particularly with low-tech producers, and closer

monitoring of the entire process (from bean to bar). Despite growing domestic markets in specialty cacao origin countries, the current mature markets and networks for craft chocolate products dominate in non-producing countries. Direct sourcing for international collaborations often requires travel to the beans' origin, a practice that essentially came to an abrupt halt with international and domestic travel restrictions due to the COVID-19 pandemic, which effectively removed a major quality control and communication channel. Not only did international communication and networking suffer from the lack of mobility, but the availability of supplies and local labor also challenged the production chain.

Craft chocolate businesses have experienced significant losses in access to markets throughout the COVID-19 pandemic. Additionally, specialty cacao production systems that support sustainable farming practices such as diverse agroforestry systems and growing traditionally fine flavor cacao varieties, which characteristically display lower yield and higher disease susceptibility, substantiate a higher cost of production (Bentley et al. 2004). Farmers growing specialty cacao may find the risks associated with foreseeable reduced demand for specialty cacao to be too high, leading to a transition into commodity cacao markets. Surveys have identified that, historically, farmers in Ecuador may be less willing to invest in specialty cacao production due to constraints along the marketing chain (Díaz-Montenegro et al. 2018), and may prefer to transition to high yielding, nonaromatic commodity cacao, grown in monocultured full sun to maximize yields and short-term economic gain.

Maintaining crops and implementing post-harvest practices for specialty cacao production requires investments in labor force and capital that may not be feasible for many farmers, especially through challenges that arise due to the COVID-19 pandemic. This includes navigating the unique direct sourcing distribution chain with limited support from specialty cacao buyers, transitioning to commodity cacao markets while maintaining infrastructure with fine flavor variety, lower yielding trees, and sustaining postharvest production practices necessary to meet specialty cacao quality standards.

The significance of postharvest production cannot be overlooked in terms of importance for the quality of specialty cacao, and strategies and quality expectations must be better communicated. In fact, postharvest practices are thought to be more effective for fetching higher prices for producers than the variety of cacao produced (Villacis et al. 2020). However, access to markets as well as incentives for producers to come to the table and participate in the sustainable development of this industry are lacking.

Additionally, the labor investment to produce craft chocolate is also much higher than that of industrial chocolate, due to craft chocolate makers operating on a much smaller scale, with diverse flavor batches and high attention to detail. Significant use of manual labor to perform tasks that would otherwise be automated or accomplished at a larger scale in industrial chocolate systems also add to the total cost of production. As a perishable product, the substantial upfront investment in the labor force and capital for craft chocolate exposes the vulnerabilities of this industry in the immediate and long term.

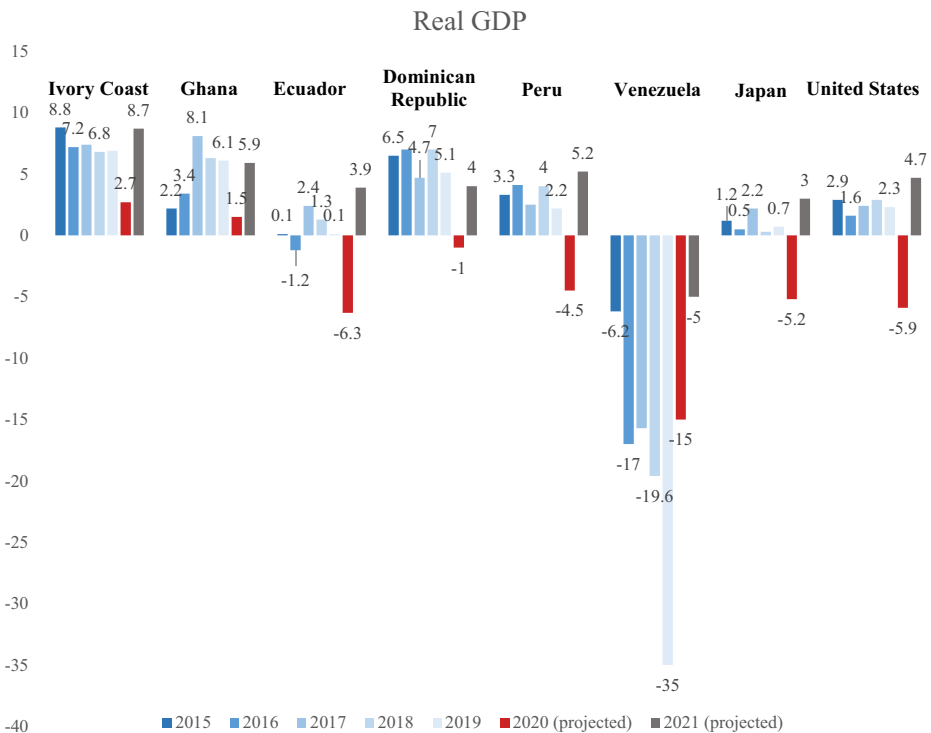
## Regional Politics

Commodity cacao used for industrial chocolate manufacturing is primarily sourced from Ghana and the Ivory Coast, with West Africa responsible for over 60% of global cacao production (Bymolt et al. 2018). However, specialty cacao used for craft chocolate production is primarily sourced from Ecuador, Venezuela, Peru, and the Dominican Republic (Cadby and Araki 2021), although these generalizations are not mutually exclusive. In addition to these

