Kaunas University of Technology
School of Economics and Business

Upgrading Cocoa Value Chain for Enhanced International Competitiveness in Ivory Coast and Ghana

Master's Final Degree Project

Felix Bennin
Project Author

Assoc. Prof. Dr. Egidijus Rybakovas
Supervisor

Kaunas, 2025

Kaunas University of Technology
School of Economics and Business

Upgrading Cocoa Value Chain for Enhanced International Competitiveness in Ivory Coast and Ghana

Master's Final Degree Project

International Business (6211LX029)

Felix Bennin
Project Author

Assoc. Prof. Dr. Egidijus Rybakovas
Supervisor

Prof. Dr. Jurgita Sekliuckienė
Reviewer

Kaunas, 2025

Kaunas University of Technology

School of Economics and Business

Felix Bennin

Upgrading Cocoa Value Chain for Enhanced International Competitiveness in Ivory Coast and Ghana

Declaration of Academic Integrity

I confirm the following:

1. I have prepared the final degree project independently and honestly without any violations of the copyrights or other rights of others, following the provisions of the Law on Copyrights and Related Rights of the Republic of Lithuania, the Regulations on the Management and Transfer of Intellectual Property of Kaunas University of Technology (hereinafter – University) and the ethical requirements stipulated by the Code of Academic Ethics of the University;

2. All the data and research results provided in the final degree project are correct and obtained legally; none of the parts of this project are plagiarised from any printed or electronic sources; all the quotations and references provided in the text of the final degree project are indicated in the list of references;

3. I have not paid anyone any monetary funds for the final degree project or the parts thereof unless required by the law;

4. I understand that in case of any discovery of the fact of dishonesty or violation of any rights of others, the academic penalties will be imposed on me under the procedure applied at the University; I will be expelled from the University and my final degree project can be submitted to the Office of the Ombudsperson for Academic Ethics and Procedures in the examination of a possible violation of academic ethics.

Felix Bennin

Confirmed electronically

Bennin, Felix. Upgrading Cocoa Value Chain for Enhanced International Competitiveness in Ivory Coast and Ghana. Master's Final Degree Project / supervisor Assoc. Prof. Dr. Egidijus Rybakovas; School of Economics and Business, Kaunas University of Technology.

Study field and area (study field group): Business, Business and Public Management.

Keywords: cocoa, upgrading, cocoa value chain, value capture, international competitiveness, global value chain, cocoa processing.

Kaunas, 2025. 74 pages

Summary

Cocoa is an essential crop that plays a significant role in the economies of West African countries. Together, Ivory Coast and Ghana produce more than half of the world's cocoa beans, signifying how important cocoa is to their communities and livelihoods. However, their participation in the global cocoa value chain is mostly confined to the production of raw materials, a limitation that constrains value capture, increases vulnerability to price volatility, and weakens their global competitiveness. Although they lead in global cocoa beans production, industrialized countries secure the majority of profits through processing and manufacturing activities.

The relevance of this study is emphasised by the increasing recognition of value chain upgrading as an enabler for economic transformation. Ivory Coast and Ghana experience limited advancement within the global cocoa value chain. Existing literature suggests that, by enhancing processing and manufacturing activities which are facilitated by robust infrastructure, effective institutions, and policies, can improve their position in global trade. Empirical research that specifically identifies conditions and strategies for upgrading within the cocoa sector remains notably scarce. Therefore, this study offers a theoretical and empirical analysis to address this gap in the existing body of knowledge.

Research object: Cocoa value chain upgrading in Ivory Coast and Ghana for enhanced international competitiveness.

Research aim: To identify means of upgrading the cocoa value chain of Ivory Coast and Ghana to enhance their international competitiveness on the global cocoa market.

The objectives of this research, undertaken to achieve the goal, are as follows:

1. To analyze the drawbacks inherent in a primary focus on the production stage within the global cocoa value chain, with the aim of highlighting the limitations this position imposes upon the international competitiveness of Ivory Coast and Ghana.
2. To develop a theoretical framework for enhancing international competitiveness by explaining alternative options for value chain upgrading, according to the industry's internal and external conditions and context.
3. To research Ivory Coast and Ghana's cocoa industry's internal and external conditions using global value chain framework, Porter's value chain, the Smile curve in analyzing the chain's structure to understand the distribution of value.
4. To identify impactful resources and capabilities that Ivory Coast and Ghana can deploy to upgrade their position within the cocoa value chain and thereby enhance their international competitiveness.

Research result: The findings of the research indicate that both Ivory Coast and Ghana face structural, institutional, and infrastructural barriers that impede their enhanced participation in higher value-added activities within the global value chain. The study further reveals that by leveraging resources (such as accessible financing and robust infrastructure), developing capabilities, adopting supportive policies and improving governance structures, these countries can upgrade their position within the global value chain. This transition will make them more competitive. Furthermore, the research proposes a conceptual framework that outlines enablers for upgrading, which is validated through mixed-methods empirical data obtained from industry stakeholders.

Bennin, Felix. Kakavos vertės grandinės vystymas siekiant didesnio Dramblio Kaulo Kranto ir Ganos tarptautinio konkurencingumo. Magistro baigiamasis projektas/ vadovas doc. dr. Egidijus Rybakovas; Kauno technologijos universitetas, Ekonomikos ir verslo fakultetas.

Studijų kryptis ir sritis (studijų krypčių grupe): Verslas, Verslas ir viešoji vadyba.

Reikšminiai žodžiai: kakavos pramonė, vertės grandinės atnaujinimas, kakavos vertės grandinė, vertės surinkimas, tarptautinis konkurencingumas, pasaulinė vertės grandinė, kakavos perdirbimas.

Kaunas, 2025. 74 p.

Santrauka

Kakava yra esminė kultūra, kuri vaidina svarbų vaidmenį Vakarų Afrikos šalių ekonomikoje. Dramblio Kaulo Krantas ir Gana kartu gamina daugiau nei pusę pasaulio kakavos pupelių, o tai rodo, kokia svarbi kakava yra jų bendruomenėms ir pragyvenimui. Tačiau jų dalyvavimas pasaulinėje kakavos vertės grandinėje, dažniausiai, apsiriboja žaliavų gamyba, o tai riboja šalyje sukuriamą pridėtinę vertę, padidina pažeidžiamumą dėl kainų svyravimo ir silpnina jų pasaulinį konkurencingumą. Nors darbe analizuojamos šalys pirmauja pasaulyje kakavos pupelių gamyboje, didžiioji pelno dalis gaunama perdirbimo ir galutinių produktų gamybos veiklose, kurios pletojamos kitose šalyse.

Šio tyrimo aktualumą pabrėžia vis labiau pripažįstamas vertės grandinės tobulinimas, kaip ekonominės transformacijos veiksnys. Dramblio Kaulo Kranto ir Ganos pažanga pasaulinėje kakavos vertės grandinėje yra ribota. Esama literatūra rodo, kad sustiprinus perdirbimo ir gamybos veiklą, kurią palengvina tvirta infrastruktūra, veiksmingos institucijos ir politika, galima pagerinti savo padėtį pasaulinėje prekyboje. Empirinių tyrimų, kuriuose būtų konkrečiai nustatytos kakavos sektoriaus modernizavimo sąlygos ir strategijos, yra labai mažai. Todėl šis tyrimas siūlo teorinę ir empirinę analizę, kaip pašalinti šią esamų žinių spragą.

Tyrimo objektas: Kakavos vertės grandinės atnaujinimas Dramblio Kaulo Krante ir Ganoje siekiant padidinti tarptautinį konkurencingumą.

Tyrimo tikslas: Nustatyti Dramblio Kaulo Kranto ir Ganos kakavos vertės grandinės atnaujinimo būdus, siekiant padidinti jų tarptautinį konkurencingumą pasaulinėje kakavos rinkoje.

Šio tyrimo uždaniniai, kurių buvo imtasi siekiant tikslo, yra šie:

1. Išanalizuoti trūkumus, būdingus daugiausia dėmesio skiriant žaliavos gamybos etapui pasaulinėje kakavos vertės grandinėje, siekiant pabrėžti apribojimus, kuriuos ši padėtis lemia Dramblio Kaulo Kranto ir Ganos tarptautiniam konkurencingumui.

2. Pagrįsti teorinę tarptautinio konkurencingumo didinimo veiksniu sistemą, paaiškinant alternatyvias vertės grandinės tobulinimo galimybes, atsižvelgiant į pramonės vidaus ir išorės sąlygas bei kontekstą.

3. Tirti Dramblio Kaulo kranto ir Ganos kavos pramonės vidines ir išorines sąlygas, pasitelkiant pasaulinės vertės grandinės sistemą, Porterio vertės grandinę ir Šypsenos kreivę, analizuojant grandinės struktūrą siekiant suprasti vertės paskirstymą.

4. Nustatyti reikšmingus išteklius ir pajėgumus, kuriuos Dramblio Kaulo Krantas ir Gana gali panaudoti, kad pagerintų savo padėtį kakavos vertės grandinėje ir taip padidintų tarptautinį konkurencingumą.

Tyrimo rezultatai: Tyrimo išvados rodo, kad tiek Dramblio Kaulo Krantas, tiek Gana susiduria su struktūrinėmis, institucinėmis ir infrastruktūrinėmis kliūtimis, kurios trukdo aktyviau dalyvauti didesnės pridėtinės vertės veikloje pasaulinėje vertės grandinėje. Tyrimas taip pat atskleidžia, kad pasitelkdamos išteklius (pvz., prieinamą finansavimą ir tvirtą infrastruktūrą), plėtodamos pajėgumus, taikydamos palankią politiką ir gerindamos valdymo struktūras, šios šalys gali pagerinti savo poziciją pasaulinėje vertės grandinėje. Darbe siūloma konceptuali sistema, kuri apibrėžia verslo modernizavimo priemones, kurios patvirtinamos naudojant mišrius metodus empirinius duomenis, gautus iš pramonės suinteresuotųjų šalių.

Table of Contents

List of Figures

List of Tables

List of Abbreviations

BMEL – Bundesministerium für Ernährung und Landwirtschaft (Federal Ministry of Food and Agriculture in Germany)

CCC – Conseil du Café-Cacao

CFI – Cocoa and Forests Initiative

COCOBOD – Ghana Cocoa Board

EU – European Union

FDA – Food and Drug Administration

GCI – Global Competitiveness Index

GDP – Gross Domestic Product

GHC – Ghanaian Cedis

GVC – Global Value Chain

HACCP – Hazard Analysis and Critical Control Points

HS – Harmonized System

ICCO – International Cocoa Organization

IISD – International Institute for Sustainable Development

ISO – International Organization for Standardization

ITC – International Trade Center

OECD – Organization for Economic Co-operation and Development

SER – Sociaal-Economische Raad (The Social and Economic Council of the Netherlands)

UN – United Nations

UN COMTRADE – United Nations Commodity Trade Statistics Database

UNICEF – United Nation's Children Fund

US – United States

USD – United States Dollar

WEF – World Economic Forum

Introduction

Trade has been a fundamental aspect of human civilization since ancient times, and continues to serve as a source of economic development. As societies have advanced, the same applies to the nature of trade in complex networks both within and across borders. International trade is recognized as a means of exchanging goods and services, but it is also an important element that fosters economic growth and innovative activities. This has enabled countries to leverage on their efficiency in producing specific goods while also gained access to various products and resources. The complexity of international trade has increased due to the global value chain, a phenomenon that shows the network of production, distribution, and consumption processes that define modern economies.

According to Koenig and Antras (2023), the advancements in information technology and communication, trade liberalization policies, and political changes have facilitated this transformation, allowing firms and countries to coordinate activities across geographical boundaries with efficiency. As a result, production processes have become fragmented, and firms and countries optimize their operations by sourcing inputs from countries that offer the best quality and cost-effectiveness.

Gentile et al. (2021) noted that the Organization for Economic Co-operation and Development (OECD) found a significant portion of global commerce involves global value chains, stating that 70% of international trade includes global value chain participation. This shows the role the global value chain play in shaping the trends in trade and international economic relationships. The prevalence of global value chains can be seen across diverse industries (e.g. automotive, textiles and apparel, agriculture, and consumer electronics), showing the interconnectedness of global markets.

Relevance of the Research

An essential agricultural commodity within the global market is cocoa, primarily recognized for its use in chocolate manufacturing, which accounts for about 90% of global cocoa output as reported by International Trade Centre (ITC, 2001), although this figure may have changed in recent years. This makes it a crucial part of the food industry, particularly for confectionary products. As a cash crop and major export for producing countries, cocoa is also a significant import for consuming nations. The cultivation and trade of cocoa beans have a history and remain an important income stream for many countries in Africa, Latin America, and Asia. This trade in cocoa involves commodities such as unprocessed cocoa beans, cocoa butter, cocoa powder, and other derivatives between countries. According to the 2021 industry report on cocoa beans, the major producers of cocoa beans in Africa are Ivory Coast and Ghana, while the largest importers include the United States, Germany, and the Netherlands (Tridge, 2021).

Value chain integration and upgrading are highly significant within the cocoa industry in African countries. By identifying conditions for the upgrading of their value chain, knowing how well to integrate and recognizing opportunities for enhanced value creation, these countries can enhance their international competitiveness, ultimately yielding benefits for their national economies and the broader cocoa industry.

Problem

The global cocoa market is dominated by Ivory Coast and Ghana, a position that has been held by both countries for several decades. The production of cocoa is a key factor in the economic growth of these countries, contributing significantly to their gross domestic product and export earnings. In the cocoa season 2022-2023, both countries collectively accounted for over 50% of the world's cocoa production (International Cocoa Organization [ICCO], 2024). Despite their status in production, their engagement is primarily focused on the raw material production stage of the cocoa value chain. This limited involvement restricts their ability to capture greater value and weakens their competitive position in the global marketplace. Therefore, this study focuses on identifying conditions, effective integration strategies, and opportunities for greater value addition to enhance the international competitiveness of Ivory Coast and Ghana.

Subject Matter of the Research

The research focuses on the global cocoa value chain, with emphasis on Ivory Coast and Ghana. It explores the potential for upgrading their cocoa value chains to achieve enhanced international competitiveness.

Research Object: Cocoa value chain upgrading in Ivory Coast and Ghana for enhanced international competitiveness.

Research Aim and Objectives

The aim of the research is to identify means of upgrading the cocoa value chain of Ivory Coast and Ghana to enhance their international competitiveness on the global cocoa market.

