

VALUE CHAIN ANALYSIS IN LIBERIA

Cocoa

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Abbreviations

AfDB: African Development Bank

CBL: Central Bank of Liberia

CNG: Compressed Natural Gas

GHG: Greenhouse Gas

GoL: Government of Liberia

KOAFEC: Korea Africa Economic Cooperation

MoA: Ministry of Agriculture

R&D: Research and Development

SWOT: Strength, Weaknesses, Opportunities, Threats

TSR: Technically Specified Rubber

VC: Value Chain

VCA: Value Chain Analysis

Cocoa Thesis

The cocoa bean is the dried and fully fermented fatty seed of the cocoa tree (*Theobroma cacao*). It is Liberia's second most important export crop, with nearly 50,000 households engaged in production that is mostly informally exported to international markets via neighboring countries. In addition to export through neighboring countries, local cocoa nurseries procure cocoa seeds from neighboring Ghana and Ivory Coast because there are few cocoa seed farms in Liberia. Smallholder cocoa farmers in Liberia struggle to plant much-needed new cocoa trees even though current farms are stocked with very old cocoa trees that are well beyond their productive years. A few of the major cocoa exporters in the country offer pre-financing and sell some key production inputs but the size and consistency of these services are not sufficient to make material changes in the sector. Liberian cocoa yields around 200kg/hectare, 30% of that obtained in neighboring countries, and just 20% of its potential, demonstrating the inefficiencies but large-scale potential of the sector. Lastly the price of cocoa on international markets has proven to be unpredictable for over the past decade, creating economic stress on the local markets the commodities are sourced from.

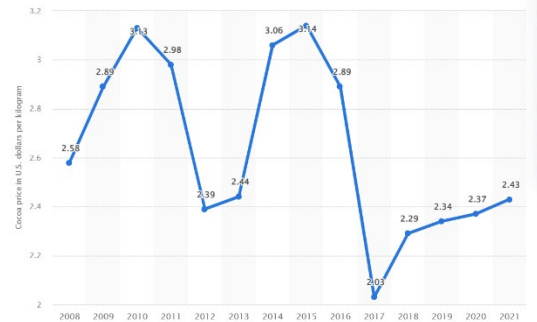


Chart 1. 13-year Cocoa Prices

For these and several other reasons, smallholder farmers need to plant new farms, procure quality inputs at reasonable prices and access affordable capital. Additionally, the MoA needs to incentivize companies that operate further up the value chain from harvesting to manufacture higher value end products for domestic, regional, and international consumption.¹

Cocoa Sector

As of 2016, there were over 13,000 smallholder cocoa farmers working on an estimated 70,000 acres of land across Liberia with an average yield of 110kg/acre, or 7.7 million kg per year. Using the conservative assumption, considering volatility, that the average price of cocoa is around \$2/kg, the value of the existing cocoa production in Liberia, without additional investments is about \$15 million. However, the potential yield per acre is actually 650kg/acre or 45 million kg per year which has a value of over \$90 million. In short, the sector is being underutilized by nearly 500%.

The cause for the large disparity between the actual and potential productivity of cocoa farms can be explained by the following points²:

- Excessive trade of wet cocoa
- Need for clearer price incentives
- Weak business-oriented cooperatives
- Side selling by cocoa farmers
- Poor system of grading and traceability
- Less than 2% farmers use fertilizers
- Few processing and grading facilities

¹ <https://www.statista.com/statistics/237152/world-cocoa-grindings/>

² Wienco's smallholder Farmers Financing Model 2016

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Estimates show that in Cote d'Ivoire the average per-farmer-yield of cocoa per year is 500kg, meanwhile in Liberia, the estimated productivity per farmer in cooperatives (where their productivity is more readily measurable) was 40kg of cocoa per year. This disparity is material and cannot be explained away by one factor but rather a myriad of well documented factors, some in the aforementioned list.