regions differing in local challenges, culture, geography, and global perceptions within the craft chocolate market, the support systems in Central and South American countries are not united by such large and globally integrated cacao specific governmental oversight groups such as Ivory Coast’s Coffee and Cocoa Council (CCC) and the Ghana Cocoa Board (COCOBOD). Furthermore, previous experience in dealing with regional epidemics such as outbreaks caused by the Ebola Virus Disease may have prepared Western Africa’s major cacao producing countries to better deal with the COVID-19 pandemic (fig. 1), although the effects will become more visible and tangible over the next few months (World Bank 2020).

Logistics and distribution systems were already known to be difficult pre-pandemic, and government-mandated road closures and travel restrictions have intensified in many cacao-producing countries, including accessibility to affordable petrol. With direct trade practices, specialty cacao buyers operating without an intermediary must navigate the challenges associated with changing distribution and export restrictions for each individual supplier. Additionally, Latin America is expected to experience significant food insecurity in the coming months (FAO 2020a, b) further impacting the stability of these markets, and governments may continue to place additional restrictions on the movement of seasonal workers.

The COVID-19 pandemic reaching Latin America has taken a significant toll both in human and economic terms to include decelerated economic growth leading to a reduction in trade and an increase in poverty. By the end of September, the region had 28% of global cases and 34% of global deaths (Pienknagura et al. 2020), and Latin American and Caribbean cacao exports dropped 16% since last year (FAO 2020a, b). Brazil, Peru, and Ecuador report some of



**Fig. 1** Historical and projected GDP for major cacao producing countries and two major cacao importing countries for reference (IMF 2020)

the highest COVID-19 rates of incidence and deaths in the region, and these countries also face synergistic threats from multiple infectious diseases. As a consequence, the regional effects of the pandemic play a significant role in the long term impacts on the global specialty cacao industry as a whole, where local challenges, culture, geography, and global perceptions within the specialty cacao and craft chocolate industry will inevitably influence outcomes.

## Risk Tolerance

Over the past 100 years, global trade has accelerated and global economies have become more intertwined and reliant on trade partners. Specialty cacao producers are already facing uncertainty for export sales in the short term, with buyers asking to renegotiate existing contracts, and in the long term, with buyers potentially going out of business or waiting to recoup costs before making additional purchases. Producers may also be expected to bear the risks of quality issues that may arise from delays during transportation. The higher standards for quality in craft chocolate production require considerably more diligence in maintaining control throughout the entire value chain, with some chocolate makers rejecting 94% of the beans sampled for craft chocolate production (Chuang, 2020). With the average imported volume of specialty cacao already much smaller than commodity cacao systems, shipments may need to wait longer with transportation restrictions and supply chain interruptions. Shipments awaiting travel to their final destination under poor storage conditions through port closures may prove to be yet another uncontrolled factor in specialty cacao quality, and it is not clear who will take on the responsibility for those potential losses (Tröster and Küblböck 2020).

The craft chocolate industry is made up of many small businesses that may not be equipped to rapidly transition to e-commerce strategies that allow for no-contact sales amidst the COVID-19 pandemic. Additionally, many craft chocolate businesses utilize Associative Sustainable Business Models (Gallo et al. 2018) and operate with narrow margins that cannot accommodate the substantial loss of revenue. Specialty cacao buyers often operate on private contracts that may be difficult to honor with decreased revenue from loss of craft chocolate sales. Loss of operations for these businesses would equate to a loss of buyers for farmers that may not be prepared to quickly find and negotiate new contracts with specialty cacao buyers at comparable prices.

## Accessibility

The craft chocolate industry has historically been reliant on industry events such as craft chocolate festivals and markets to reach customers. This is in part due to the customer education component of craft chocolate sales, which often relies on marketing the cacao origins (farm, country, or cru), and demonstrating quality or value with samples or rapport. In addition, this industry is largely driven by consumer preferences for high quality food experiences and sustainable, ethical food sourcing, and industry events provide a platform to reach this niche audience. The reduction of inter and intranational travel and non-essential farm visits may also contribute to a slower return to business, and many of these farm visits function as an essential branding tool.

The specialty cacao industry also uniquely interfaces with and facilitates business opportunities for less accessible communities, such as indigenous tribes in the South American Amazon. Craft chocolate makers that source specialty cacao from indigenous communities may be impacted, unable to access raw materials, or face challenges in communication. Indigenous communities that produce specialty cacao have historically experienced disproportionate inequalities that may be

exacerbated by the COVID-19 pandemic, including limited access to information, medical resources, and technology.

Craft chocolate makers that relied heavily on foot traffic to frequent their brick and mortar businesses saw a rapid decline in sales due to mandatory stay at home orders. Many craft chocolate makers were also benefiting from partnerships with hotels and airport shops, which saw a rapid decline in clientele due to reductions in tourism and travel. Some of these small businesses are also poorly equipped to rapidly transition to online platforms and may find it difficult to reach customers in the short term.