The objectives of this research, undertaken to achieve the goal, are as follows:

1. To analyze the drawbacks inherent in a primary focus on the production stage within the global cocoa value chain, with the aim of highlighting the limitations this position imposes upon the international competitiveness of Ivory Coast and Ghana.
2. To develop a theoretical framework for enhancing international competitiveness by explaining alternative options for value chain upgrading, according to the industry's internal and external conditions and context.
3. To research industry's internal and external conditions using global value chain framework, Porter's value chain, the Smile curve in analyzing the chain's structure to understand the distribution of value.
4. To identify impactful resources and capabilities that Ivory Coast and Ghana can deploy to upgrade their position within the cocoa value chain and thereby enhance their international competitiveness.

Research Methods

The study used both qualitative and quantitative methods for data collection to facilitate the understanding of the conditions that define the relevance of alternative solutions for upgrading the cocoa value chain. The study focused on gathering data related to market trends, production practices, stakeholders' perceptions, and policy framework. This included a review of secondary data sources, semi-structured interviews, trade data analysis, and structured surveys. The implementation of a mixed-methods design ensured a holistic and well-rounded analysis of the subject matter.

1. Issues in Cocoa Value Chain and International Competitiveness in the Ivory Coast and Ghana Cocoa Industry

The global cocoa industry involves a complex series of processes which begins with cocoa beans cultivation through to the sale of final cocoa products. This process encompasses cocoa beans processing, the manufacturing of cocoa-based products, and their distribution to consumers. As major global cocoa producers, Ivory Coast and Ghana accounted for 57% of total global cocoa production in 2022 (Figure 1). Nevertheless, a paradox exists. Despite their dominance in cultivation, these countries primarily occupy the initial stage (production) and have limited involvement in processing (grinding), thus gaining a limited share of the overall value. This limited participation, presents a significant challenge for Ivory Coast and Ghana. Consequently, they face disadvantages such as being price takers with minimal control over cocoa bean prices, which negatively affects the competitiveness and developmental prospects of their economies. Additionally, they forgo the potential profits generated from processing cocoa beans into higher-value products. These situations highlight the need for a critical analysis of the cocoa value chain in these countries.

The cocoa value chain involves a sequence of interconnected activities or transformations, which begins with the production stage (agricultural production) that involves cocoa tree cultivation, pod harvesting, fermentation, and drying process for cocoa beans. These dried raw beans then proceed to the processing stage (industrial processing), where the cocoa beans are converted into semi-finished products through roasting, cracking to extract nibs, grinding the nibs into cocoa liquor, and pressing the liquor to yield cocoa butter and cocoa powder. The final stage is manufacturing, which involves the transformation of these cocoa-based ingredients into finished consumer products, including chocolate bars, cocoa drinks, and cakes, along with branding and packaging (Figure 2). For greater value gains and enhanced international competitiveness, a shift from solely agricultural production towards industrial processing and manufacturing is necessary.

The global cocoa value chain also comprises multiple actors, ranging from farmers, intermediaries, industry players (encompassing manufacturers, processors, and sellers), and ultimately consumers. The specific functions performed by each actor within the chain contributes to the overall value creation of cocoa products. The lead actors (processors and manufacturers) such as multinational chocolate companies like Mars and Nestle, and large cocoa processors like Cargill, and Barry Callebaut possess significant power. This is because they control access to markets and set quality standards. Thus, power asymmetries are evident in the cocoa value chain as lead actors hold bargaining power over producers (Ponte, 2002; Barrientos, & Asenso-Okyere, 2009; Barrientos, 2014). The reliance on cocoa bean exports by Ivory Coast and Ghana, worsens their openness to price volatility and shifts in global demand. Also, structural barriers such as lack of capital, technology and infrastructure presents challenges to producers in accessing high value segments of the chain.

PRODUCTION OF COCOA BEANS
(thousand tonnes)

	2021/22		Estimates 2022/23		Forecasts 2023/24	
Africa	**3589**	**74%**	**3719**	**73.7%**	**3042**	**70.2%**
Cameroon	295		270		300	
Côte d'Ivoire	2121		2241		1740	
Ghana	683		654		450	
Nigeria	280		315		300	
Others	210		240		252	
Americas	**973**	**20%**	**1077**	**21.3%**	**1035**	**23.9%**
Brazil	220		220		200	
Ecuador	365		454		430	
Others	388		403		405	
Asia & Oceania	**265**	**5%**	**253**	**5.0%**	**255**	**5.9%**
Indonesia	180		160		160	
Papua New Guinea	42		43		45	
Others	43		50		50	
World total	**4826**	**100%**	**5050**	**100%**	**4332**	**100%**

Figure 1. Global cocoa production Source: International Cocoa Organization (ICCO), 2024

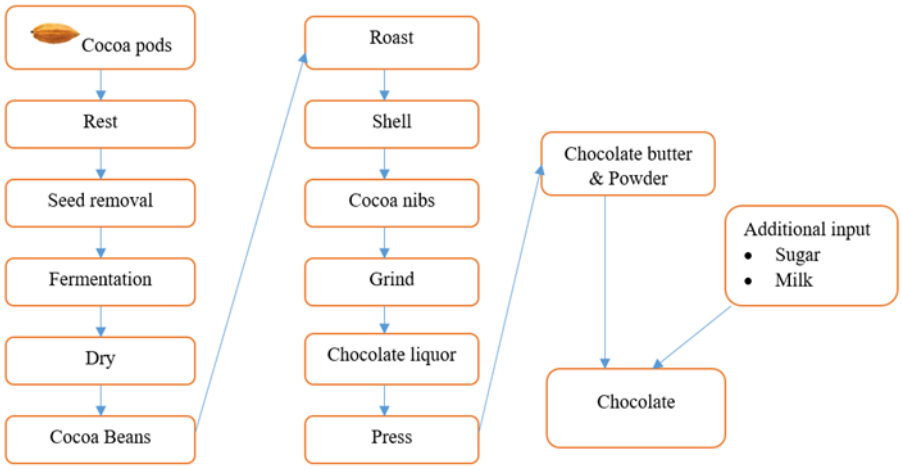

Figure 2. Cocoa commodity chain Source: Talbot, J. M. (2002); Parra-Lancourt, M. (2021)

1.1. Export of Cocoa and Cocoa Preparations

A wide variety of products made from cocoa beans are included in cocoa and cocoa preparations. The International Trade Centre (ITC, 2024) categorizes these products under specific Harmonized System (HS) codes which are HS1801 (cocoa beans), HS1802 (cocoa waste), HS1803 (cocoa paste), HS1804 (cocoa butter), HS1805 (cocoa powder) and HS1806 (chocolate and other food preparations containing cocoa).

These Harmonized System codes of cocoa and cocoa preparations can be categorized according to the three distinct stages of transformation from raw agricultural products into finished goods (i.e. production, processing, and manufacturing), as explained in Section 1.

Table 1. Cocoa value chain based on Harmonized System Codes Source: Author based on ITC (2024)

Value chain	**Harmonized System Codes**
Production	1801 and 1802
Processing	1803, 1804, and 1805
Manufacturing	1806

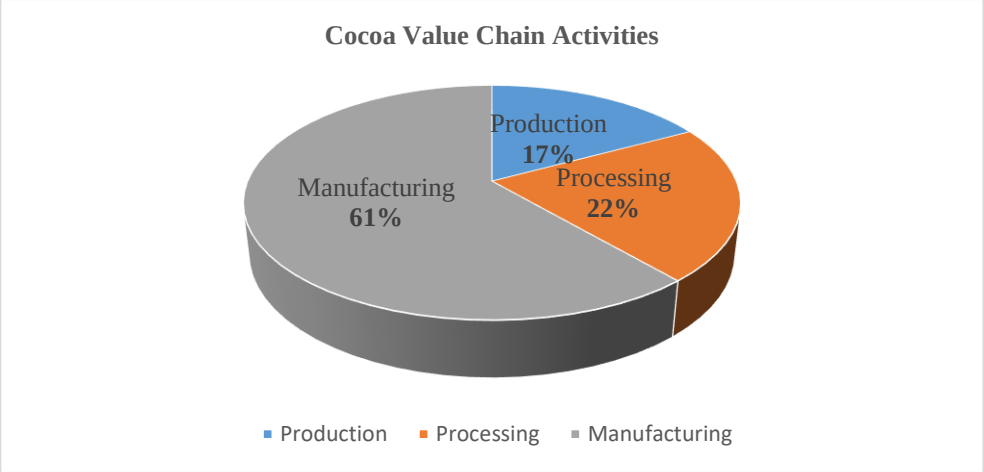

Figure 3. Global cocoa value chain activities (world export in the year 2023)
Source: Author's visualization from ITC Trade Map data (retrieved in 2024)

Figure 3 emphasizes the importance of adding value beyond primary production in the global cocoa value chain. A significant portion of the export value (61%) is captured in the manufacturing stage, showing that countries that have robust manufacturing industries in the cocoa sector reap greater economic benefits. Next to manufacturing, processing has a value capture of 22%. The initial stage (production) of the chain accounts for the least share of value (17%). In essence, countries that predominantly rely on the production stage capture less value. Figure 3 clearly shows the potential for increased value capture for cocoa-producing countries, if they can upgrade their position within the chain and participate more extensively in processing and manufacturing.

According to ITC (2024), in 2023, the global exports of cocoa and cocoa preparations were approximately 62 billion USD. Surprisingly, again, the leading exporters were not the leading producers of cocoa, Ivory Coast and Ghana. Instead, Germany and the Netherlands led again in cocoa and cocoa preparations exports, with values of 7.8 billion USD and 6.3 billion USD, respectively. Ivory Coast had an export value of 5.8 billion USD (3rd place) and Ghana had 1.9 billion USD (10th place) in exports.

Table 2. Export value of cocoa and cocoa preparations in 2023 (10 leading countries)
Source: ITC (2025) calculations based on UN COMTRADE and ITC statistics

List of exporters for the selected product
Product: 18 Cocoa and cocoa preparations
Unit : US Dollar thousand
Top 10 exporting countries

	Exporters	Exported value in 2019	Exported value in 2020	Exported value in 2021	Exported value in 2022	Exported value in 2023
	World	50289436	49909836	56174033	54962669	61175926
1	Germany	6180269	6031319	6716704	6692508	7793487
2	Netherlands	5228501	5009666	5740606	5307322	6288327
3	Côte d'Ivoire	4949027	5169822	5978718	4959539	5808824
4	Belgium	3916002	3983493	4405990	4078012	4908972
5	Poland	1890244	2144892	2420028	2426822	2763461
6	Italy	2176877	2163019	2559518	2513720	2752773
7	France	1981083	2104292	2367612	2256514	2606244
8	Canada	1668138	1726310	1912689	2110622	2222951
9	United States of America	1925616	1682692	1979976	2024138	2098865
10	Ghana	2714504		2385215	2165686	1898300

Table 3. Value chain position for the 10 leading exporters of cocoa and cocoa preparations in the year 2023

	COUNTRY	KEY ACTIVITY	NOTE	SOURCE
1	Germany	Processing & Manufacturing	Processes about 10% of world's cocoa beans	BMEL (2024)
2	Netherlands	Processing and Manufacturing	Grinds around 600,000 of cocoa annually	World Economic Forum (WEF), 2020
3	Ivory Coast	Cultivation and Production	Largest cocoa producer	ICCO (2024)
4	Belgium	Processing & Manufacturing	Major chocolate manufacturing center (11% of world chocolate export in 2020)	Statista (2024)
5	Poland	Processing & Manufacturing	Increasingly chocolate production (7.3% of world chocolate export in 2020)	Statista (2024)
6	Italy	Processing & Manufacturing	Known for its artisanal chocolate production (2.1 billion USD in chocolate export in 2020)	Statista (2024)
7	France	Processing & Manufacturing	Processing and manufacturing of premium chocolates	CBI (2020)
8	Canada	Processing & Manufacturing	With over 255 companies in chocolate production industry (1.99billion USD in chocolate export in 2022)	ibisworld.com
9	USA	Processing & Manufacturing	Largest consumers of chocolate globally in 2020	Statista (2024)
10	Ghana	Cultivation & Production	Second largest producer	ICCO (2024)

The composition of the ten leading exporting countries of cocoa and cocoa preparations in 2023 reveals a difference: eight nations, largely located in Europe and the USA, are predominantly processors and manufacturers, enabling them to gain greater value, whereas Ivory Coast and Ghana are mainly concentrated in the initial production stage of the value chain.

The Leading Cocoa-Producing Countries

Cocoa is significant to the Ivory Coast's economy, which has expanded since the nation got its independence. Presently, Ivory Coast is the main cocoa producer worldwide, and the crop is a significant contributor to the nation's economic expansion. About 15% of the country's gross domestic product and 40% of its export revenue originates from the cocoa industry (Cocoa and Forests Initiative [CFI], 2022 Annual Report). Subsistence farms provides the sizable portion of the country's cocoa production. Thus, cocoa beans production is attributed to smallholder farmers. These farmers harvest, ferment, dry, and then sell the cocoa beans to local cooperatives or traders. After acquisition of the cocoa beans, cooperatives or agents convey the cocoa beans to designated collection centers, where the beans undergo grading and packaging for export.

Ghana is ranked as the second leading cocoa-producing country, with an annual production of 654 thousand tons of the world total cocoa beans production. The country has a long tradition for the cultivation of cocoa and about 800,000 farming families depend of it for their livelihood. In terms of foreign exchange, the country annually earns about 2 billion US dollars, which contributes to government revenue and gross domestic product (COCOBOD, n.d.; GCB Strategy and Research Department, 2022).

As reported by the Ghana Cocoa Board, the cocoa sector's contribution to the nation's gross domestic product in 2021 amounted to 3.1 billion Ghana cedis, around 533 million United States dollars, which is over 10% of the country's gross domestic product. Only one organization manages the operations of the cocoa industry in Ghana, which is called Ghana Cocoa Board (COCOBOD). The purchasing of cocoa in Ghana is done directly by the entity or through its licensed intermediaries. The board then exports these cocoa beans to international markets.