To become economically viable, farmers' productivity must increase substantially. Some analysis indicate that the productivity of Liberian farmers could readily increase at least five times to 200kg per farmer.³ The first step to addressing this gross underperformance is for Liberian farmers to form well organized cooperatives which will give them the bargaining power they lack to negotiate for the inputs and assistance they need and, consequently, increase production volumes and quality.

Characteristics of Efficient and Well-functioning Cooperatives

- Well-defined objectives
- Adequate governance and organizational structure
- Operating on sound business principles and business practices
- Permanent implementation of zero-loss and capitalization policies
- Transparent and frequent communication with members

Improper post-harvest processing and handling is pervasive and has led to significant origin discounts on world markets. Low quality was even institutionalized when the Liberia Produce Marketing Corporation (LPMC) created a market for "fair average quality" cocoa that is drastically below international quality standards. This situation has been perpetuated further by the operation of traders from neighboring countries who purchase said sub-grade cocoa.⁴

Overall, the cocoa sector needs a complete overhaul that includes regulatory changes (like the Centers for Cocoa Development (CCD) set up by Solidaridad), farmers reorganization and increased investment capital in innovation. These reforms should focus on two pillars of the supply chain: (1) planting and harvesting; and (2) processing and packaging to move Liberia from merely a cocoa producing country to a cocoa-products producing country.



Source: Transparence Cacao

Cocoa Global Trends

Cocoa processing involves the conversion of cocoa beans into different forms such as cocoa liquor, cocoa butter, cocoa cakes, and cocoa powder with the chocolate industry representing the biggest end user of the bean. Aside from chocolate, the biggest consumable end products of cocoa are chocolate milk, biscuits, ice cream, and cakes. Similarly, cocoa butter is widely used during the production of soaps, cosmetics, and pharmaceutical products. The uses for cocoa beans are countless

³ Improving Access to Finance in the Agricultural Sector of Liberia 2015

⁴ Reforming Cocoa and Coffee Marketing in Liberia

and cuts across many industries which explains how the global cocoa market reached a volume of 5 million tons in 2020.

Côte d'Ivoire and Ghana currently represent the world's two biggest producers of cocoa, together accounting for nearly 60% of total global cocoa production. Including countries like Cameroon and Nigeria, that are also top cocoa producers on the continent, Africa accounts for more than 70% of the total global cocoa production. Despite being the largest producer, the region accounts for less than 21% of the total global cocoa processing market. Fortunately, the biggest importer and processor is nearby Europe and, looking forward five years, analysts expect the global cocoa processing market to exhibit significant growth.⁵

Cocoa is very much a smallholder business. For the Liberian cocoa sector to catch up to global trends the productivity and scale of cocoa production systems must be increased while the development of a competitive and efficient cocoa marketing chain needs to be fostered. The way that cocoa is grown, the inputs used, the methods to process, and access to moisture-controlled storage strongly determine the value and attractiveness to investors and consumers. Currently, the cocoa harvested in Liberia is known for its low quality because the trees are old, very little fertilizer is used and farmers are not well-trained to manage the exceptional moisture in the beans due to Liberia's noteworthy humidity. Once these issues are met, possibilities for commercializing Liberian cocoa expand.



Source: Bio Eco Actual

Cocoa Opportunities

1. Organic & Fairtrade Certification

Cocoa is one of the most widely used raw materials in the food and beverage industry. The rising awareness among consumers of the health benefits of organic cocoa will remain the primary driver for the growth of the global organic cocoa market, which is experiencing significant growth. The demand for organic cocoa will also continue to increase exponentially in line with population growth; fast growing countries like China, Korea, India, and Japan will augment the demand for cocoa products globally.