## Discussion

### Industry Strengths

The existing system of networks to maintain transparency of the supply chain and prices offered in commodity cacao production is not adequate to address the ethical and sustainability issues that are well known throughout this industry (Thorlakson 2018). In contrast, specialty cacao buyers have done well to encourage transparency and accountability systems, including publishing annual sourcing reports and which describe on-farm production practices, highlight farmer profiles, and divulge prices paid to farmers for specialty cacao. Due to the nature of direct sourcing strategies, these personal relationships have facilitated communication channels, including on health messaging to farmers and through farmer networks such as grower cooperatives and allow for more flexibility when forming buying contracts.

Following in the footsteps of third-wave coffee industry members, who also offer a specialty product targeted to a quality-sensitive segment of consumers, the craft chocolate industry has the potential to launch initiatives that would better support the long term success of specialty cacao producers, by taking on the burden of higher potential risks. With the uncertainty regarding whether or not buyers will follow through with existing contracts or seek future purchases, specialty cacao buyers capable of offering cacao producers more robust contracts that guarantee sales and allow for more flexibility in terms of quality to accommodate for issues that may occur along the supply chain may also want to consider that option.

Furthermore, programs that support online communication and sales opportunities for craft chocolate producers to generate online outreach mechanisms for craft chocolate businesses and for farmers to access to independent, unbiased, and objective farmer-driven information on price transparency, market averages, and quality grading systems are necessary. This kind of industry support is critical for long term survival.

Craft chocolate makers impart a strong focus on craftsmanship, social responsibility, and transparency, which has highlighted the negative social and environmental impacts of chocolate production and propelled the industry to more urgently address these challenges. This includes improved price premiums offered to farmers for specialty cacao, resulting in an increased share of revenue for farmers (Daniels et al. 2012; ICCO 2019); product production that uses perceived higher quality and traditional ingredients that align with the values of consumers; and reporting that ensures that crops, sourcing, and methodology are more sustainable (Jewett 2017). Large industrial chocolate producers now face increasing pressure to issue various corporate sustainability efforts, as shown by Hershey, Mars, Ferrero and Cloetta, and Nestle USA committing to sourcing 100% of their cacao from certified sustainable

suppliers by the year 2020 (Krauss 2017) as a result of changing consumer demands. Whether or not these commitments have been met to date is equivocal.

Additionally, such large industrial chocolate producers have also expressed interest in venturing into the production of premium chocolate using specialty cacao, including, most recently, Olam with Twenty Degrees Cacao, and Meiji's 'THE' chocolate line, along with others to join early adopters such as Hershey's with the acquisition of Scharffen Berger in 2005 (Daniels et al. 2012). This industry movement may allow smallholder farmers producing specialty cacao to participate in these new value chains (Blare et al. 2021). The potential new markets for specialty cacao beans appear promising as long as these major industry players continue to practice the tenets of prioritizing sustainable development, including investments in social and environmental welfare, and particularly in regard to demanding gender, racial, and social equality across the board.

As industrial chocolate manufacturers move into this space, there is an ethical imperative to support specialty cacao producers responsible for the labor-intensive production at origin, who have a prominent influence on the quality of the final product, while bearing significant financial and environmental risks, with little bargaining power in the global system. Industrial chocolate producers are particularly influential on a global scale, due to their resources and market audience, and must take more responsibility to advance social, economic, and environmental welfare throughout these essential regions from which they benefit from greatly (Lalwani et al. 2018). Without these improvements, the craft chocolate industry runs the risk of becoming a high-revenue market driven by empty promises and opaque messages of consumer influence. Consumers intent on supporting impactful businesses have been misled by chocolate production companies maximizing sales without being held accountable to 'ethics-washed' marketing messages (Suphawanichleela 2017, Thorlakson 2018). Current commitments to sustainable cacao sourcing have fallen flat in meeting adequate sustainability goals, with limited verifiable data reporting and transparency surrounding environmental sustainability initiatives, adequate farmgate pricing strategies and ensuring prevailing wages for cacao producers (True Price 2018, Gibbons 2020, Fawcett and Zweben 2021).

This seemingly tenuous trajectory of the global chocolate industry to follow in the footsteps of craft chocolate, as seen by industrial chocolate manufacturers with considerably more resources investing in and marketing to consumers interested in ethically produced food products, including bean to bar, threatens to potentially capture and dominate the market, pushing out smaller craft chocolate makers, only to reinvent the rhetoric of "ethical production" based on the long tenured exploitative model of cacao production and acquisition. For this reason alone, small craft chocolate businesses leading the way for ethical developments in the chocolate industry and nible enough to quickly pivot to address contemporary issues must be supported.

Additionally, in industrial cacao systems, advancements in technological innovations to increase yield are often suggested to be a more urgent need for cacao production. However, like many other instances of advancements in the chocolate world, the craft chocolate industry will need to become more innovative with chocolate production technologies in order to become more sustainable and better support farming communities as well as compete with the cost of production of larger industrial chocolate producers.