Table 4. 2023 HS export values for cocoa and cocoa preparations Source: ITC calculations based on UN COMTRADE and ITC statistics

List of top 10 exporters for Cocoa and cocoa preparations

Harmonized Systems Code **1801** to **1806**

Unit : **US Dollar thousand** Year: **2023**

	Exporters	HS 1801			HS 1802			HS 1803			HS 1804			HS 1805			HS 1806		
		Export Value	Share in world %	QTY (Tonnes)	Export Value	Share in world %	QTY (Tonnes)	Export Value	Share in world %	QTY (Tonnes)	Export Value	Share in world %	QTY (Tonnes)	Export Value	Share in world %	QTY (Tonnes)	Export Value	Share in world %	QTY (Tonnes)
	World	9,892,549	16.02		671,244	1.09		4,093,339	6.63		5,832,553	9.44		3,338,756	5.41		37,796,955	61.20	
1	Germany	23,071	0.23	6759	5,514	0.82	39314	352,489	8.61	80111	555,500	9.52	96647	396,892	11.89	120431	6,263,604	16.57	989229
2	Netherlands	417,867	4.22	145833	7,092	1.06	31158	888,824	21.71	201098	1,531,546	26.26	260270	889,830	26.65	266750	2,553,168	6.75	453078
3	Côte d'Ivoire	3,329,064	33.65	1339307	643,822	95.91	179799	858,200	20.97	243419	694,473	11.91	140932	66,487	1.99	20287	216,778	0.57	63731
4	Belgium	691,668	6.99	219752	2,040	0.30	3624	115,400	2.82	25173	57,420	0.98	9064	34,957	1.05	6398	4,010,108	10.61	684816
5	Poland	1,073	0.01	169	625	0.09	830	49,498	1.21	11356	2,397	0.04	421	8,014	0.24	2068	2,701,852	7.15	446472
6	Italy	5,960	0.06	1931	8	0.00	21	15,024	0.37	1601	26,411	0.45	3774	35,456	1.06	11994	2,661,795	7.04	395211
7	France	3,727	0.04	764	3,104	0.46	1358	226,107	5.52	47978	477,916	8.19	82909	167,226	5.01	42045	1,731,200	4.58	325973
8	Canada	5,506	0.06	3172	1	0.00	0	37,425	0.91	7241	88,546	1.52	14763	29,897	0.90	12468	2,061,670	5.45	410969
9	United States of America	31,506	0.32	9377	252	0.04	229	62,799	1.53	15229	87,604	1.50	14290	117,843	3.53	30028	1,799,977	4.76	325669
10	Ghana	1,107,356	11.19	433288	3,037	0.45	13286	413,072	10.09	125684	234,826	4.03	0	112,579	3.37	37486	27,430	0.07	8505

Table 5. 2023 HS import values for cocoa and cocoa preparations Source: ITC calculations based on UN COMTRADE and ITC statistics

IMPORT VALUES of top 10 exporters for Cocoa and cocoa preparations

Harmonized Systems Code **1801** to **1806**

Unit : **US Dollar thousand** Year: **2023**

	Exporters	HS 1801			HS 1802			HS 1803			HS 1804			HS 1805			HS 1806		
		Import Value	Share in world %	QTY (Tonnes)	Import Value	Share in world %	QTY (Tonnes)	Import Value	Share in world %	QTY (Tonnes)	Import Value	Share in world %	QTY (Tonnes)	Import Value	Share in world %	QTY (Tonnes)	Import Value	Share in world %	QTY (Tonnes)
	World	10,887,056	17.38		27,953	0.04		4,463,765	7.13		5,898,292	9.42		3,525,552	5.63		37,556,168	59.96	
1	Germany	1,338,441	12.29	435012	7,411	26.51	2653	454,271	10.18	114223	874,271	14.82	168836	130,701	3.71	35741	3,004,951	8.00	521734
2	Netherlands	2,184,704	20.07	770768	2,515	9.00	9619	526,949	11.81	148552	472,460	8.01	97650	218,224	6.19	69535	1,779,289	4.74	321315
3	Côte d'Ivoire	3	0.00	0	-	0.00	0	-	0.00	0	5	0.00	1	69	0.00	8	8,060	0.02	2357
4	Belgium	977,515	8.98	325936	3,439	12.30	10721	363,126	8.13	84867	616,091	10.45	114469	101,608	2.88	34294	1,371,378	3.65	278255
5	Poland	38,363	0.35	11714	30	0.11	11	223,468	5.01	52499	348,263	5.90	59880	77,217	2.19	23135	1,204,059	3.21	230585
6	Italy	320,090	2.94	101266	692	2.48	3404	186,889	4.19	40652	279,744	4.74	49921	120,570	3.42	34954	785,063	2.09	133495
7	France	477,363	4.38	147057	3,848	13.77	15727	314,082	7.04	76923	458,159	7.77	88458	137,503	3.90	40216	2,727,424	7.26	503115
8	Canada	359,302	3.30	125832	63	0.23	20	92,466	2.07	21141	173,524	2.94	32338	96,793	2.75	27032	1,297,978	3.46	217435
9	United States of America	804,139	7.39	269073	223	0.80	26	551,986	12.37	146271	575,404	9.76	112053	392,890	11.14	103404	4,046,728	10.78	718196
10	Ghana	20,999	0.19	6137	33	0.12	468	2	0.00	17	2	0.00	1	361	0.01	159	3,248	0.01	0

Table 4 and 5 shows the exports and imports of cocoa and cocoa preparations by the ten leading exporting countries according to the Harmonized System codes 1801 to 1806, with a colour scale (green, yellow, and red) where high values are in Green and lowest values in red. The seven European countries and the USA basically imports the cocoa from cocoa-producing countries, add value to the imports by processing and/or manufacturing, then re-export cocoa beans and export cocoa products.

Table 4 supports the assertion that, HS1806 generates the most value among the other Harmonized System codes. Ivory Coast and Ghana export some quantities of higher-value cocoa products like cocoa paste and butter (processing activities), but very insignificant in the manufacturing activities, leading to a lower overall export value compared to countries that engage more extensively in cocoa processing and manufacturing. The inadequate processing capacity to transform a larger portion of their cocoa beans into higher value cocoa products has limited their ability to export processed and manufactured cocoa products. Hence, the increase reliance on exporting raw cocoa beans.

1.2. Summary of Issues on Upgrading Cocoa Value Chain and International Competitiveness

Despite Ivory Coast and Ghana's dominance in cocoa cultivation, accounting for over 50% of the global production, their heavily reliance in the initial production stage of the value chain has resulted in low value capture, dependence on volatile commodity markets (rendering them price takers), and constrained industrial development. These factors negatively impact Ivory Coast and Ghana's international competitiveness, because certain determinants of international competiveness such as higher revenue generation, employment creation and economic diversification are impeded by a focus on low-value retention through raw cocoa beans exports. The inherent volatility of raw commodity markets also leads to cocoa price fluctuations, fostering economic instability that negatively affect planning and competitiveness.

Furthermore, the strong reliance on raw material exports rather than industrial expansion, perpetuates both countries as low-development countries. The absence of a robust processing sector deters the development of industrial capabilities, including machinery, skilled labor and innovation.

Addressing these issues requires interventions to increase processing capacities, and integrate further along the value chain by transitioning to other segments that offer higher-value, which would reduce their reliance on raw cocoa beans production, maximize the economic benefits from the cocoa sector, and enhance their international competitiveness.

2. Theoretical Alternatives of Upgrading in Value Chain Aiming to Enhance International Competitiveness

Globalization has significantly accelerated the transnational movement of people, goods, capital, and information. This interconnectedness has led to benefits, including increased economic growth, job creation, innovation, and technological advancement. Consequently, these benefits act as enablers for enhancing a country's international competitiveness. Competitiveness, according to Lee and Karpova (2018), is the ability of a country to simultaneously increase its global market share and enhance the quality of life of its citizens, emphasizing the crucial role of knowledge in achieving this dual objective. Gygli et al. (2018) explained globalization as the interconnectedness of people, ideas, and economies across the globe which emphasized the creation of networks that transcend geographical boundaries, facilitated by advancement in technology, transportation, and communication. Globalization is linked to global value chain. Presently, almost every country is involved in global value chains, either as producers, manufacturers, consumers, etc. This means the creation of goods and services is fragmented across many countries, with production processes dispersed among different locations.

Upgrading in global value chains is a notion in understanding how companies, industries and countries enhance their competitiveness within the global economy. This concept of agricultural commodities, especially cocoa, is highly attractive for cocoa-producing countries due to their role in global cocoa production, but many often face challenges related to low-value addition and limited involvement in higher-value segments of the cocoa industry which impedes their international competitiveness.

Following the defined problem matter, the concept of global value chain will be examined and the literature findings on upgrading global value chain will be discussed.

The Concept of Global Value Chain

The development of the global value chain concept is based on the idea of dividing labour into smaller specialized tasks. This idea was popularized by British economist David Ricardo in the 19th century who suggested that by focusing on specific tasks, individuals and countries could become more efficient. This led to a global production system where countries interconnect in the production process of a single product.

In 1985, the use of "value chain" gained prominence with the publication of the book Competitive Advantage authored by Michael Porter, which presents the idea of looking at the whole spectrum of activities involved in a commodity or service from its initial idea to its end delivery. He grouped these activities into primary (the main activities) and secondary (that which render support to the primary tasks).

By the 1990's, Gary Gereffi began applying the value chain concepts on a global scale, which led to the term global value chains. He primarily focused on a governance structure, by analyzing how lead firms coordinate activities across multiple countries. Participating in the global value chain requires a suitable governance framework for the successful operations (occurring within and among firms) within global networks (Tang, et al., 2023). In essence, the global value chain creates a division of labour where different countries specialize in specific parts of the production process.

The global value chain is defined as the set of complete tasks that companies and employees engage in, to develop a commodity or service from its initial idea to the end usage and after, which is conducted globally and involves multiple organizations (Gereffi & Fernandez-Stark, 2011). This concept is a paradigm that helps to understand complex phenomena (the global division of labour) and the interconnectedness of different economies (Mehta, 2022). This explains the technological and production capabilities of countries, that leverage to create efficient and cost-effective production processes. To better understand how complex the global value chain is, dimensions are proposed that analyse how actors and activities are interconnected within a global production network.

2.2. Dimensions of Global Value Chain

Gereffi and Fernandez-Stark (2011) presented four dimensions to help understand product and service production and distribution processes on a global scale. These dimensions are the input-output structure, geographic scope, governance, and institutional context.

The Input-output structure of the global value chain describes the transfer of goods, services, and information within the production sequence. It focuses on how various inputs are transformed into outputs at different stages, to show the link between the various actors in the supply chain, from raw material sourcing to end users. Gereffi and Fernandez-Stark (2011) posited that, it is imperative to identify all the main activities in the value chain differentiated by the value they add to the product, which also enables the identification of respective roles of actors. Moreover, it provides insights into assessing the resilience of external shocks and identifies potential vulnerabilities in the global supply chain, since disruption in one sector affects other sectors that depend on its output as a source of input.

The activities within the global value chains span multiple countries and have production stages in different countries to benefit from comparative advantages. The geographic scope examines the distribution of activities across borders, considering the influence of factors such as market access, costs of labour, and regulatory environments. In cocoa, the raw beans are mostly grown in Ivory Coast and Ghana, while processing and manufacturing often take place in industrialized countries (Germany, the Netherlands, etc.).

The governance structure examines the relationship that coordinates the activities of different entities within the chain. It demonstrates how power and control are established, indicating who makes decisions, how risks and rewards are shared among participants. Gereffi and Frederick (2009) posited that, different companies and industries within a supply chain connect in various ways, ranging from one end, where companies operate on their own and transactions are mainly driven by market forces, to the other end where a single entity owns or controls multiple stages of production. This range includes a networked governance style, where through chain coordination lead firms wield power over suppliers without necessarily owning the firms. The authors further argue that, the governance structures (market, modular, relational, captive, and hierarchy) depend on: 1) the exchange of information among participants in the chain structure; 2) how easily the information can be codified and 3) the capabilities of suppliers. However, in circumstances where the existing governance structure does not fully explain the observed governance patterns within an industry, a strong institutional environment and market power become operative.

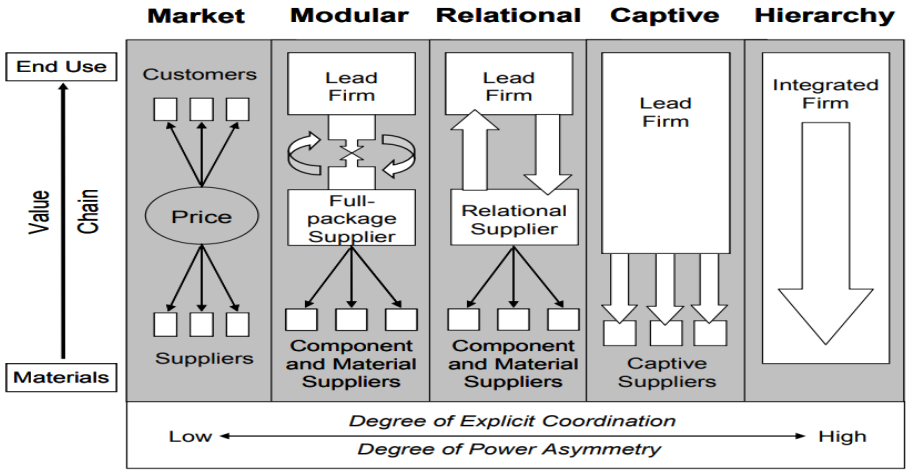

Figure 4. Global value chain governance structure Source: Gereffi & Fredrick (2009)

Firstly, the market governance involves transactions that occur through market mechanisms with minimal interaction and coordination between actors. Information is readily available, easily codified, and suppliers are typically numerous and competitive. Hence, switching cost to new partner is low. Price is the main mechanism of governance under the market structure instead of the influence of a lead firm.

In the modular structure, production is broken down into independent components. Each modular is produced by a separate supplier, but the overall design and coordination are managed by a lead firm. In the context of modular structure, information flow is relatively straightforward and can often be codified using standardize specifications.

The relational governance becomes pertinent when actors depend on complex and low transmissible, leading to regular engagements and the sharing of knowledge between parties. Trust is crucial. However, even with this interdependence, lead firms dictate requirements, which allows them to maintain a degree of influence in their relationships with suppliers. Producers often differentiate their product offerings based on quality, geographic origin and other distinguishing factors. The switching cost to new partner is high, because relational linkage takes time to build.

The captive governance possesses a high degree of dependence of one actor on another. The powerful buyer, for instance, large multinational corporation exerts significant control over its suppliers. The information flow is often limited and is controlled by the dominant actor. The suppliers have limited autonomy and must conform to strict quality control and standards. Under the captive governance, since the competences of lead firms are not within the production phase, they subsequently assist suppliers or producers to upgrade their production, in other for them (lead firms) to benefit from improved efficiency of its supply chain. In the context of cocoa, governance is usually captive as small farmers/ producers are heavily dependent on lead firms or intermediaries for market access, credit and technical support.

Lastly, the hierarchy governance represents full integration (vertical) by a lead firm. All activities from production to distribution is managed and controlled by the same entity. Basically, this structure of governance does happen when products are intricate, specifications cannot be clearly defined or difficult getting highly skilled suppliers.

The institutional context of the global value chain dimension focuses on regulations, standards and policies that impact participation and upgrading opportunities. Basically, the function of institution either formal (government) and informal (cultural norms) in shaping the global value chain. For instance, Ghana Cocoa Board (COCOBOD) and Conseil du Café-Cacao (CCC) in Ghana and Ivory Coast respectively oversees the operations of the country's cocoa sector. A strong institution which is characterized by effective rule of law and governance, enables greater involvement in the global value chains.