Organic farming aims to produce food using natural substances and processes and so tends to have limited environmental impact. It encourages the responsible use of energy and natural resources; maintenance of biodiversity; preservation of regional ecological balances; enhancement of soil fertility; and the maintenance of water quality. Additionally, organic farming rules encourage a high standard for animal welfare and require farmers to meet the specific behavioral needs of animals. While cocoa production is often associated with overexploitation, environmental unsustainability, and poverty, organic and fairtrade cocoa has emerged as an alternative that improves the quality of the products and the social justice associated with them - that is, cocoa that is both socio-economically and environmentally sustainable because it is produced and processed using natural techniques such as crop rotation, biological crop protection, green manure and compost is increasingly more sought-

⁵ https://www.researchandmarkets.com/reports/5311826/cocoa-processing-market-global-industry-trends?gclid=CjwKCAjw46CVBhB1EiwAgy6M4urOa31wP5djJo8F5otiv3bwsM4VRPRduzEgMhW1-RnXboKcGGz6RRoCEpQQAvD_BwE

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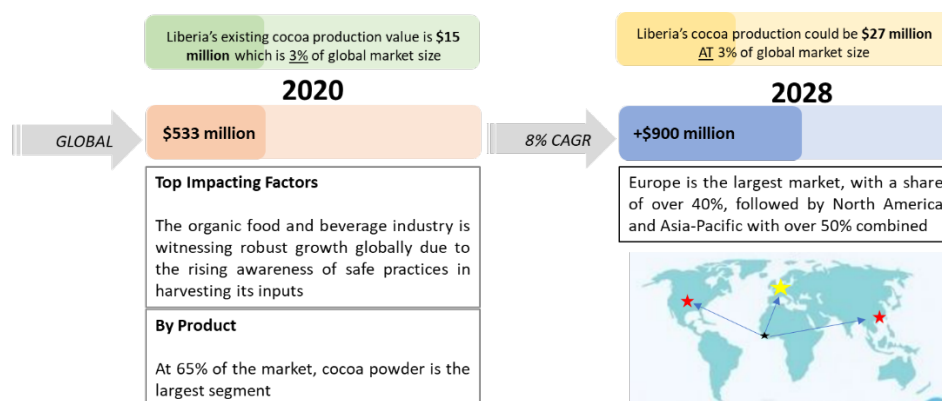
after by consumers. Alongside social and environmental benefits are the health benefits of cocoa. Cocoa is a rich source of an antioxidant that helps lower blood pressure, prevents inflammation and is the only material used in the production of dark chocolates. The rising popularity of healthier products among millennials is projected to further thrust the organic cocoa market forward.

Quality concerns aside, Liberian cocoa already possesses many of the characteristics that appeal to specialty buyers and set it apart from other cocoa producers⁶:

1. Small size of cocoa sector appeals to niche, specialty chocolate makers
2. Many of the old tree varieties found in Liberia pre-date the country's civil conflict, which began in 1989, and so offer unique flavors that have been lost in Ghana and Côte d'Ivoire, where older trees have been replaced with uniform hybrid varieties developed for their high productivity and resistance to disease
3. Farmers lack the means to purchase chemical fertilizer and pesticides so production is free from chemicals
4. Exceptional biodiversity in its largely intact rainforests

The size of the organic cocoa market in 2020 was \$533 million and is expected to grow to \$943 million by 2028. This means that the value of the Liberian cocoa market in 2020 was \$15 million, or 3% of the global market size, but if Liberia's production were to keep up with global growth and can be 100% organic certifiable the value of its cocoa market will reach \$27 million by 2028, or 3% of \$943 million. In recent years, there has been a strong increase in the sale of cocoa beans that are both organic and Fairtrade, which is evidenced by data showing that for just the three months from October to December 2019, farmers in Côte d'Ivoire earned over \$15 million more on their Fairtrade sales compared to conventional prices. Also, between 2014 and 2018, the volume of cocoa beans certified by both standards increased by 39% globally, amounting to almost 34,000 tons in 2018. While it is expensive, positioning Liberia as a source of organic and fairtrade cocoa would increase yields and quality making this a critical move to ensure growth this sector.^{7,8}