Within the commodity cacao industry, cacao producer relief programs are often funded through grants and non-profits (WCO 2020), and an industry-wide rhetoric of mysterious and untraceable supply chains has further placed the onus of addressing the environmental and ethical concerns related to cacao production on the farmers and cacao producers



(Major 2020). Placing the burden of systemic change and risk on the most vulnerable members of the supply chain slows progress toward a more equitable and ethical food system, mitigating global poverty, and decolonizing the global cacao industry.

In an era where government support, public technical assistance, and financial resources are spread so thin, it is imperative that businesses continue to implement policies that support sustainability goals. The craft chocolate and specialty cacao industry openly claims to call attention to and allocate resources that address critical issues within the industry such as deforestation, illegal and child labor, land degradation, and ethical farmer welfare, and as such, merits special support; if this nascent specialty sector can survive the pandemic, it can continue to model possibilities for ethical chocolate.

To alleviate the burden on all cacao industry members, those with resources must urgently make changes to address these issues through comprehensive traceability and key performance metrics, in addition to data reporting and incentives that drive change. Despite recent investments from commodity cacao buyers in facilities and infrastructure, such as sustainable production tactics and certification programs, more is needed to leverage power for farmers including better farmer representation in industry investments and larger organizations taking an active role in facilitating transitions into sustainable production systems. Changes that address bottlenecks contributing to these pressing industry issues must also be properly managed through system-wide policy that encourages accountability through both governmental and private.

## Regional Epidemics

The world has not experienced a global pandemic in modern history that has disrupted trade on the same scale as the COVID-19 pandemic. Although there have been regional epidemics that have negatively impacted local trade with adverse impacts on agricultural producers, comparing resulting disruption from regional epidemics is not adequate for illustrating the lasting impacts on local craft chocolate and specialty cacao industries.

Specialty cacao is primarily produced in the South and Central American countries Ecuador, Venezuela, Peru, and the Dominican Republic. Comparisons on the impacts of recent regional epidemics, such as the Ebola outbreaks in Western Africa impacting commodity cacao production systems that function in completely distinct cultural, geographical, and political framework (Asante-Poku and van Halen 2021) in addition to scale of production, are not applicable to specialty cacao production systems in these Latin American countries and the ongoing COVID-19 pandemic. It is also difficult to infer potential impacts from regional epidemics focused on South and Central America over the last decade, including zika outbreaks in 2015–2016 (Kindhauser et al. 2016), dengue in the early 2000s, 2016, and 2019 (Dick et al. 2012; Love et al. 2017), and chikungunya in 2016 (WHO 2020).

The region is not new to epidemics and is in fact suffering concurrent outbreaks with COVID-19. For example, the ten countries currently most affected by dengue, in terms of new cases per 100,000 inhabitants, are Nicaragua, Brazil, Honduras, Belize, Colombia, El Salvador, Paraguay, Guatemala, Mexico and Venezuela (PAHO 2019). The continuous dengue epidemic in Ecuador, also concurrent with the COVID-19 pandemic, has experienced a further increase in cases and has become one of the largest dengue outbreaks in the region. The coast and the city of Guayaquil, Ecuador, simultaneously present over 82% of the confirmed cases of COVID-19 and the highest number of dengue cases (84%) in Ecuador (Navarro et al. 2020).

In Ecuador, cacao is mainly grown in the Coastal plain and Amazonia regions throughout 21 provinces, widely concentrated in the Coastal region, including Guayas (Argüello et al. 2019).

These viruses, however, are not at the global pandemic scale that has disrupted global travel and trade like the 2020 COVID-19 pandemic. For example, in January 2016, the United States issued interim travel guidance for pregnant women “out of an abundance of caution” to consider postponing travel to areas with ongoing local transmission of the Zika Virus, or to take precautions against mosquito bites if they must travel (Kindhauser et al. 2016), much less restrictive than the international travel bans seen with the COVID-19 pandemic.

Additionally, the resurgence of dengue, chikungunya, zika, and yellow fever outbreaks can be influenced by weather and climate conditions facilitating mosquito breeding habitats; these ongoing diseases spread mainly through the bite of infected *Aedes* or *Haemagogus* species mosquito, which coincidentally can breed in discarded cocoa pods. For example, predictions of El Niño-Southern Oscillation (ENSO) could correctly forecast early peaks in dengue incidence in Ecuador, with a 90% chance of exceeding the mean dengue incidence for the previous five years (Lowe et al. 2017); and in Peru, outbreaks of dengue, chikungunya, and zika are similarly associated (Ramírez and Lee 2020).

However, in terms of regional epidemics by way of the plant kingdom, perhaps an example may be found in the form of a hemibiotrophic fungus. Originating in the lower Amazon basin, witches’ broom, or ‘escoba de bruja’ is a devastating pathogen with a taste for cacao. Its reach throughout cacao producing nations has been historically damaging for industries in South and Central America, as well as the Caribbean. The first strike of witches’ broom in Suriname shattered the cacao industry in the late 1890s, sweeping out 80% of cacao production from beneath their feet. One by one, the witches broom disease turned to sink her deadly claws into Guyana, then Colombia, Ecuador, Trinidad, Tobago, Peru, Grenada, Panama, and in significant devastation, Brazil, toppling cacao producing regions like dominoes.