According to Dollar and Kidder (2017), nations that have robust institutions tends to have firms that are more engaged in complex global value chain activities, which can lead to better upgrading opportunities. The compliance to regulations such as environmental standards, and trade policies affect the ability to upgrade, particularly in process and product upgrading (Ponte & Ewert, 2009). Trade and investment policies including tariffs and non-tariff barriers, free trade agreements, and foreign direct investment (FDI) incentives influence market entry, supply chain configuration and the cost of upgrading investments. Institutional support for skills and innovation such as the availability of vocational training and research institutions, aids the human capital development which is critical for upgrading and adopting new technologies. Furthermore, the compliance with international certifications (e.g. Fairtrade, Organic, etc.) are significant in agricultural commodity especially cocoa, making it a contributing factor for value chain upgrading, as they offer producers access to premium markets.

These four fundamental aspects of global value chain, makes it possible for effectively managing networks within global production, as it allows firms, and countries to uncover avenues for improvement, reduce global value chain risks, and become more competitive within the global marketplace. This improvement within the value chain is defined as upgrading.

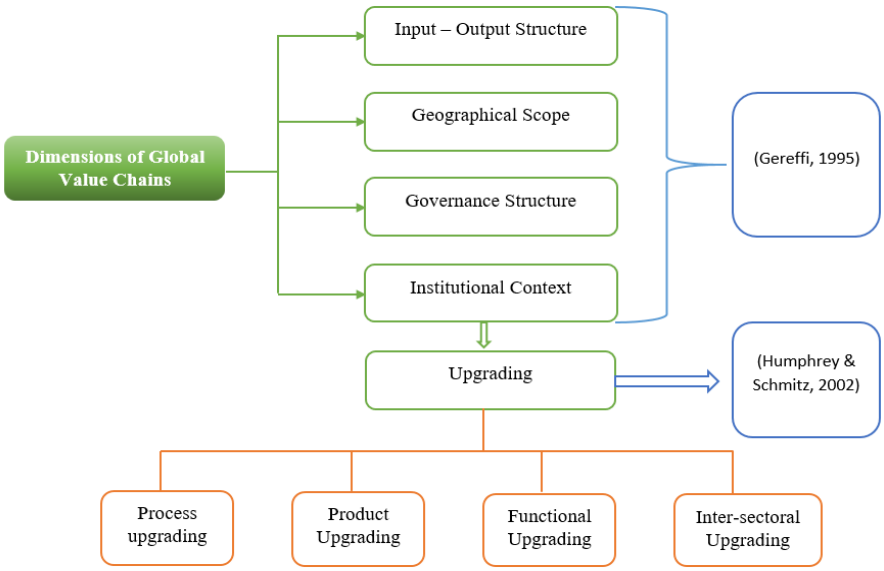

Figure 5. Global value chain dimensions Source: Created by author

The aforementioned four dimensions of the global value chain are crucial for identifying and managing opportunities within global production networks. Therefore, enhancing an entity's position within the global value chain necessitates improvement across these dimensions, which will foster greater competitiveness and resilience in international trade. This insight establishes the foundation

for upgrading strategies, where countries and firms can utilize these dimensions to enhance value capture within the value chain enabling them to improve their international competitiveness.

2.3. Global Value Chain Upgrading

Countries or firms should optimize their activities to augment the benefit in the global value chain participation. This endeavour seeks to create a more sustainable and competitive position in the global market place, a process known as "upgrading" (Humphrey & Schmidt, 2002). Literally, upgrading is to enhance a product or service to a higher standard, in particular, to improve by adding value. Thus, progressing within the value chain to perform a more complex and higher value activities, by improving capabilities through technological advancement, knowledge acquisition and skill enhancement (Armando et al., 2016), or the gradual enhancement of a firm's ability to capture value, thereby improving both its own position and that of its industry within the value chain (Wen & Wen, 2023).

The central idea of upgrading is focused on improving quality, performance and innovation in products, to stimulate wider industrial expansion, and economic gains (Henn et al., 2020; Islam & Polonsky, 2020). The global value chain upgrading by a country can either be backward or forward integration, and the backward integration do impact the forward integration (Stojčić & Matić, 2024). According to Tian et al. (2022), the involvement in backward global value chain integration offers more upgrading opportunities than forward upgrading integration for developing countries, as it allows them to acquire advance inputs through imports.

The work of Humphrey and Schmitz (2002) identifies four types of upgrading within the global value chain, namely process, product, functional and inter-sectoral (chain) upgrading.

- Process upgrading: The process upgrading involves enhancing the production efficiency and productivity. In the context of cocoa value chain, cocoa-producing countries can improve farming practices such as the use of high quality seedlings, fertilizers and invest in better post-harvest handling practices to improve quality.
- Product upgrading is producing high quality products. This signifies a shift towards activities that generate higher value. The development of new product varieties to meet specific market demands of different market segments. In the context of cocoa, it involves a transformation from the production of raw bulk cocoa beans to the manufacturing of cocoa derivatives such as cocoa butter, cocoa powder, and finished cocoa products.
- Functional upgrading entails the adoption of new responsibilities or capabilities within the value chain, with the aim to boost the overall skill level of activities. The adoption of new functions or capabilities includes designing, marketing, research and development. For instance, cocoa farmers could form cooperative to ensure quality standards, obtain certifications, and negotiate better prices with buyers or invest in processing facilities.
- Inter-sectoral or chain upgrading is transitioning into new but related sectors. The actors within the value chain use the skills and capabilities developed in a particular sector to move into other lucrative sectors. For example, capabilities in cocoa sector could be diversified into other agriculture products such as coffee that can be processed and exported, the use of cocoa pods husks and cocoa bean shells to produce organic fertilizer, or compost for other crops.

These value chain upgrading patterns are theorized to drive positive transformation within participating sectors. These transformations manifest as sector-level outcomes such as increased efficiency, higher value-added production, enhanced capabilities, and diversification, all contributing to improved international competitiveness.

While the global value chain upgrading framework delineates four primary types often categorized as economic or industrial upgrading, some researchers have expanded it to encompass not only economic, but also social, environmental and institutional aspects. Economic upgrading emphasizes on enhancing competitiveness through improvements in efficiency, productivity and benefiting from value creation within the value chain.

Social upgrading underscores improvement in labor conditions, ensuring fair wages and employment promoting well-being, throughout the value chain, in other to create positive social impact. Thus, to transform the conditions within the global value chain, by boosting the availability and quality of jobs, and promote fair income distribution (Jindra et al., 2019).

Environmental upgrading seeks to reduce the ecological impacts and promote sustainability within the operations of value chain, through enhanced production and waste re-utilization practices (Navarrete et al., 2020; Khattak & Pinto, 2018; Achabou et al., 2017).

The institutional upgrading focuses on enhancing the structures and capabilities that enable local stakeholders to engage effectively in collaborative efforts (Pipkin & Fuentes, 2017; De Marchi et al., 2020). From my perspective, these types of upgrading in the global value chain are interconnected. For a country or firm, to achieve effective economic upgrading, the other upgrading dimensions must be given due consideration and not be understated. However, Floris et al. (2022) posited that, implementation of a particular upgrading modality whether economic, institutional, social or environmental is dependent on the objective a company, industry or country intends to achieve. The authors further stated that, companies and countries usually adopt the economic or industrial upgrading, in their quest to pursue competitiveness and reposition themselves within the global market.

Kummritz et al. (2017), also emphasizes the fact that, it is imperative to consider policies when intending to pursue upgrading strategies, since policies towards upgrading can serve as a barrier to achieving global value added benefits or a significant enabler. These pathways for upgrading ultimately paves the way for significant benefits, which includes increased revenue generation and enhance international competitiveness.

The review of the aforementioned literature suggests that, while the specific upgrading strategies adopted are contingent upon a country's objective, whether economic competitiveness, sustainability, or others, these objectives complement each other. Also, successful upgrading is contingent upon supportive policies, effective institution and the ability to negotiate power dynamics with lead firms.

2.4. Benefits for Global Value Chain Upgrading for Enhanced International Competitiveness

The shift to higher-value activities within the value chain translate into stronger competitive position for countries and firms in the global marketplace. In the context of cocoa, West Africa is known for its cocoa production benefits from the global value chain, but upgrading their position will further offer more opportunities to improve economic growth, social conditions and sustainable practices.

According to Organization for Economic Co-operation and Development (OECD, 2013), the benefits of participating in the global value chain are not evenly shared across all production phases. Hence, to achieve greater benefits or value, participants must provide intricate and exclusive services. OECD further stated, knowledge-based capital serves as an enabler for firms seeking to capture significant portion of value generated within the chain. A long-term approach which countries and companies can maximize benefit is through position upgrading within the chain (Cattaneo et al., 2013).

Firstly, upgrading within the global value chains leads to increased revenue for the participant. This is because higher value added activities captures a greater proportion of the total economic value produced in the global value chain. By moving beyond primary production and engaging in more sophisticated activities, countries can increase their economic returns from the sector. This is supported by economic theory which suggests that, countries with higher levels of processing and manufacturing tend to have higher export earnings and greater economic growth. At the firm level, higher revenue translates into improved financial performance, which enables reinvestment in research and development, skills development, and technology adoption. These reinvestments further enhance firms' ability to innovate, differentiate offerings, and expand their market reach, ultimately strengthening their international competitiveness. Similarly, countries, through higher-value export will generate increased revenue, which will contribute to a stronger balance of payment and greater foreign exchange reserves. This will, in turn, enable the government to invest in essential areas like infrastructure, education, and innovation, which are fundamental enablers to national competitiveness. In the context of cocoa, by improving domestic processing capabilities, a greater portion of value can be retained within the global value chain. This strategy does not only diversify export offerings, but it also lessens the reliance on fluctuating cocoa prices (Nyadenov et al., 2022).

Upgrading within the global value chains boost employment for participating countries (Feenstra et al., 2019). According to International Cocoa Organization (ICCO) and the International Institute for Sustainable development (IISD), millions of farmers are employed in cocoa production, which means the livelihoods of these farmers are supported by the cocoa sector. Moving into higher-value segments of the value chain such as research and development, processing, and advanced manufacturing leads to job creation, which will increase the need for more workforce, not only in farming but also in processing and export activities. The demand for higher skills, spurred by global value chain upgrading, can incentivize investment in education, vocational training, and continuous learning. A well-educated and skilled workforce is potential for increased wages and contribute to greater social stability and economic growth, both of which are important for sustained international competitiveness.

Furthermore, within the global value chain, governance of the chain activities is exercised by lead firms through their influence, and holds bargaining power over those within the less profitable segment. Upgrading to a higher-value segment in the global value chain will enable firms and countries strengthen their negotiable position, because they will contribute more significantly to the overall value chain. The shift to higher-value segments enables industries become more critical to functioning and success of the global value chain, which increases their bargaining power with lead firms. Accordingly, upgrading reduces dependence on the volatile and low-profit activities, which allows firms and countries to exercise more control over their own development trajectories and obtain a larger share of the value generated within the chain. For enhanced international competitiveness, a stronger negotiating position leads to better prices on exports and more favourable

terms of trade, which increases national income and the profitability of domestic firms in the international markets.

Marcato and Baltar (2017) also emphasized on the fact that, upgrading within the global value chain leads to increased competitiveness through the creation of unique offerings, thereby strengthening firms' positions in international markets. From a long-term perspective, upgrading within global value chain enhances economic transformation. This is achieved by enhancing the role within the chain to promote industrial growth and diversification. In addition, upgrading within global value chain also helps firms to reduce dependence on specific lead firms or low-value activities, which makes domestic economies more resilient to changes likely to occur in global production shifts. In the context of cocoa, there is a shift to environmental and social responsibility often driven by consumer demand, and regulatory pressures. Adopting environmental upgrading allow access to premium markets and cater for environmentally and socially conscious consumers, providing a significant competitive advantage.

In essence, the primary way for countries and firms within the global value chain to achieve significant economic benefits, enhance negotiating power, improve social conditions and increase their international competitiveness, lies in upgrading their position to higher-value activities within the chain. This can be attained through developing capabilities and fostering innovation.

2.5. Theoretical Approaches to Global Value Chain Analysis for Upgrading Solutions

To effectively design strategies for upgrading within the global value chain, it is important to considered theoretical frameworks that explains how value is created, captured, and distributed among global actors. The cocoa sector is influenced by local capabilities, global market structures, institutional frameworks, and international standards. Hence, there is no single theory that captures all these dimensions. This section reviews and integrates vital theories – the global value chain analysis framework, Porter's value chain framework, Sustainability Development Theory, and the Smile Curve Theory – since each presents insights into the dynamics of upgrading, which leads to improved firms and countries competitiveness, and performance in the global market.

The global value chain analysis framework analyzes how global industries are structured. It traces production patterns, links geographically dispersed activities, and assesses the roles of different participants. This helps to understand the creation and flow of value (shared) among various actors within an industry. In cocoa value chain, it comprises multiple stages including cultivation (growing and harvesting cocoa beans), primary processing (fermentation and drying), secondary processing (grinding into cocoa mass, butter, and powder, and product manufacturing (chocolate and other cocoa-based products) (Achaw & Danso-Boateng, 2021; Neilson et al., 2018). A key focus of this framework is the recognition of asymmetric power dynamics, where lead firms, often large multinational corporations operating within the value chain, establish product standards, control market access and even influence environmental practices through governance mechanisms, which fosters uneven bargaining relationships.

The Sustainable Development Theory presents practices aimed to promote sustainability that integrate economic growth, social equity and environmental protection (Mensah, 2019). It enhances competitiveness and market access, especially as consumers are shifting to ethically sourced products. Thus, the theory guides global value chain upgrading strategies by encouraging eco-efficiency, fair

labour practices, and social and environmental responsibilities into business decisions. By aligning value chain operations with sustainable principles, countries can enhance their position.

The Porter's value chain framework emphasizes on firm-level activities to identify opportunities for value creation and distinctive competence from production to market delivery. According to Porter (1985), the activities within the chain can be categorized into primary and supporting activities, to help identify inefficiencies and opportunities for improvement. Within a global context, when applied to the cocoa sector, the framework helps identify where value is added and where interventions might improve competitiveness.

Table 6. Cocoa activities based on Porter's framework Source: Based on (Porter, 1985; Gyankosh, n.d.)