Figure 1. Size of Global Cocoa Market



⁶ <https://african.business/2021/08/agribusiness-manufacturing/liberia-courts-premium-markets-to-boost-cocoa-earnings/>

⁷ <https://www.globenewswire.com/news-release/2022/03/29/2411957/0/en/Organic-Cocoa-Market-to-Hit-USD-942-57-Million-by-2028-Organic-Cocoa-Industry-Exhibiting-a-CAGR-of-7-42-2021-2028.html>

⁸ <https://www.bioecoactual.com/en/2022/01/11/organic-fair-trade-cocoa/>

Aside from the tailwinds that could drive the growth and attractiveness of this sector to investors, the benefits to Liberia of creating an enabling environment for companies to easily obtain organic certifications are as follows:⁹

- Price Premiums - additional \$540/ton for Organic and Fair-Trade Cocoa
- Investment in farmers by impact-driven companies
- Improvement in cocoa quality
- Environmental conservation
- Reduction and eventual prevention of child labor
- Long term investment in Liberia

2. Cocoa Seedlings and agrochemicals

For a significant boost to cocoa production, farmers need to plant affordable cocoa seedlings to grow new tree stocks and they need adequate agrochemical inputs over the course of the growing season to ensure quality harvests. As an interim strategy, Liberia can develop barter deals with neighboring producers to acquire seed technology, however, Liberia needs to develop its own agri-inputs (seedlings and fertilizer) sector to sustainably support the growth of the cocoa value chain.

Currently the private sector agrochemical supply chain in Liberia is very underdeveloped and prices are several times higher than those found in other parts of West Africa, mainly due to low volumes and the high transaction costs of importing through Monrovia. Consequently, cocoa farmers use inputs sparingly and some do not use them at all. Efforts by the MoA are therefore needed to facilitate new business linkages along the input supply chain to spur the demand and use of fertilizers among farmers. Note that given cash constraints, credit arrangements would also need to be made accessible and affordable to these same farmers.

Aside from planting new productive trees, farmers are managing plantations full of ageing trees with decreasing yields. The default plans have revolved around the planting of new, highly productive, disease-resistant trees. But research shows that the use of chemical fertilizers can also help to revive existing old plantations. A pilot study on the impact of fertilizer showed that its use on degraded farms with mature trees had a clear positive impact on the productivity of cocoa; after just one year of application the foliage on degraded farms was widely rebuilt. Fertilizer use also slows the rate of tree mortality and results in higher yields and higher-quality pods.¹⁰

Agrochemical expense at West African prices is estimated at approximately \$150 per hectare or \$370 per acre.¹¹ Given that 70,000 acres of land is currently under cocoa production in Liberia, the implied estimated value of the agrochemicals market specifically for the production of cocoa in Liberia is at least \$26 million.

3. Cocoa Butter

Cocoa butter is a natural, edible vegetable fat extracted from the cocoa bean. It is used to make chocolate, ointments, and suppositories, as well as skin care and cosmetic products. Due to its high

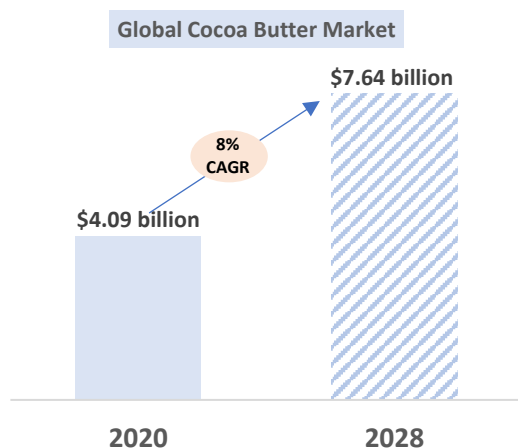
⁹ <https://www.growliberia.com/insights/premium-cocoa-market-opportunity/liberias-premium-cocoa-market-opportunity>