As the industry began to crumble under the weight of this seemingly unstoppable obliteration, farmers could either abandon cacao, struggle to survive, or wait for a miracle. Out of the ambition to give breath to a drowning industry, ‘CCN-51’ was developed by an independent plant scientist in the form of a robust, highly productive, and most importantly, disease-resistant hybrid cacao tree. These specimens were deployed to replace less disease-hardy varieties, most documented in the fine cacao producing regions of Ecuador in the late 90s. Today, many commodity chocolate products contain at least a percentage of ‘CCN-51’, which alone accounts for 36% of production in Ecuador in recent years, forever changing the landscape of specialty cacao industry. The industry was also forever changed in that cacao production in Guyana, Ecuador, Trinidad, Colombia, and Grenada were catastrophically affected with yield reductions of 50–90% (Meinhardt et al. 2008).

Pathogen-related crop losses disproportionately impact food-insecure populations, including smallholder farmers producing cacao, and cost the global economy USD 220 billion annually (He and Krainer 2020). The cycle of poverty, perpetuated by economic crises that disproportionately impact communities with fewer resources and alternative income strategies, must be broken through innovative approaches to facilitating resilient business practices, particularly along the chocolate supply chain. The sudden halt of economic activities due to the COVID-19 pandemic has led to a sharp drop in income and demand for aggregate commodities including cacao (Tröster and Küblböck 2020). This has also been witnessed in a historical context in Brazil, a major cacao producing country in Latin America, with the proliferation of poverty in the aftermath of the spread of witches’ broom’, as highlighted by Trevizan and Marques (2002), as a result of a dependence on foreign markets, concentration of

market share to few commodities buyers, unstable market prices, oversupply and undermined price control, and poor oversight and infrastructure to address the issue; quite similar to commodity cacao markets today. In this context, the lack of action to reform the existing system and address the potential impacts of devastating disease outbreaks warrant an investigation in terms of the ethical implications for economic and food security of cacao producers with limited access to alternative income options.

## Global Cacao

Currently, there is no evident shortage of cacao in the supply chain, however, it is uncertain whether specialty cacao buyers will honor pre-existing contracts or continue to patronize specialty cacao producers in the coming months, as many buyers may not be in a position to continue operations after their existing inventory runs out. Production costs are typically fixed, while prices that are tied to commodity prices can fluctuate unpredictably. Ensuring producers access to stable, transparent pricing platforms through improved access to technology for business needs, and farmer empowerment for negotiations with buyers is ethically necessary to ensure the well-deserved economic stability for these business operators.

The specialty cacao and craft chocolate industries are less researched and documented, and often rely on the commodity cacao industry to anticipate changes and impacts. The main cocoa crop for major West African producing countries does not begin until October to November, therefore the effects are expected to become more apparent in the coming months (Arrion 2020), although some news reports have already described cacao exports stalled over COVID-19 safety protocols (Awere 2020). Additionally, negative income shocks have historically to lead to increases in child labor (ICI 2020), instability in WMP is anticipated, and Ivory Coast cacao producers are already expected to experience a drop in income (CIRAD 2020).

## Conclusion

Specialty cacao producers face significant challenges and are often asked to shoulder the burden of production, maintenance of consistent quality, and reliance on buyers while wielding the least amount of leverage and resources. Specialty cacao farmers and craft chocolate businesses need better support and resources to build online platforms for sales and to improve communication. The global crisis highlights the need for investments in farmer relief, improved access to technology for business needs, and farmer empowerment for negotiations with buyers to mitigate risks. The current industry dependence on cacao producer relief programs funded through grants and non-profits and further placing the responsibility of addressing the environmental and ethical concerns related to cacao production on the farmers and cacao producers must come to an end. Furthermore, farmers should be provided with tools to better share their story and brand their products to enhance accessibility. Governmental support that aids farmers by instituting initiatives to encourage consumption, enhance markets for craft chocolate production at origin, or facilitating stimulus options for smallholder farmers can ensure the survival of the industry. Local government funding allocated to enhance accessibility to and better representation within specialty cacao markets is a start, however major chocolate consuming and cacao importing countries must also acknowledge the hidden costs behind the production of chocolate (in addition to the inherent privilege and concessions for a faster return to normalcy such as

access to vaccinations and other resources) and invest in programs that help mitigate these external costs. One such program includes the Online Cacao and Chocolate Summit (an online forum for representatives of the cacao and chocolate industry in Latin America and the US to share experiences and perspectives in the wake of the pandemic).

The craft chocolate and specialty cacao industries are uniquely vulnerable to the immediate and long term impacts of the COVID-19 pandemic. Mutual empathy can help lead to a better collective understanding of the challenges that these industries face, and opportunities to support each other in the coming months and years.