Primary Activities			**Supporting Activities**	
Inbound logistics	Procurement of inputs (seeds, fertilizers) and their distribution to farmers		Procurement	Sourcing fertilizers, equipment, and financial services
Operations	Cocoa cultivation, harvesting, fermentation, and drying		Technology Development	Investment in agricultural technology (e.g. disease resistant coca strains)
Outbound logistics	Collection and transportation of cocoa beans to exporters and processing facilities		Human Resource Management	Capacity building initiatives (Training in sustainable farming practices , improve efficiency, and empower farmers)
Marketing and Sales	Branding, distribution and retail of finished products		Infrastructure	Developing transportation, storage facilities, etc.
Service	Maintaining cocoa product and improving customer experience			

Table 6 shows an operational perspective of a cocoa sector for value creation across the cocoa value chain. This enables the sector assess the current concentration of value (such as operations – primary cocoa production), and identify underutilized areas, which will help address gaps for upgrading purposes. For example, the sector can improve in operations (process upgrading) and invest in branding and marketing (functional upgrading) to enable value capture.

The Smile Theory provides insights on how value is shared among the stages of the chain, and highlights where opportunities for upgrading may occur. This theory proposed by Stan Shih, posited two types of value (higher-value and lower-value). The higher-value is the upstream activities (innovation, research and development, and design) and downstream activities (branding, marketing, and retail) which are captured at the initial and final stages of the value chain. The lower-value (production and assembly) is captured within the mid-level processes of the value chain. The shift to upstream and downstream activities yields significant value capture. The smile curve depicts a "U" shaped value distribution within the global value chain, indicating that firms engaging in the two ends of the curve (upstream and downstream) tend to capture higher value margins, than those focused in the middle stream. Recognizing this distribution, enable firms or countries to discover opportunities for upgrading their operations to boost profitability. To avoid the low margin middle ground, firms must aim to transition either of any ends of the smile curve, thereby enhancing their competitive edge.

According to Aggarwal (2017), for developing countries, the smile curve underscores the importance of policies that promote advancement within the value chain. Investment in learning processes, technology and infrastructure are important for strengthening capabilities in high value activities and

improving economic outcomes. Based on the above premise, firms can leverage the smile curve framework to evaluate their position within the value chain and identify areas for enhancement, such as innovation, improved services or effective marketing strategies. The complex structure and interdependencies that exist within global value chain is also shown by the smile curve. By mapping these relationships, firms can formulate the needed strategies to transition into higher value segments of the chain.

A typical example is Vietnam, which was seen as a low cost manufacturing hub mainly involved in assembling processes, has made significant strides in the electronics sector, transitioning from a middle stream (assembling) to actively pursuing upgrades within the global value chains by attracting foreign investment in research and development centers, developing local design capabilities and promoting the growth of domestic brands (Can, n.d.; Minh, 2024).

Meng et al. (2020) also examines China's and United States' involvement in information and communication technology export related global value chain, where China holds a lower position in the smile curve, mainly involved in labor intensive assembly processes with lower value added, while United States is more active in high value added activities like design and innovation at both ends of the smile curve. This suggest that, countries aiming for global value upgrading must purse innovation driven strategies to shift from low value added production tasks, to more profitable roles within the value chain.

Table 7. Integrated framework for value distribution and upgrading Source: Author based on Gereffi & Fernandez-Stark, 2011; Porter, M. 1985, Mensah, J., 2019; Humphrey & Schmidt, 2002; Meng et al., 2020)

Framework/ Concept	**Smile Curve Theory**	**GVC Analysis**	**Porter's Value Chain**	**GVC Governance**	**Sustainable Development**
Upstream (High Value)	Innovation R&D Product Design	Functional Upgrading into R&D	Technology development Procurement	Relational or Modular to access R&D partnership	Investment in sustainable technologies
Midstream (low Value)	Production Manufacturing Assembly	Process upgrading for efficiency gains	Operations Inbound logistics	Captive governance limits autonomy and profits	Resource efficiency Cleaner production
Downstream (High Value)	Branding Marketing Distribution Customer service	Functional/ Chain upgrading into marketing	Outbound logistics Marketing sales	Market and relational governance offers flexibility	Sustainable marketing Circular economy models

The integration (Table 7) was achieved by synthesizing the theoretical frameworks, each offering a different perspective on the global value chain dynamics. Their concepts were mapped across stages of the value chain (upstream, midstream, and downstream) and linked to specific types of upgrading strategies (process, product, functional, and inter-chain) to provide a scope for analyzing and resolving the value capture challenges in the cocoa value chain. This approach addresses the central problem of limited value capture and competitiveness, which provides a framework to evaluate and implement upgrading strategies that are impactful and sustainable.

The disparities in value captured among actors, where lead firms capture most value in upstream and downstream activities, and leaves low margins for suppliers in manufacturing or raw material production implies that, firms and countries solely focused on midstream activities are at a

disadvantage, unless they transition to higher-value segments. Upgrading opportunities depend on the governance modes and the ability to acquire knowledge and resources from the lead firms or other actors.

Porter's value chain framework shows that firms enhance their competitive advantage by optimization or innovation in supporting activities such as technology development and by differentiating its primary activities, such as product design. For instance, in marketing, actors can participate in international trade expositions to exhibit their products or leverage e-commerce platforms for broader market reach. Furthermore, adapting certification standards such as Fairtrade can facilitate enhanced market reach. Converting cocoa by-products like husks or shells into organic fertilizers represents chain upgrading. To pursue product upgrading, entities can produce cocoa derivatives for target niche markets by developing organic or premium chocolate. The adoption of improved agricultural practices, such as utilizing high-yield and disease-resistant cocoa varieties, presents an opportunity for enhancing the primary activity of cultivation.

Upgrading within global value chain must not only consider profitability but also its impact on labour standards and environmental protection. In the quest to upgrade, there should be a balance between economic goals with social and environmental outcomes. Sustainable upgrading strategies integrate cleaner production technologies, fair labour practices, and resource efficiency.

2.6. Global Value Chain Upgrading Challenges Impacting International Competitiveness

In the global value chain integration and upgrading, countries and firms do face challenges which impedes their ability to fully benefits from the advantages associated with the global value chains. These challenges limit access to new market, reduced international competitiveness, and hinders innovation which affects economic growth and development.

Syafrian (2019) in his study, explored the obstacles to global value chain participation and upgrading experienced by local companies in developing countries. He identified four primary challenges: constrained value acquisition, operational inefficiencies, the prevailing Neoliberal system, and detrimental policies and institutions. He connects the issue of constrained value acquisition to the Smile Theory, which posits that manufacturing/production activities which is commonly performed by many developing countries generate the least value added compared to other activities such as branding, retail, research and development that offers higher value.

Financial pressures, insufficient scale economies, misdirected investment, short-term relationships are causes of inefficiency from a company's standpoint. Other scholars have also noted that, poor infrastructure, high trade costs, and weak industrial policies are further obstacles to upgrading (Pushp & Ahmed, 2023; Kuroiwa, 2016).

Low value addition, governance and power dynamics, institutional and policy barriers, and environmental and social issues are the four primary categories of upgrading challenges for producing countries in the relation to the cocoa value chain.

Table 8. Challenges of global value chain upgrading by cocoa-producing countries

Challenges	Factors	Meaning/ criteria	Source
Low value addition	Dominance of raw bean export	Over reliance on raw cocoa beans	(Naydenor et al., 2022; Grumiller & Grohs, 2022)
	Limited domestic processing capacity	Lack of processing infrastructure and expertise	(Naydenor et al., 2022; Barrientos & Asenso-Okyere, 2009)
Governance and power dynamics	Imbalance of power	Lead firms dictating terms of trade and market prices	(Gayi & Tsowou, 2016; Barrientos & Asenso-Okyere, 2009; SER Report, 2018)
	Certification standards and market entry barrier	Compliance with stringent international certification standards	(Martins et al. 2023; Mathe et al., 2022)
Institutional and policy barriers	Government policies	Inconsistent government policies, corruption, bureaucratic hurdles	(Fountain & Huetz-Adams, 2022)
	Trade agreements		(Pushp & Ahmed, 2023; Kuroiwa, 2016)
	Global market regulations	Fluctuating global commodity prices, changing consumer preferences	(Grumiller & Grohs, 2022; Cocoa Barometer, 2022)
Environmental and social challenges	Deforestation	Clear forest for new cocoa plantation as a result of high demand	(Parra-Paitan et al., 2024; Kroeger et al., 2017)
	Child labour	Reliance on child labour especially during peak sessions.	(UNICEF, 2018; Grumiller & Grohs, 2022)
	Lower farmer incomes	Income often below poverty lines	Vinci et al., 2024; Grumiller & Grohs, 2022)

These identified challenges, which impedes upgrading within the cocoa global value chain are consistent with the integrated framework in Section 2.5, which aims to facilitate strategies for enhancing value distribution and upgrading across the value chain. For instance, the challenge of low value addition can be analyzed by the Smile Curve Theory, which posits that countries may be constrained in midstream low-value segments, thereby highlighting the need for upgrading via Porter's framework. Governance and power dynamics are explained by the global value chain governance structure (specifically, captive governance limiting autonomy), which restrict access to upgrading and value capture. The institutional and policy barriers reflect weaknesses within the institutional context dimension of the global value chain, where a lack of enabling policies directly reduces upgrading capacity. Finally, environmental and social challenges align with Sustainable Development Theory, emphasizing the importance of integrating environmental and social conditions into the value chain.

The aforementioned challenges underscore the necessity for a multi-theoretical approach, as it clarifies the structural, institutional, and capacity-related barriers that inhibits upgrading within the value chain, consequently impacting international competitiveness. Accordingly, effective upgrading strategies must address these challenges through coordinated policy, resources, market and governance interventions.

2.7. Resources and Capabilities for Global Value Chain Upgrading

Business operations within any institution or establishment are contingent upon the availability of resources and capabilities, underscoring their critical importance. Resources are defined as both

physical and non-physical assets that a firm possesses and manages, which allows it to compete effectively and achieve objectives, while capabilities on the other hand is the unique combination of resources, skills and competences a firm possess, that empowers it to effectively perform its core functions and achieve business objectives (Barney, 1991).

Successful upgrading does not only require adequate resources, but also the development of dynamic capabilities that makes it possible for firms to adapt, learn, and innovate in response to changing market demand and competitive pressures. This has made resources and capabilities essential in determining a firm's ability to gain a stronger position within the global value chain.

According to OECD (2013), activities of value chain that offers greater value are those that rely on human expertise and knowledge-based capital. In their 2023 report, the OECD identified three main categories of knowledge-based capital: computerized information, innovative property and economic competencies.

Table 9. Knowledge-based capital for global value chain upgrading Source: OECD (2013)

Knowledge-based capital	**Capital categories**
Computerized information	Computer software
	Computerized database
Innovative property	Scientific research and development
	Creative property
	Design
Economic competencies	Brand equity
	Firm specific human capital
	Organization structure

The upgrading patterns are determined by the type of knowledge-based capital. (Table 10 briefly highlights)

Table 10. Global value chain upgrading patterns and corresponding type of knowledge-based capital
Source: Author based on OECD (2013)

Upgrading pattern	**Category of knowledge-based capital**	**Means**	**Aim**
Process	Computerized information	Systems and software	To improve the efficiency and accuracy of production management.
	Innovative property	Leveraging expertise	To streamline production lines.
Product	Computerized information	Software	To improve design capabilities, utilize database to track customer preference allowing for the creation of new products or service that meet customer demand.
	Innovative property	Advanced technology	To raise quality.
	Economic competencies	Marketing skills, distribution networks, brand image	Ability to quickly launch novel products.

Function	Innovative property	Non-manufacturing capabilities (marketing, product design, branding, research and development)	Increased competitiveness, higher value addition.
Chain	Economic competencies	Flexible organizational structure, superior managerial skills	To quickly identify opportunities and risk. Shift core competencies to new areas.

The study found a strong correlation between a country's knowledge-based capital and their potential to upgrade within the global value chains and obtain greater export benefits. All categories of knowledge-based capital positively influence global value chain upgrading. However, in examining the export competitiveness, economic competencies have the most significant effect, with innovative property and then computerized information following.

Bamber et al. (2014) emphasized the determinants that influence developing countries' competitive position in the global value chains. These elements encompass resources and capabilities that are necessary for global value chain upgrade. According to the authors, the ability of developing countries to increase the value derived from their agricultural products within commodity value chains is constrained by the various quality and food standards they must meet for upgrading. However, some developing countries have taken steps to improve their positions within the global value chains. They identified factors affecting competitiveness in the agricultural commodity value chain for developing countries as:

- Production capacity: encompassing workforce skills, quality standards and certifications.
- Infrastructure: transportation, energy, water, etc.
- Industrial development: reflecting the maturity of the industry.
- Economic context: including the availability of financial resources.

These factors are often shaped by country-level policies and investments, which can either enable or constrain a country's ability to effectively participate in and benefit from the global value chains. Consequently, the interaction between these factors and the theoretical approaches discussed in Section 2.5 (e.g. global value chain framework) determines the extent to which upgrading strategies can lead to desired sector-level outcomes. For instance, a favourable economic context, such as access to financial resources, can facilitate investments in new technologies and processes, enabling product upgrading and resulting in sector-level outcomes like increased production and export of higher-value cocoa products. Similarly, a strong production capacity (skilled workforce) is important for functional upgrading, allowing cocoa-producing countries to move into higher-value activities and leading to sector-level outcomes such as increased revenue and greater control over the value chain. Likewise, adequate infrastructure which is a prerequisite for upgrading enabling more efficient and cost-effective production methods.

In the cocoa sector of cocoa-producing countries, successful upgrading should result in outcomes such as:

1. Increased export of processed cocoa products: A higher percentage of cocoa exported as finished product (chocolate) and semi-finished products (cocoa butter, powder), rather than raw beans.
2. Growth in cocoa processing and related industries: An increase in the number of local firms involved in cocoa processing, marketing, and related activities, leading to job creation within the sector.

3. Higher export prices: Increased average prices for cocoa products due to value addition through processing and branding.
4. Increased market share: A larger share of the global market for cocoa products held by cocoa-producing countries.
5. Diversification into related sectors: the expansion of the cocoa sector into related industries, such as cosmetics or pharmaceuticals that utilize cocoa by-products.
6. Improved quality and branding: Enhanced reputation and recognition of cocoa products from cocoa-producing countries due to improved quality and effective branding strategies.