¹⁰ <https://businessfightspoverty.org/how-fertilizer-can-double-cocoa-production/>

¹¹ Intensified Cocoa Sustainable Development Liberia Report

melting point, it is ideal for use in products that require a solid consistency, such as lipsticks and balms. Almost all Liberian cocoa is sold on the bulk market for use in the cosmetics industry.¹²

Chart 2. Global Cocoa Butter Market



The global cocoa butter market is projected to grow at a CAGR of 8.13% between 2020 and 2028 to reach roughly \$8 billion.¹³ The growth in the market can be attributed to the increasing demand for cocoa butter in food, cosmetic and pharmaceutical applications. Cocoa butter is used as an ingredient in various food items due to its smooth texture and rich flavor. It is also used as a base for making skin care products owing to its emollient properties. In addition, it has various therapeutic properties such as anti-inflammatory, antioxidant, and antibacterial which makes it suitable for use in pharmaceutical

products. Increasing demand for cocoa butter in the food and beverage industry as a natural preservative and flavoring agent will also drive the market growth. Overall, rapid urbanization in developing countries and the changing tastes that come with will drive the growing demand for cocoa butter.¹⁴

The two main types of cocoa that dominate are food and pharmaceutical grade. Food grade is used for classifying edible products such as meat, poultry, seafood, and processed food. It also has essential fatty acids which are considered healthy for human consumption. Pharmaceutical grade cocoa butter is the purest form of cocoa and typically used in the manufacture of ointments, creams, and lotions.

Liberia’s cocoa production represents about 3% of the global production of cocoa. Using this metric as a guide, at 1.5% (discounting the 3% by half to account for expected inefficiencies that would decrease ultimate volumes until economies of scale are achieved) market penetration of the 2020 cocoa butter market, Liberia could have earned nearly \$60 million.

4. Carbon Credits – Carbon Sink

Climate change and biodiversity loss caused by an increase in the earth’s temperature due to greenhouse gas emissions are some of the defining challenges the world faces today and one of the main sources to counter this change, the Amazon rainforest, is now emitting more carbon dioxide than it is absorbing.¹⁵ Rainforests are critical for managing climate change as they stock and absorb carbon and are home to more than 50% of terrestrial biodiversity, while only covering 6% of the Earth’s surface.¹⁶ The Guinean forests of West Africa rank fourth on the list of world hotspots in terms

¹² <https://african.business/2021/08/agribusiness-manufacturing/liberia-courts-premium-markets-to-boost-cocoa-earnings/>

¹³ <https://www.verifiedmarketresearch.com/product/cocoa-butter-market/>

¹⁴ https://dataintelo.com/report/cocoa-butter-market/?utm_campaign=copy

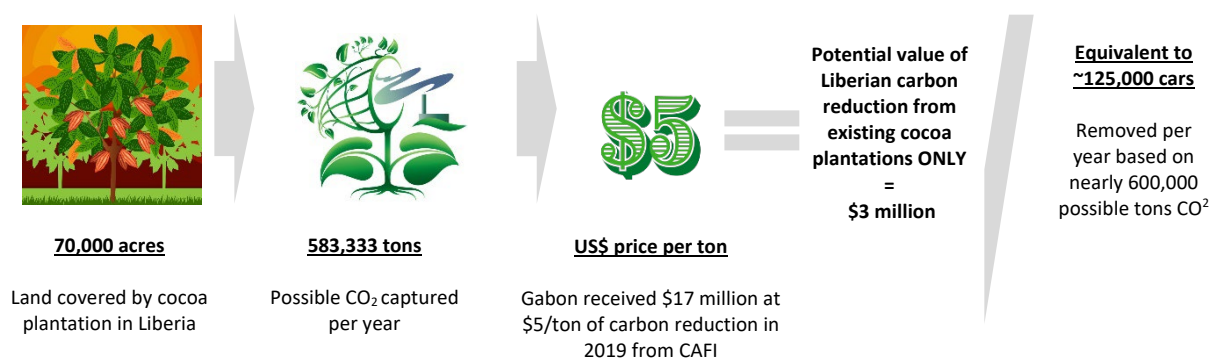
¹⁵ <https://www.devex.com/news/gabon-plans-to-become-a-green-superpower-by-harnessing-its-rainforest-101636#:~:text=On%20Sept.,Gabon%20to%20offset%20their%20emissions>