## References

- Argüello, D., Chávez, E., Laurysen, F., Vanderschueren, R., Smolders, E., and D. Montalvo. 2019. Soil properties and agronomic factors affecting cadmium concentrations in cacao beans: A nationwide survey in Ecuador. *Science of the Total Environment* 649: 120–127. <https://doi.org/10.1016/j.scitotenv.2018.08.292>.
- Arrion M. 2020. What could be the impact of Covid-19 on the global cocoa market? Cacao and Chocolate Summit. <https://cacaoandchocolatesummit.com/wp-content/uploads/2020/06/ICCO-What-could-be-the-impact-of-Covid-19-on-the-global-cocoa-market-1.pdf>
- Asante-Poku, N.A., and S. van Huellen. 2021. Commodity exporter's vulnerabilities in times of COVID-19: the case of Ghana. *Canadian Journal of Development Studies / Revue canadienne d'études du développement*. <https://doi.org/10.1080/02255189.2020.1857225>.
- Awere T. 2020. Nigeria Cocoa Exports Stalled Over Covid-19 Safety Protocols. Bloomberg News. <https://www.bloomberg.com/news/articles/2020-05-05/nigeria-cocoa-exports-stalled-over-covid-19-safety-protocols>.
- Bentley, J.W., E. Boa, and J. Stonehouse. 2004. Neighbor trees: Shade, intercropping, and cacao in Ecuador. *Human Ecology* 32 (2): 241–270. <https://doi.org/10.1023/b:huec.0000019759.46526.4d>.
- Blare, T., Corrales, I., and L. Zambrino. 2021. Can Niche Markets for Local Cacao Varieties Benefit Smallholders in Peru and Mexico? *Choices* 35(316–2021–141).
- Bymolt R, Laven, A., and M. Tyszler. 2018. Demystifying the cocoa sector in Ghana and Côte d'Ivoire. Chapter 11, Cocoa Marketing and Prices. *The Royal Tropical Institute (KIT)*. <https://www.kit.nl/wp-content/uploads/2018/12/Demystifying-cocoa-sector-chapter11-cocoa-marketing-and-prices.pdf>.
- Cadby, J., and T. Araki. 2021. Towards ethical chocolate: multicriterial identifiers, pricing structures, and the role of the specialty cacao industry in sustainable development. *SN Business & Economics* 1: 44. <https://doi.org/10.1007/s43546-021-00051-y>.
- Chuang T. 2020. A Fort Collins chocolate maker has the world's largest selection of single-origin bars, but that's not its purpose. The Colorado Sun. <https://coloradosun.com/2020/02/10/nuance-fort-collins-single-origin-chocolate-industry/>.
- CIRAD. 2020. Covid-19 and food security: Cocoa planters in Ivory Coast fear a drop in their income. Centre de coopération internationale en recherche agronomique pour le développement. <https://www.cirad.fr/en/news/all-news-items/articles/2020/science/covid-19-and-food-security-what-risks-for-ivorian-cocoa-planters>.
- Clapp, J., and W.G. Moseley. 2020. This food crisis is different: COVID-19 and the fragility of the neoliberal food security order. *The Journal of Peasant Studies* 47 (7):1393–1417. <https://doi.org/10.1080/03066150.2020.1823838>.
- Daniels, S., Läderach, P., and M. Paschall. 2012. Reaching high-value markets: fine flavor cocoa in Ghana. *New Business Models for Sustainable Trading Relationships*. International Institute for Environment and Development/Sustainable Food Lab. <https://pubs.iied.org/pdfs/16036IIED.pdf>.
- Diaz-Montenegro, J., E. Varela, and J.M. Gil. 2018. Livelihood strategies of cacao producers in Ecuador: Effects of national policies to support cacao farmers and specialty cacao landraces. *Journal of Rural Studies* 63: 141–156. <https://doi.org/10.1016/j.jrurstud.2018.08.004>.
- Dick, O.B., San Martín, J.L., Montoya, R.H., del Diego, J., Zambrano, B., and G.H. Dayan. 2012. The History of Dengue Outbreaks in the Americas. *The American Journal of Tropical Medicine and Hygiene* 87 (4): 584–593. <https://doi.org/10.4269/ajtmh.2012.11-0770>.
- FAO. 2020a. Food security under the COVID-19 pandemic. Food and Agriculture Organization. <http://www.fao.org/3/ca8873en/CA8873EN.pdf>.