Table 11. Factors affecting developing countries competitiveness in global value chain Source: Bamber et al. (2014)

Factor		Description
Productive Capacity	Human capital	• The cost and availability of labor is essential for lower-value labor-intensive functions. As cheaper locations join value chains, those already participating must increase their capabilities or specialize in particular market segments. • Upgrading worker skills becomes essential to remaining competitive (Gereffi et al., 2011).
	Standards & certification	• Codified public and private product and process requirements used to standardize supply across multiple suppliers (Kaplinsky, 2010). • Standards can drive upgrading by disseminating information on improving quality and productivity (Diaz Rios & Jaffee, 2008); yet, developing country firms often lack the capital and expertise to master multiple certification requirements (OECD, 2008).
	National system of innovation [a]	• Flows of technology and information among people, companies and institutions that contribute to innovation and technology development (OECD, 1997). • This is important for closing technological gap to support upgrading of domestic and foreign firms (Farfan, 2005). Required at all stages of the value chain to drive efficiency and quality improvements.
Infrastructure & services	Transportation, ICT, Energy & Water	• Impact of the cost and quality of these factors is compounded as fragmented production means inputs and intermediate goods must be transported between multiple locations. • ICT facilitates the transmission of codified design specifications between actors in product-based chains and is the main medium for participation in cross-border service exports. Energy drives cost competitiveness in capital-intensive assembly and processing segments of the chain.
Business environment	Macro-economic stability & public governance	• Macroeconomic stability exists when key economic relationships are in balance. Exchange rate volatility affects costs paid for inputs and price netted for exports. • Governance includes traditions and institutions by which authority is exercised (e.g. rule of law, corruption, government effectiveness) (World Bank, 2013). Volatility can affect the timely delivery of goods and raise risk of inventory theft (WEF et al., 2013).
	Ease of opening a business & Permitting/ Licensing	• The procedures, time and cost for a new business to start up and operate formally and the process to obtain construction permits, water and mineral extraction permits, etc. • Comparatively lengthy procedures can deter FDI due to other potential country alternatives, while undermining the development of domestic firms.
	Access to finance	• The possibility individuals or enterprises can access financial resources based on use and accuracy of credit registries and effectiveness of collateral and bankruptcy laws. • Essential for investments required to meet standards and other demands of GVCs. Lack of capital undermines potential of small and medium enterprises (SMEs) to engage in GVCs.
Trade and investment policy [b]	Market access	• Extent of tariffs and import restrictions in potential target markets affect potential to engage with different end-markets.
	Import tariffs	• Tariffs charged on imported components, services and capital equipment required for the production or provision of exports become taxes on exports in GVCs.
	Export-import procedures	• Complexity of and time taken to complete customs procedures managing imports and exports of products and services reduces reliability and timeliness of delivery.
	Border transit times	• Time taken to move products and services through border crossings. Inefficient border crossings affect timeliness of product delivery to next stage of GVC or end-market.
	Industry-specific policies	• Investment & export promotion policies designed to support specific industry participation and upgrading in specific segments of different value chains (Gereffi & Sturgeon, 2013).
Industry Institutionalization	Industry maturity & coordination	• Experience of firms in participating in GVCs, presence of key chain actors such as input and service providers and the establishment, influence and representativeness of an industry association to reduce transaction costs for meeting requirements.
	Public-private coordination	• Linkages and cooperation among private sector, government, educational institutions and others industry stakeholders. • Essential to rapidly identify and overcome challenges to chain participation.

The factors are therefore integrated into the upgrade modes in Table 12 showing some criteria and conditions relevant for upgrading. However, it is worth considering that the factors and conditions for interconnected and interdependent.

Table 12. Factors and conditions for global value chain upgrading Source: Author

GVC Upgrading	Factor	Criteria	Conditions for Implementation	Alternative Upgrading Options
Product Upgrading	Human Capital	Skilled labour for product development and innovation. **1**. Food science and Technology expertise **2**. Industrial processing expertise **3**. Quality assurance evaluation	**1**. Specialized training in cocoa processing. **2**. Research and development in chocolate and specialty products. **3**. Quality control and food safety expertise.	**1**. Chocolate manufacturing (By moving beyond cocoa beans to finished chocolate bars). **2**. Premium cocoa butter and powder productions. **3**. Specialty cocoa products (Organic, Fairtrade).
	Standards and certifications	Meeting international quality standards. **1**. ISO 22000 & HACCP compliance **2**. Fairtrade, Rainforest Alliance certification. **3**. EU & US FDA standards.	**1**. Compliance with Organic, Fairtrade, rainforest alliance certifications. **2**. Investment in certification & traceability.	**1**. Organic certification to get access to premium markets. **2**. Sustainable and standards compliance for ethical branding and competitiveness.
	Research and development capabilities	**1**. High performance cocoa varieties for better flavor, lower fermentation time). **2**. Innovative cocoa processing methods such as cold-pressed cocoa butter. **3**. Value-added cocoa derivatives (cocoa flavonoids for health supplement, and coca infused beverages).	**1**. Partnerships with research institutions for processing techniques and value added products. **2**. Government and private investment in cocoa research and development.	**1**. Develop value-added cocoa derivatives (liquor, flavored powders). **2**. Introduce fortified cocoa-based nutritional products.
Process	Process technology and infrastructure	Efficient production **1**. High-efficiency cocoa grinders to reduce processing costs. **2**. Solar powered systems. **3**. Cold storage for cocoa butter and powder to maintain quality.	**1**. Energy efficient cocoa processing plants. **2**. Build regional cocoa processing hubs with the most advanced and high-quality technology.	Establish local grinding plants. Implement traceability for supply chain transparency.
Functional Upgrading	Access to finance	Investment in cocoa processing technologies.	Government backed low interest loans. Foreign investment incentives for local cocoa processing.	Government supported funding for cocoa small and medium scale enterprise. Microfinance for farmer cooperatives.
	Branding and marketing	Brand positioning (promoting African origin chocolate) Digital marketing	Brand development Participating in international trade fairs.	Premium chocolate brands. E-commerce platforms for African chocolate.

Chain	Expansion into related sectors	Diversification opportunities 1. Pharmaceutical cocoa products. 2. Cocoa based cosmetics. 3. Confectionery expansion 4. Cocoa waste utilization (e.g. biofuels from cocoa husks)	Encourage foreign direct investment in downstream cocoa industries. Develop public-private partnerships to establish cocoa-based pharmaceutical and cosmetic industries.	Cocoa biofuel production (reducing waste and creating energy solutions)

Resources and capabilities constitute the internal drivers of upgrading, determining the capacity through which a country or firm can upgrade within the global value chain. The resources and capabilities discussed in this section extend and support the multi-theoretical approach. Porter's value chain framework aligns with resources (such as processing equipment, finance, infrastructure) and capabilities (e.g., capabilities in marketing, research and development) as significant for strengthening internal value-added functions. The smile curve highlights knowledge-based capital as a capability-driven asset. The ability to shift governance structure (e.g. from the captive mode) depends on capabilities such as product manufacturing (ability to perform higher-value activities within the chain), and Sustainability development theory requires technological resources and social capabilities.

Furthermore, each barrier to upgrading identified in Section 2.6 also directly corresponds to a gap in resources and capabilities, as indicated in Table 13, thus emphasizing the importance of firm-level or sector-level investment in tangible resources and intangible capabilities (human capital, innovation, infrastructure and technology) to enable value chain upgrading.

Table 13. Barriers to upgrading and the corresponding resources/capabilities need Source: Author

Barrier	**Resources/ capabilities need**
Low value addition	Processing infrastructure, skilled labour
Governance imbalance	Product development, innovation and research, negotiation capability
Institutional gaps	Policy support skills
Market access issues	Marketing skills, certification compliance
Sustainability compliance	Training programs, certifications, knowledge of environmentally friendly farming and processing techniques

The alignment of resources and capabilities with the broader theoretical model, reinforces the fact that internal firm-level and sector-level strengthening is as important as addressing external governance structures and market dynamics in realizing high-value participation in the global cocoa value chain.

2.8. Conceptual Framework

The literature review gives understanding of how cocoa-producing countries are positioned within the global value chains, and the challenges they face in upgrading. Additionally, it mains to explain the interconnectedness of global production. The emphasis on governance shows where the control dynamics between producers and large multinational firms may be, shape the opportunities for value

creation and distribution. In the global cocoa value chain, governance tends to be captive as cocoa producers depend on lead firms for market access, finance, etc., a situation that limits autonomy and earning potentials for producers. The central subject that the review examines is upgrading, stressing on the fact that, moving beyond raw material exports toward higher-value activities like cocoa processing and chocolate production are essential for economic growth and enhanced international competitiveness.

A review of the four pathways of upgrading (process, product, functional, and chain) was considered, showing how each can lead to better integration and increase returns within the global market. Theoretical models which includes Porter's value chain and Smile Curve Theory, frame the discussion on how value is distributed unevenly along production stages with upstream and downstream activities achieving the maximum value capture. The review points out some challenges which includes domination of low value activities, inefficient policies and social and environmental issues acting as barriers to upgrading within the global value chain. To solve these challenges necessitates enablers such as improvement in infrastructure, innovation, finance, effective policies and standards. Ultimately, to upgrade in other to have stronger position in the global market, there must be a balance in profitability with social and environmental long-term viability.

Following the review of literature, a conceptual framework was developed (Figure 6). The framework shows the factors that influence and shape global value chain upgrading, as well as its potential outcomes. Consequently, it shows how various elements interact to help a country move up the value chain in global production to capture higher values that the chain provides. The drivers or enablers of the global value chain upgrading includes

- Resources: human capital, financial resources, natural resources
- Capabilities: skills, knowledge, and technological capabilities
- Policies: government policies that support upgrading
- Technology: access to and the adoption of new technology

These factors work together and impact the way a company or country can upgrade to achieve sustainable development benefits. To improve the limited benefit that cocoa-producing countries generates from cocoa production, there is the need to enhance their role, by developing strategies that are grounded in the global value chain frameworks, which emphasizes the importance of adding value.

Firstly, to enhance efficiency in the context of cocoa, process upgrading involves improving farming practices, fermentation and drying techniques. This is achieved by using high quality seedlings and sustainable methods for post-harvest handling.

Instead of just exporting bulk cocoa beans, product upgrade focuses on shifting to providing higher-value derivatives (cocoa paste, butter and powder) to cater varied market demands.

Functional upgrading entails developing marketing, branding, research, and processing capabilities, which empowers these countries to exert greater level of control over chain activities.

Furthermore, the chain upgrading fosters diversification into other related sectors. For instance, the diversification into other related sector (such as utilizing cocoa pod husks for the production of organic fertilizer, or manufacturing cocoa-based pharmaceuticals) can mitigate the dependence on production and export of raw cocoa beans. In this instance, cocoa-producing countries will have a

more robust and resilient economic base, which will reduce the vulnerability to price fluctuations that affect raw cocoa market.

The conceptual model integrates governance, input-output structure, geographic scope, and institutional context which were presented by Gereffi & Fernandez-Stark (2011) to delineate upgrading opportunities. Robust institutional support from organizations such as Ghana Cocoa Board (COCOBOD) and Conseil du Café-Cacao (CCC), alongside enabling trade policies and international certification, is important for countries aiming to achieve sustainable participation in the cocoa market and enhance their international competitiveness.

Addressing limited processing capacity necessitates investment in infrastructure, which is facilitated by favorable financing schemes and public-private partnerships. In scenarios of constrained financial resource, improving access to affordable credit through cooperative banking system can empower smallholder farmers and cooperatives to adopt modern practices conducive for upgrading.

To mitigate the impact of price volatility, a shift to higher-value activities such as semi-processed and finished products, or product diversification, can contribute to income stabilization through value capture. Developing stronger cooperatives will enable better price negotiation capabilities, while fostering the development of domestic lead firms can help manage more substantial market shares.

Training and technology initiatives will enhance the skills in processing, quality control, and marketing, to address human capital constraints.

Finally, the adoption of sustainable farming practices and certification schemes will improve access to market while simultaneously safeguarding ecosystems in response to environmental pressures.

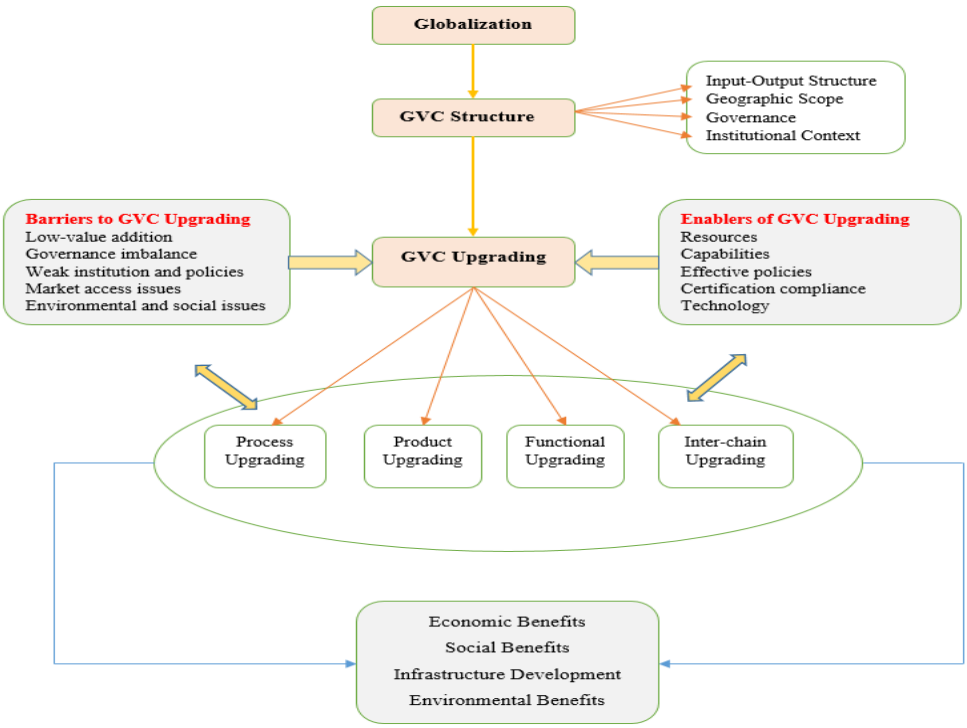

Figure 6. Conceptual framework Source: Author

3. Methodology for Cocoa Value Chain Upgrading Factors and Conditions Research

The methodological approach of this research was designed to examine conditions for upgrading the cocoa value chain for enhanced international competitiveness. Notwithstanding their status as leading global cocoa-producers, Ivory Coast and Ghana predominantly engage in the production stage of the cocoa value chain, a position that limits their potential for greater value capture and enhance their international competitiveness in global markets. The methodology of this research aligns with the research objectives, theoretical framework and literature review.

Research Questions

The analysis of global value chain governance, upgrading strategies, and factors influencing competitiveness provides the necessary framework for addressing the research questions. The conditions that determine successful upgrading, define the economic and structural context in which Ivory Coast and Ghana operate within the global cocoa value chain. It is these elements that guide the formulation of the four research questions to ensure that the research remains grounded in established theoretical principles.