¹⁶ <https://www.un.org/africarenewal/magazine/july-2021/gabon-becomes-first-african-country-receive-payment-reducing-co2-emissions>

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of intact area, rank first for animal biodiversity, and rank eighth in plant biodiversity. Therefore, the Guinean sub-region is of immense significance for biodiversity and carbon storage - Liberia sits entirely in the Upper Guinea sub-region of the West Africa Guinea Forest Zone. The country alone contains the largest carbon sink in Africa outside of the Congo Basin, and accounts for 43% of the remaining Upper Guinean Forest ecosystem.¹⁷ At the same time, Liberia faces continued threats to its forestry due to both commercial and chainsaw logging, shifting cultivation, the clearing of forests for permanent agriculture, charcoal production, and rising urban and rural populations. With the continued growth in the use of carbon credits and the precedent set by Gabon as the first African country to receive results-based payments for reducing emissions caused by deforestation and forest degradation, Liberia is well positioned to benefit from its natural forest ecology.

Figure 2. Potential Value of Existing Cocoa Production



Key Takeaways

The current combined value to Liberia of the aforementioned latent opportunities in the cocoa sector is over \$110 million. Increasing volumes and quality would enable the country to attract investors all along the value chain from inputs for primary production all the way to marketing and distribution. Of all the value chains that are key for growing the Liberian agriculture industry, cocoa is the most widely used. It has application across countless industries and globally and the economic trends in each subsector of the cocoa sector are pointing to sustained growth for the medium to long term. Therefore, building a national rehabilitation plan aimed at improving cocoa yields, quality, certification, and commercialization is needed.

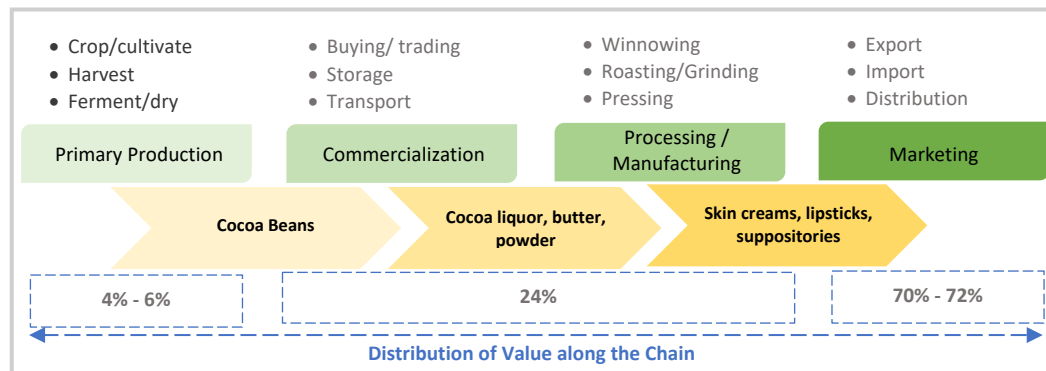
Investment Impact:

1. Improvements of farm-to-market roads
2. More competitive cocoa marketing driven by reform of market policies and regulatory procedures
3. Increased attention to critical processes like fermentation, drying and storage
4. The selection, production, and distribution of improved planting material
5. Producer training
6. Agricultural input marketing
7. Potential development of rural finance
8. Increase in jobs and income for cocoa farmers
9. Increase revenue and profits for operators due to access to organic products and proximity to large demand markets

¹⁷ https://www.profor.info/sites/profor.info/files/WAFS-draft-42111_0.pdf

Cocoa Value Chain

Figure 3. Cocoa Value Chain



Source: Research Leap; Abdulsamad et al. (2015); Díaz-Montenegro (2019)

“Cocoa accounts for 12% of the employment force in Liberia, yet the lack of access to improved planting materials and skills continues to drive farmers away from cocoa production.”