- FAO. 2020b. Food systems and COVID-19 in Latin America and the Caribbean: Trade performance during the crisis. [https://repositorio.cepal.org/bitstream/handle/11362/45925/cb0583\\_en.pdf?sequence=1&isAllowed=y](https://repositorio.cepal.org/bitstream/handle/11362/45925/cb0583_en.pdf?sequence=1&isAllowed=y)
- Fawcett, E., and S. Zweben. 2021. Shining a Spotlight. *Oxfam*. <https://doi.org/10.21201/2021.7307>.
- FCIA. 2019. About Chocolate: Defining Fine Chocolate. *Fine Chocolate Industry Association*. <https://www.finechocolateindustry.org/differentiate>
- Gallo, P., R. Antolin-Lopez, and I. Montiel. 2018. Associative sustainable business models: Cases in the bean-to-bar chocolate industry. *Journal of Cleaner Production* 174: 905–916. <https://doi.org/10.1016/j.jclepro.2017.11.021>.
- GFSI. 2020. Rankings and Trends. *Global Food Security Index*. <https://foodsecurityindex.eiu.com/index>.
- Gibbons O. 2020. Chocolate industry: The effects of consumer preferences on bean-to-bar chocolate producers. B Bachelor Project submitted for the degree of Bachelor of Science HES in International Business Management. [https://www.chocolatsdumonde.ch/wp-content/uploads/TBIBM\\_2020\\_Gibbons\\_Oscar.pdf](https://www.chocolatsdumonde.ch/wp-content/uploads/TBIBM_2020_Gibbons_Oscar.pdf).
- Giller, M. 2017. *Bean-to-bar chocolate: America's craft chocolate revolution: the origins, the makers, and the mind-blowing flavors*. North Adams: Storey Publishing.
- HCP. 2019. About the Heirloom Cacao Preservation Fund. *HCP Blog*. <https://hccacao.org/abouthcp/>. Accessed 24 July 2019.
- He, S., and K.C. Krainer. 2020. Pandemics of People and Plants: Which Is the Greater Threat to Food Security? *Molecular Plant* 13 (7): 933–934. <https://doi.org/10.1016/j.molp.2020.06.007>.
- HLPE. 2020. Food security and nutrition: Building a global narrative towards 2030. Report #15. *High level panel of experts (HLPE) on food security and nutrition, committee on world food security*. <http://www.fao.org/3/ca9731en/ca9731en.pdf>.
- ICCO. 2019. *Fine or Flavour Cocoa*. <https://www.icco.org/about-cocoa/fine-or-flavour-cocoa.html>.
- ICI. 2020. Hazardous child labour in Côte d'Ivoire's cocoa communities during COVID-19. *International Cocoa Initiative*. [https://cocoainitiative.org/wp-content/uploads/2020/07/ICI\\_rapid-analysis-covid-impact-child-labour-identification\\_1July2020.pdf](https://cocoainitiative.org/wp-content/uploads/2020/07/ICI_rapid-analysis-covid-impact-child-labour-identification_1July2020.pdf).
- IMF. 2020. The Great Lockdown. *World Economic Outlook International Monetary Fund*. <https://www.imf.org/en/Publications/WEO/Issues/2020/04/14/weo-april-2020>.
- Jewett, S. 2017. Artisan chocolate making. In: Beckett's Industrial Chocolate Manufacture and Use, eds. S.T. Beckett, M.S. Fowler, and G.R. Ziegler, 456–478. Chichester, West Sussex: John Wiley & Sons.
- Kindhauser, M.K., Allen, T., Frank ,V., Santhana, S., and C. Dye. 2016. Zika: the origin and spread of a mosquito-borne virus. *Bulletin of the World Health Organization* 94 (9): 675–686C. <https://doi.org/10.2471/BLT.16.171082>.
- Krauss, J. 2017. What is cocoa sustainability? Mapping stakeholders' socio-economic, environmental, and commercial constellations of priorities. *EDM* 28 (3): 228–250. <https://doi.org/10.3362/1755-1986.17-000JK>.
- Lalwani, S.K., Nunes, B., Chicksand, D., and D.K. Boojhawon. 2018. Benchmarking self-declared social sustainability initiatives in cocoa sourcing. *Benchmarking: An International Journal* 25 (9): 3986–4008. <https://doi.org/10.1108/BIJ-07-2017-0186>.
- Lowe, R., A.M. Stewart-Ibarra, D. Petrova, M. García-Díez, M.J. Borbor-Cordova, R. Mejía, M. Regato, and X. Rodó. 2017. Climate services for health: Predicting the evolution of the 2016 dengue season in Machala, Ecuador. *The Lancet Planetary Health* 1 (4): E142–E151. [https://doi.org/10.1016/S2542-5196\(17\)30064-5](https://doi.org/10.1016/S2542-5196(17)30064-5).
- Major R. 2020. Cocoa- a Dr. Jeckyll and Mr. Hyde story. *Drexel University: Sustainability at Work*. [https://drexel.zoom.us/jcX2yDj9MdpP25MBQT18rCPPeDQnJitytkbV4z0-SoWvn3Km3JxRvH4tw-Hc5jZsifJwvSYA9rZQHHzHr.UcoDRfNzzg1xPd-Y?continueMode=true&\\_x\\_zm\\_rtaid=HrrWVUjjTZODrHcaCiMsbg.1606600259895.841fe8cc4d6bd6c8346d58ba8e265c2&\\_x\\_zm\\_rhtaid=882](https://drexel.zoom.us/jcX2yDj9MdpP25MBQT18rCPPeDQnJitytkbV4z0-SoWvn3Km3JxRvH4tw-Hc5jZsifJwvSYA9rZQHHzHr.UcoDRfNzzg1xPd-Y?continueMode=true&_x_zm_rtaid=HrrWVUjjTZODrHcaCiMsbg.1606600259895.841fe8cc4d6bd6c8346d58ba8e265c2&_x_zm_rhtaid=882).
- Meinhardt, L.W., J. Rincones, B.A. Bailey, M.C. Aime, G.W. Griffith, D. Zhang, and G.A. Pereira. 2008. *Monilophthora perniciosa*, the causal agent of witches' broom disease of cacao: What's new from this old foe? *Molecular Plant Pathology* 9 (5): 577–588.
- Navarro, J.C., J. Arrivillaga-Henríquez, J. Salazar-Loor, and A.J. Rodríguez-Morales. 2020. COVID-19 and dengue, co-epidemics in Ecuador and other countries in Latin America: Pushing strained health care systems over the edge. *Travel Medicine and Infectious Disease* 37: 101656. <https://doi.org/10.1016/j.tmaid.2020.101656>.
- PAHO. 2019. PAHO warns of the complex situation of dengue in Latin America and the Caribbean. *Pan American Health Organization*. [https://www.paho.org/hq/index.php?option=com\\_content&view=article&id=15365:paho-warns-of-the-complex-situation-of-dengue-in-latin-america-and-the-caribbean&Itemid=135&lang=en](https://www.paho.org/hq/index.php?option=com_content&view=article&id=15365:paho-warns-of-the-complex-situation-of-dengue-in-latin-america-and-the-caribbean&Itemid=135&lang=en).
- Pienknagura, S., Roldós, J., and A. Werner. 2020. Pandemic Persistence Clouds Latin America and Caribbean Recovery. *International Monetary Fund*. <https://blogs.imf.org/2020/10/22/pandemic-persistence-clouds-latin-america-and-caribbean-recovery/>.