1. **What are the challenges limiting value capture in the cocoa value chain for Ivory Coast and Ghana?**
   This question is linked to governance constraints, institutional barriers, and power imbalances within the global cocoa trade. The theoretical analysis shows how producing countries remain in low-value activities due to structural limitations, limited bargaining power and dependence on lead firms.
2. **What are the factors and conditions that influence the enhancement of competitiveness through upgrading strategies (product, process, functional and chain)?**
   This addresses the concern of enabling cocoa-producing countries to move beyond reliance on raw material production. The analysis of process efficiency, product differentiation, functional specialization, and moving into related industries, provides the conceptual reasoning behind the exploration of this research question. Understanding the factors or conditions that drive or hinder these upgrading pathways is important for formulating strategies to improve the long-term competitiveness and sustainability of the cocoa sector.
3. **What extent are the theoretically established conditions for successful value chain upgrading present in the cocoa sector?**
   This research question investigates the extent to which the enabling factors, identified in the literature, exist within the cocoa industries of Ivory Coast and Ghana. The conceptual framework emphasizes necessary conditions such as: access to finance, investment in infrastructure, effective policy support, and institutional capacity. This question allows the researcher to examine how these conditions correspond with actual circumstances, and whether they are sufficiently addressed within the policy framework of Ivory Coast and Ghana.
4. **What role do governance structures and policies play in shaping the upgrading opportunities?**
   The theoretical background explains how lead firms and global market regulations facilitate or hinders upgrading potential. Consequently, the influence of trade policies, regulatory frameworks and international standards on the ability of cocoa-producing countries to move up the value chain is paramount.

Research Design

The research sought a comprehensive understanding by employing both qualitative and quantitative strategies for data collection, on the conditions that define the relevance of alternative solutions for upgrading the cocoa value chain. It focused on the analysis of the cocoa industry in Ivory Coast and Ghana. The qualitative approach adopted explored perceptions, challenges and strategies for upgrading the cocoa value chain, while the quantitative approach measured the importance and impact of the identified conditions for upgrading.

Research Method

The research was based on the outcomes of the literature review, which highlighted some key dimensions for empirical investigation: market trends, production practices and policy frameworks. These dimensions correspond to the barriers, enablers and upgrading pathways of the cocoa value chain. The study collected data through interviews (semi-structured) and surveys to address the following:

- Market trends: By exploring the role of cocoa-producing countries (Ivory Coast and Ghana) in the global cocoa value chain, diversification and value addition, growing consumer demand, which are consistent with the Smile Curve Theory, and the Sustainability Development Theory.
- Production practices: Investigating processing practices, infrastructure factors, skill gaps, trade regulations, financial accessibility, etc. reflecting upgrading enablers and challenges. This is also consistent with Porter's value chain framework, and the global value chain framework.
- Policy framework: Assessing stakeholders' perception on policy interventions both local and international, that affect value capture, governance, and upgrading pathways, aligned with the theoretical frameworks, and resources and capabilities identified by Bamber et al. (2014) and OECD (2013).

In addition to the above approach, secondary data were gathered to provide insights and validate findings. Specifically, the 2019 Global Competitiveness Index (GCI 4.0) data from the World Economic Forum, and International Trade Centre (ITC) Export Potential Map were utilized to analyze country-level competitiveness factors and untapped export potential that influence cocoa value chain upgrading. The Global Competitiveness Index (GCI 4.0) data supports the examination of barriers and enablers of upgrading by providing cross-national indicators on institutional strength, infrastructure, innovation (research and development), and access to finance – all factors identified in the literature review and by respondents in Ivory Coast and Ghana. The analysis of the stages of the cocoa value chain activities based on Harmonized System codes were used to determine value capture, and export potential for Ivory Coast and Ghana. The International Trade Centre (ITC) Export Potential Map facilitates the examination of untapped value, which can also be linked to alternative cocoa-based industries, thereby influencing the cocoa value chain upgrading pathways.

Sampling Method, Sample Size, and Empirical Process for Research

A purposive sampling method was used to select participants deemed pertinent for this research, aiming to gain valuable insight. The qualitative phase involved semi-structured interview with nine stakeholders, while the quantitative phase utilized surveys with 120 respondents from diverse roles across the cocoa value chain. The qualitative research explored perceptions and identify key variables, while the quantitative generalize the qualitative findings to the larger population and quantify the

importance of factors identified in the interviews (i.e. qualitative findings informed the development of the survey questions). The multiple stakeholder approach adopted for data collection, helped to address the research questions on upgrading cocoa value chain for enhanced international competitiveness in Ivory Coast and Ghana, given the direct and indirect influence of these stakeholders on the cocoa value chain. Table 14 presents the categories of participants that were selected for the research, together with the rationale and sampling criteria, while Figure 7 shows the process for the empirical research.

Table 14. Interview respondent category and sampling criteria

Category of participant	Justification for selection	Sampling criteria
Cocoa farmers	Primary producers of the raw material (cocoa beans) and their practices directly influence the quality, quantity and sustainability of cocoa production.	Own 2 or more hectares of cocoa farm.
Cocoa processors and manufacturers	The key actors in value addition	Experience in cocoa processing of at least 3-5 years.
Industry experts	Knowledge of market trends and global value chain upgrading	Consultancy or research experience in cocoa industry.
Cocoa Board Officials	Regulatory role in cocoa policies	Officials in cocoa sector regulations, and quality control.
Financial institutions personnel	Offers investment and credit for cocoa production.	At least 2 years of involving in financial cocoa related operations.
Marketing professionals	Knowledge in branding and marketing positioning.	Experience in cocoa product marketing.
Investors/ Entrepreneurs	Potential drivers of diversification	Engaged in cocoa-based industries.

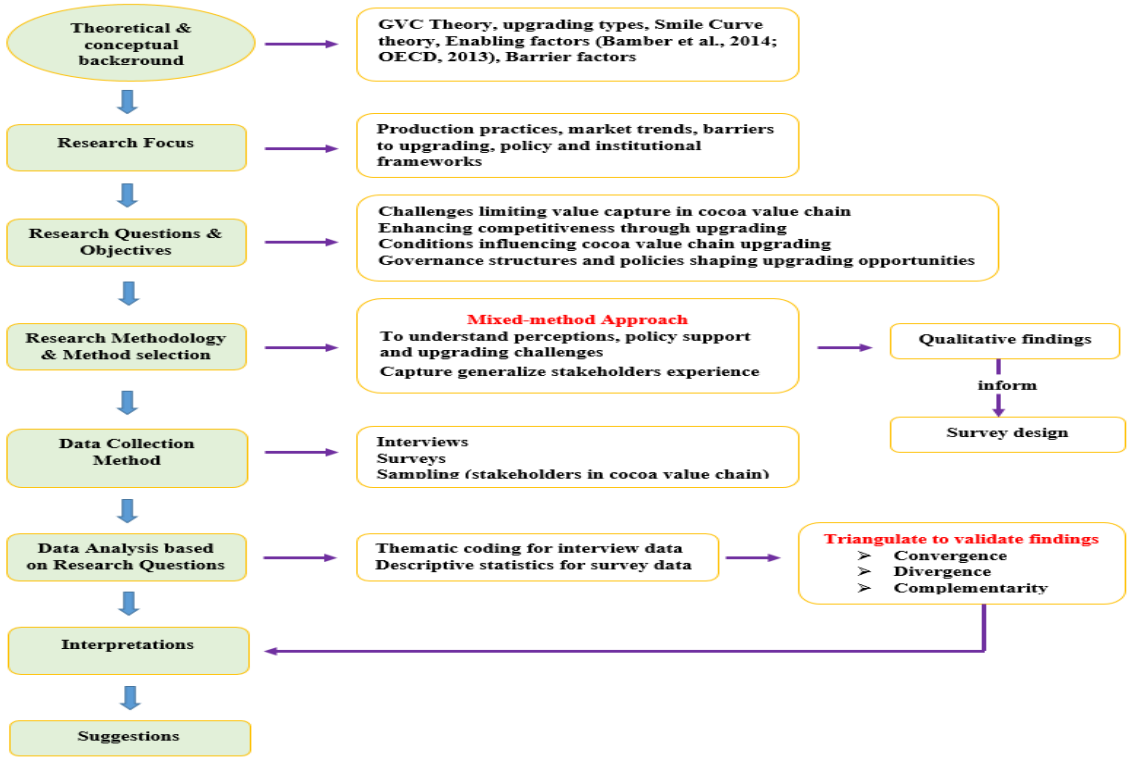

Figure 7. Empirical research process Source: Author

Data Collection and Analysis

The research data analysis was structured to address the four research questions through the collection of qualitative (interview data) and quantitative (survey data), with analysis methods selected to align with the data type and aspects of the cocoa value chain that was investigated.

The qualitative data gathered through semi-structured interviews with nine stakeholders were analyzed using MAXQDA. Codes were developed, from the ideas in respondents' answers. The coding process focused on identifying specific challenges within the cocoa sector of Ivory Coast and Ghana that impact their value chain upgrading (e.g. unstable electricity, inadequate processing infrastructure, financial accessibility issues, and gaps in skills) and opportunities (e.g. policy incentives, innovation into alternative cocoa-based industries). The codes were illustrated with direct respondents' quotes and presented in thematic coding tables including relevance.

The quantitative data, obtained from surveys administered to 120 cocoa value chain stakeholders were analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics, mainly mean, were used to examine the patterns in cocoa production practices, infrastructure factors, financial accessibility, certifications and perceptions on policy support. This analysis focused on current positioning in the cocoa value chain, upgrading activities and challenges experienced by actors. Figures summarizing the statistical findings are presented in the empirical analysis in Chapter 4. To strengthen the validity of findings, interview and survey data were triangulated to indicate areas of convergence, divergence or complementarity between qualitative and quantitative to provide understanding of the cocoa value chain upgrading. Data collection instruments (i.e. survey and interview questions) are provided in the appendices.

Table 15 presents the data collection matrix developed to guide and align the empirical phase of the research with the theoretical and conceptual framework established in Chapter 2, with the aim of facilitating the assessment of cocoa value chain upgrading. First, the research questions were derived from the problem statement and identified gaps, and subsequently linked to the upgrading patterns, challenges and outcomes.

Table 15. Data collection methods for cocoa value chain upgrading factors and conditions research

Condition for Upgrading	**Data Source**	**Questions to be answered/ Research Question (QR) covered**		**Data analysis Guidance**	**Theoretical reference**
Skilled workforce for cocoa processing and product innovation	Interview with cocoa processors and industry experts	**1.** In your opinion, what specific skills are needed in cocoa processing? **2.** Do you think vocational training, university partnerships, private sector investment in employee training, and government-funded technical programs can improve workforce skills in the cocoa industry, and which will be most effective?	**QR 2** **QR 3**	Identify skills gaps and needed training programs.	Human Capital and Knowledge-based capital as drivers for upgrading (OECD, 2013) Upgrading requirement (Humphrey & Schmitz, 2002)
	Survey with cocoa farmers and processors.	**1.** To what extent are the following skills lacking in cocoa processing? Technical, Managerial, etc. **2.** Rate the accessibility of training in cocoa processing based on the following		To know the industry-wide skill gaps and training accessibility.	

		factors: availability of training centers, cost of training, etc.			
	Secondary Data (WEF GCI Index 4.0)	Skill set of graduates (as benchmark) for value addition. This will be compared with competing cocoa processing countries if workforce is sufficient for upgrading the sector.		Identify the skill set levels of the country for value addition.	
Infrastructure for efficient cocoa processing and logistics	Interview with Cocoa processors, farmers, national cocoa boards	**1.** In your experience, which infrastructure factor (electricity supply, road and transportation access, storage and warehousing facility, water supply, and digital infrastructure) mostly affect cocoa upgrading? **2.** What improvement in these factors will positively impact cocoa processing the most?	**RQ 1** **RQ 3**	Identifying bottlenecks in cocoa infrastructure	Institutional support and infrastructure as prerequisites for upgrading (Bamber et al., 2014)
	Survey with farmers, processors	**1.** Rate the impact of the following infrastructure challenges (electricity supply, road and transportation, water supply, etc.) on cocoa processing. **2.** Evaluate the infrastructure issues that impact value addition the most? (electricity supply, road and transportation, water supply, etc.)		To identify critical infrastructure weaknesses.	
Financial access for cocoa upgrading investments	Interview with financial institutions, Cocoa Board officials	**1.** Could you tell me; what financing options are available for cocoa production? And in your opinion what financial barriers (high interest rate, collateral requirement, lack of government incentives, etc. most limits access to finance in the sector?	**RQ 3** **RQ 4**	Identifying financial barriers preventing value addition	Access to finance as a condition for upgrading (Bamber et al, 2014)
	Survey with farmers, cocoa processors	**1.** To what extent do cocoa processors rely on the various types of funding (Bank loans, government subsidies, etc.) available to them. **2.** Evaluate the extent to which these financial barriers (high interest rate, collateral requirement, lack of government incentives, etc.) prevent investment in cocoa upgrading. **3.** To what extent do you agree that the following financial options (Government back loans, subsidies and grants, commercial loans, etc.) are accessible for cocoa production. **4.** To what extent do you agree that each of the following cocoa processing activities needs increased investment.		Assessing financial difficulties and preferred funding sources	
Trade Policies and	Interview with Cocoa	**1.** In what ways do trade regulations (Quality standards, Food safety	**RQ 4**	To identify challenges in	

Certification compliance	Board Officials	regulations, sustainability and ethical sourcing, trade tariffs) affect cocoa value chain upgrading. **2.** Do you believe government policies support or hinders the growth of cocoa processing businesses, and in what ways?		export policies and certification requirements.	Role of governance & certification standards in upgrading (Gayi & Tsorwu, 2016) Impact of trade policies on market access (Grumiller & Grohs, 2022)
	Survey with cocoa processing firms, Cocoa Board officials	**1.** Rate the impact of the following trade regulations (Tariffs, price volatility, quality standards, etc.) that influence cocoa value chain upgrading. **2.** Do you believe certifications will improve the competitiveness of locally processed cocoa products in global market. **3.** Please rate the extent to which you agree that the following certification requirement (Fairtrade, Rainforest Alliance, Organic, etc.) act as barriers to international market access for local cocoa processors. **4.** Based on the following policy interventions rate how helpful they would be in upgrading the cocoa value chain. **5.** To what extent do you agree that the following certification compliance (Fairtrade, Rainforest Alliance, Organic, etc.) is costly to the cocoa sector?		Trade obstacles and estimate certification burden.	
	Secondary data: Tariffs for cocoa products. Data source: Food and agriculture organization of the United Nations.				
Market access and Branding for cocoa based products	Interview with marketing professionals, cocoa board officials	**1.** Do you think locally processed cocoa products have been competitive in global market? **2.** Based on your experience, what branding or marketing strategies could improve international competitiveness?	**RQ 2** **RQ 3**		Branding and marketing differentiation as upgrading strategies (Porter, 1985) Smile curve theory on value capture.
	Survey with marketing professionals, processors	**1.** In your opinion, how well-known are local cocoa brands internationally? **2.** To what extent do you agree that the following branding/ marketing strategies (digital branding, trade fairs, etc.) are effective in promoting locally cocoa product to global market and enhance international competitiveness.		To measure brand recognition and effective marketing channels.	
	Secondary data (ITC)	Analysis of cocoa exports from Ivory Coast and Ghana. For HS code: 1803 - 1806		To identify expansion opportunities	

Diversification in cocoa-based sectors (Pharmaceuticals, Cosmetics, Biofuels)	Interview with industry experts	**1.** What potential business opportunities do you see for diversifying cocoa products? **2.** In your opinion, are investors/ entrepreneurs drawn or attracted to other sectors related to cocoa? **3.** What policy incentives do you believe could promote investment in other sectors related to cocoa?	**RQ 2**	To identify emerging cocoa-based industries.	Chain or inter-sector upgrading as pathway to diversification (Humphrey & Schmitz, 2002) Economic upgrade to enhance international competitiveness (Floris et al., 2022)
	Survey with investors, entrepreneurs, processors	**1.** How would you rate the market potential of the following alternative cocoa-based industries (pharmaceuticals, cosmetics, biofuels, etc.) **2.** To what extent do you agree that the following factors (financial incentives, market demand, etc.) would encourage diversification within the cocoa-based industries.		Identify viable expansion sectors, and identify the untapped export potentials based of the harmonized system code 1801 to 1806	
	Secondary data: Potential diversification beyond confectionery Source: Business insights, ITC export potential map				

The methodological reasoning table (Table 15), maps the questions to its corresponding concept. For example, the upgrading types (process, product, functional and chain) reviewed in Chapter 2 are operationalized through product innovation, branding and marketing strategies, technology use, etc. The challenges outlined in Section 2.6 such as low value addition, financial and policy barriers, are reflected in the questions posed to stakeholders. Similarly, the enabling factors from Bamber at el. (2014) and OECD (2013) such as production capacity (skills), access to finance, etc. were explored during the interviews and surveys.