*Michael Doe - Solidaridad’s Country Representative for Liberia*¹⁸

A typical cocoa bean value chain involves the operation of four major segments – Primary Production, Commercialization, Processing and Manufacturing, and Marketing. During primary production cocoa farmers in Liberia, consisting of at least 50,000 households, cultivate, harvest, ferment and dry the cocoa beans. This is the first bottleneck in the cocoa value chain because farmers do not tend to use adequate agri-inputs like disease-resistant seedlings or high-yielding fertilizers. This, in turn, effects the ultimate yield from the cocoa trees and quality of the cocoa bean. The quality is measured not only by the proportionate chemical composition of the beans but how well the farmers ferment and dry the beans. If the moisture content of cocoa beans is too high, mold and bacteria will grow on the beans, effecting either the price buyers offer farmers or the ultimate sale. Liberia is known for its low-quality cocoa, and the root cause of that occurs at the very beginning of the value chain. This then goes on to influence subsequent segments like the commercialization stage, which includes transportation, quality control, as well as differentiation (e.g., fairtrade or organic certification). Some agents active in the commercialization of cocoa may also be involved in the marketing segment. The development of this segment would naturally follow the development of the precedent segment as increased volumes from harvesting would drive investments in transportation services to get the product to demanding buyers. The second major bottle neck is at the processing and manufacturing segment. At this stage, the beans are transformed from cocoa into products like chocolate bars or lipsticks. This is also where the quality assured in the first segment will enable companies to realize optimal value. During the last stage, the processed cocoa is sold for domestic consumption or exported. Sometimes, even the shells and residue from the process can be exported.¹⁹

This shows that investments in the cocoa seedlings, fertilizer and fairtrade/organic designations would have the biggest impact on the sector because the increased volumes and quality would attract more investments and partnerships while commanding a higher price. In 2021, high-end organic skin care company LUSH visited Liberia and Sierra Leone looking to diversify its supply of cocoa. As an impact-driven company, it aims to help farmers reach their potential, procure organic and fair-trade feedstock cocoa while preserving the rainforests and helping farmers grow their income through access to new

¹⁸ <https://www.solidaridadnetwork.org/news/cocoa-value-chain-in-liberia-receives-a-boost/>

¹⁹ <https://www.agricompas.com/how-can-value-chain-analysis-be-used-to-make-cocoa-farming-more-sustainable/>

and better markets.²⁰ Ensuring quality, volume and international accreditations will unlock investments from companies like Lush looking for sustainable quality.

Cocoa SWOT Analysis

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Copious end uses across various sectors • The topography of the land (many flood plains) is conducive to growing cocoa • Close proximity to the world's largest organic chocolate producer - Europe 	<ul style="list-style-type: none"> • High cost of doing business • Limited access to inputs • Unorganized cooperatives • Less than 2% of farmers use fertilizers • Poor quality of trade and transport infrastructure • Lack of drying capacity 	<ul style="list-style-type: none"> • Need for cocoa trees nurseries • Need for warehousing and aggregation points between farmers and markets • Financing for inputs • Replant cocoa trees and obtain carbon credits • Fast growing global organic cocoa markets • Fast growing markets where cocoa is the main feedstock 	<ul style="list-style-type: none"> • Ageing cocoa trees • Informal side-selling due to lack of penalties • Cocoa black pods disease and rodent infestations

²⁰ <https://www.growliberia.com/insights/premium-cocoa-market-opportunity/liberias-premium-cocoa-market-opportunity>