- Ramírez, I.J., and J. Lee. 2020. COVID-19 and Ecosyndemic vulnerability: Implications for El Niño-sensitive countries in Latin America. *International Journal of Disaster Risk Science* 12:147–156. <https://doi.org/10.1007/s13753-020-00318-2>.
- Suphawanichleela S. 2017. Crafting the virtual self: A netnographic study of artisan chocolate consumption practices on Instagram. Master's thesis, Lund University, Department of Service Management and Service Studies. <http://lup.lub.lu.se/luur/download?func=downloadFile&recordId=8921572&fileId=8921573>.
- Thorlakson, T. 2018. A move beyond sustainability certification: The evolution of the chocolate industry's sustainable sourcing practices. *Business Strategy and the Environment* 27 (8): 1653–1665. <https://doi.org/10.1002/bse.2230>.
- Trevizan, S.D.P., and M. Marques. 2002. Impactos socioeconomicos da crise do cacau: um estudo de comunidade-caso. *Agrotropica* 14: 127–36.
- Tröster, B., and K. Küblböck. 2020. Unprecedented but not unpredictable: Effects of the COVID-19 crisis on commodity-dependent countries. *European Journal of Development Research* 32: 1430–1449. <https://doi.org/10.1057/s41287-020-00313-9>.
- True Price. 2018. Cocoa farmer income. April 2018. [https://files.fairtrade.net/publications/2018\\_FairtradeCocoaFarmerIncomeCDI.pdf](https://files.fairtrade.net/publications/2018_FairtradeCocoaFarmerIncomeCDI.pdf).
- UN DESA. 2020. Financing sustainable forest management: a key component of sustainable COVID-19 recovery. *The United Nations Department of Economic and Social Affairs*. Policy Brief 88. [https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/PB\\_88.pdf](https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/PB_88.pdf).
- Villacis, A., Alwang, J., and V. Barrera. 2020. Does the Use of Specialty Varieties and Post-Harvest Practices Benefit Farmers? Cocoa Value Chains in Ecuador. Selected Paper prepared for presentation at the Southern Agricultural Economics Association (SAEA) Annual Meeting, Louisville, Kentucky, February 1-4, 2020.
- WCO. 2020. COVID-19 and Latin American Cocoa Farmers: Disruptions, Community Ties, and a Mobile App. *World Cocoa Organization*. <https://www.worldcocoafoundation.org/blog/covid-19-and-latin-american-cocoa-farmers-disruptions-community-ties-and-a-mobile-app/>.
- WFP. 2020. 2020 - Global Report on Food Crises. *World Food Programme*. <https://www.wfp.org/publications/2020-global-report-food-crises>.
- WHO. 2020. Chikungunya. <https://www.who.int/news-room/fact-sheets/detail/chikungunya>.
- World Bank. 2020. Cote d'Ivoire 10th Economic Update. Economic Updates and Modeling: Cote d'Ivoire and the COVID-19 Pandemic. <https://doi.org/10.1596/34559>.
- Zimmerer, K., and S. de Hann. 2020. Informal food chains and Agrobiodiversity need strengthening—Not weakening—To address food security amidst the COVID-19 crisis in South America. *Food Security* 12: 891–894. <https://doi.org/10.1007/s12571-020-01088-x>.

**Publisher's Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.