To quantitatively assess the stakeholders' perceptions regarding upgrading conditions in the cocoa value chain, the structured questionnaires (survey) incorporated a seven-point Likert scale to measure the level of agreement, impact, etc. where respondents rated statement based on the scale (Appendix 3).

Figure 8 illustrates the different data collection questions linked to the overarching research questions. SQ represents the survey questions, and IQ represents the interview question. The red arrow suggests the influence between the research questions.

Figure 8. Mapping survey and interview questions to research questions Source: Author

The empirical analysis identified the key challenges and opportunities in the cocoa value chain by assessing market access conditions, financial constraints, technological capabilities, etc. It is these insights that formed the premise for practical solutions, geared towards enhancing international competitiveness and value capture within the global cocoa industry.

Research Ethics

Ethical considerations in research was prioritized, as researcher obtained approval from all participants, clearly explain the purpose of the research and how their data will be used. Confidentiality of respondents were maintained. In conducting the research, integrity was assured, with accurate and honest reporting of all results. Every participant involved in the study was treated with respect, ensuring that their rights and independence are upheld throughout the research process.

4. Research Results and Discussion on Ivory Coast and Ghana Cocoa Value Chain Upgrading

After the analysis, 252 codes were generated which facilitated the identification of conditions for enhanced international competitiveness within cocoa value chain upgrading. For the survey instrument, a Likert scale was utilized (Appendix 3) to assess the degree of agreement with the questions pertaining to cocoa value chain upgrading. The findings from both analyses are detailed below in this section.

Stakeholder Composition and Country Representation in the Cocoa Sector

The participant profile and distribution provides the basis for understanding the characteristics of the data collected. This is important for interpreting the subsequent analysis of factors influencing cocoa value chain upgrading. The demographic breakdown reveals that cocoa processors/manufacturers constitute the largest group underscoring their central role in cocoa value chain upgrading process.

Table 16. Interview participants

ID	Role	Country
Resp01	Financial institution representative and former cocoa clerk	Ghana
Resp02	Cocoa processor	Ghana
Resp03	Cocoa farmer	Ivory Coast
Resp04	Cocoa processor/manufacturer	Ghana
Resp05	Cocoa processor	Ivory Coast
Resp06	Cocoa farmer	Ghana
Resp07	Cocoa farmer	Ghana
Resp08	Cocoa board official: Marketing	Ghana
Resp09	Cocoa farmer	Ghana

Table 17. Survey cross tabulation data on country of operation and role of respondents Source: Author, survey data

Role * Country of operation Crosstabulation

			Country of operation			
			Cote d'Ivoire	Ghana	Both	Total
Role	Cocoa farmer	Count	3	14	1	18
		% within Role	16.7%	77.8%	5.6%	100.0%
		% within Country of operation	8.3%	16.9%	100.0%	15.0%
	Cocoa Processor/ manufacturer	Count	17	22	0	39
		% within Role	43.6%	56.4%	0.0%	100.0%
		% within Country of operation	47.2%	26.5%	0.0%	32.5%
	Industry expert	Count	3	1	0	4
		% within Role	75.0%	25.0%	0.0%	100.0%
		% within Country of operation	8.3%	1.2%	0.0%	3.3%
	Cocoa Board Official (regulatory role)	Count	10	14	0	24
		% within Role	41.7%	58.3%	0.0%	100.0%
		% within Country of operation	27.8%	16.9%	0.0%	20.0%
	Financial institution representative	Count	1	4	0	5
		% within Role	20.0%	80.0%	0.0%	100.0%
		% within Country of operation	2.8%	4.8%	0.0%	4.2%
	Marketinf professional representative	Count	1	10	0	11
		% within Role	9.1%	90.9%	0.0%	100.0%
		% within Country of operation	2.8%	12.0%	0.0%	9.2%
	Investor/ Entrepreneur	Count	1	18	0	19
		% within Role	5.3%	94.7%	0.0%	100.0%
		% within Country of operation	2.8%	21.7%	0.0%	15.8%
Total		Count	36	83	1	120
		% within Role	30.0%	69.2%	0.8%	100.0%
		% within Country of operation	100.0%	100.0%	100.0%	100.0%

Moreover, the cross-tabulation data from the survey (Table 17) indicates a strong representation from Ghana, illustrating the number and percentage of respondents relative to their country of operation.

The analysis reveals that while the distribution of role varies by country of operation, a more balance distribution is seen for cocoa processors/manufacturers, comprising 22 (56.4%) from Ghana and 17 (43.6%) from Ivory Coast, in comparison to other roles. Given the research focus on upgrading cocoa value chain, the prevalent representation of processors/manufacturers in the sample is justifiable, as they constitute key actors in value addition within the cocoa industry, and their perspectives are crucial for understanding the dynamics of upgrading.

4.1. Challenges Limiting Value Capture in Cocoa Value Chain

This section addresses Research Question 1: What are the challenges limiting value capture in the cocoa value chain for Ivory Coast and Ghana? Challenges within business operation impedes organizational progress. Consequently, identifying and resolving of these impediments are crucial for industries or businesses to achieve sustained growth. The challenges under consideration here include infrastructure and non-infrastructure, financial, human capital and trade certification factors.

General Challenges (Infrastructure and Non-Infrastructure)

Survey question: To what extent do you agree that the following are challenges limiting cocoa value chain upgrading.
Likert scale: Strongly disagree (1) to strongly agree (7)

Figure 9 presents the results of the survey question assessing the extent to which identified challenges limit value capture in the cocoa industry. A strong consensus among respondents indicates their perception and agreement that, the presented list of challenges limits the upgrading of the cocoa value chain. However, among these challenges, inadequate processing infrastructure was perceived as the most significant barrier, followed by limited access to finance, lack of technology, and inadequate human capital.

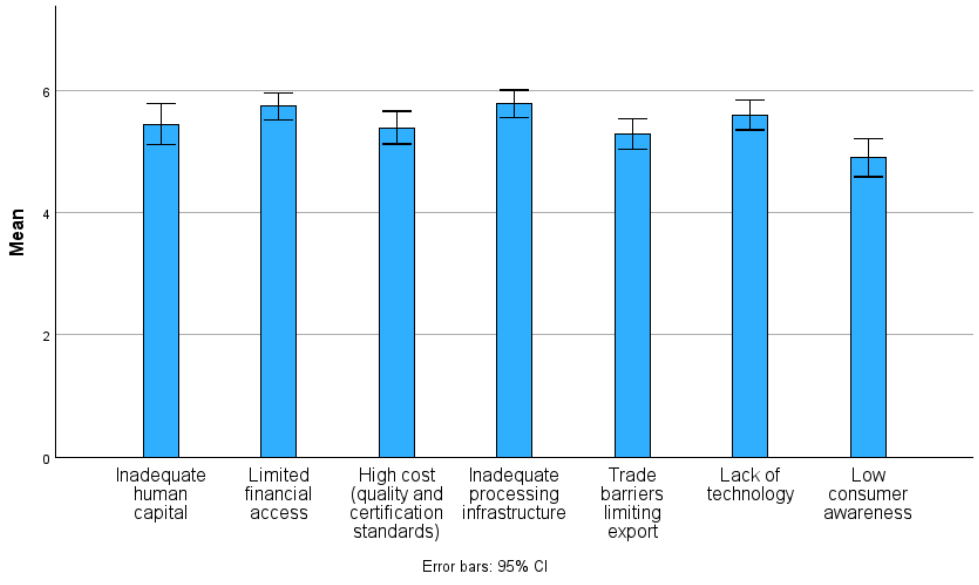

Figure 9. General challenges limiting upgrading cocoa value chain Source: Author, survey data

The qualitative data obtained from the interviews validated the finding that these challenges limit upgrading. Table 18 presents some key themes that emerged from interviewees, showing common challenges to cocoa value chain upgrading.

Table 18. Challenges limiting upgrading cocoa value chain Source: Author, interview data

Theme	Code	Citation	Resp. ID	Relevance in answering Research Question 1
Financial constraints	Lack of capital	"At times, I wish to expand my production, get some inputs and tools to enhance my production but getting money is really difficult for me."	Resp09	Access to finance remains a constraint for small-scale producers and processors, impeding their ability to upgrade production and invest in value addition.
Processing industries and employment	Limited processing companies	"…..there should be enough companies that will be doing processing and chocolate making to employ them after the course"	Resp09	This shows the shortage of local processing capacity and job opportunities in value-added segments of the cocoa value chain.
Human capital development	Need for training	"The sector must establish programs that will teach people … and develop interest in cocoa farming, processing and manufacturing."	Resp06	This emphasizes the need for training programs to develop skilled labor and support upgrading.
Environmental challenges	Climate variability	"Of late the weather has not been favourable, no proper rain and too much of heat which does not help the crop to grow well. This affects our yields."	Resp06	The climate change impacts are reducing yield, which poses a challenge to process upgrading and long-term sustainability in cocoa farming.
Agricultural challenges	Pest and disease	"…includes pest and diseases which reduce my yield. Ones the crop is affected; I have to cut it from the tree so that it doesn't spread."	Resp03	This shows the vulnerability of cocoa production to pests/diseases, which limits yield, affects product quality, and raises input costs (obstacles to process upgrading).

Additional challenges, such as climate changes and pest infestation on cocoa, were recurring concerns for cocoa producers, as these factors affects cocoa production, which constrain opportunities for upgrading through higher yields or improved quality. The convergence across the data collection method suggests that inadequate processing infrastructure, limited access to finance, inadequate human capital are widely experienced impediments to upgrading.

These challenges, identified and validated by respondents, finds broader contextual support in previous assessments. For instance, Table 19 presents the 2019 World Economic Forum's Global Competitiveness Index 4.0 ranking and scores of Ivory Coast and Ghana, alongside the two leading value-generating countries in the global cocoa value chain (Germany and the Netherlands). This comparison (rank/score) underscores the significant impediments these factors pose to upgrading the cocoa value chain or any other industry within these countries. Although these data points are from 2019, they highlight pre-existing challenges in nations. The affirmation of these challenges by respondents indicates that, the challenges persist or limited interventions are implemented by the countries over subsequent years.

Table 19. WEF Global Competitiveness Index 4.0 ranking and score Source: (WEF GCI 4.0, 2019)

Factors	Rank/ score	Ivory Coast	Ghana	Germany	Netherlands
2nd Pillar infrastructure	Rank	116	118	8	2
Utility infrastructure	Rank	117	112	24	3
Quality of road	Score (1-7)	3.59	2.96	5.3	6.43
Financing of SMEs	Score (1-7)	2.46	3.77	5.05	4.83
Skillset of university graduates	Score (1-7)	4.15	4.77	5.25	5.61
Trade openness	Rank	83	89	15	13
R&D expenditure	% of GDP	NA	0.38	2.94	2.03

A higher score in structural factors (Table 19) for a country can positively influence the ability of its industries, while a higher ranking negatively influences the ability to upgrade and capture value within the global value chains. The leading countries in the export of cocoa and cocoa preparations, which host global chocolate manufacturers, consistently capture the highest value in cocoa exports. Comparing these high-performing countries to Ivory Coast and Ghana aims to illustrate the structural gaps in competitiveness that constrain value capture in cocoa-producing countries. The significant disparities in infrastructure, financing, trade openness, and other factors validate the upgrading challenges expressed by respondents.

Infrastructure Challenges

Survey question: Rate the impact of the following infrastructure challenges on cocoa processing.
Likert scale: No impact (1) to extreme impact (7)

Regarding infrastructure (physical facilities) challenges impacting cocoa processing, the lack of training facilities, transportation, and lack of modern equipment were perceived to have the most significant impacts. However, core utilities such as electricity and water supply were not exempt from challenges. During the interviews, the respondents categorized the impact of electricity into unreliable supply and high cost, while transportation challenges were categorized by poor road networks and inadequate transport vehicles. Unreliable electricity supply and poor rood networks were frequently cited. Furthermore, insights from the interviews revealed that, concerning electricity and transportation, the nature of the challenge varies depending on the actor's position within the value chain. Transport challenges were more prevalent at the primary production stage, whereas electricity-related challenges were more pronounced at the secondary processing stage.

Table 20. Infrastructure challenges in cocoa processing Source: Author, interview data

Theme	Code	Citation	Resp. ID	Relevance in answering Research Question 1
Infrastructure challenges	Inconsistent and costly electricity supply	"Without electricity, it will be difficult for processing to survive. Right from the beginning of processing, electricity is required for the machines to work…."	Resp04	It reinforces stable electricity as a prerequisite for cocoa processing and efficient operations. (essential for product upgrading)

		"We most experience power supply inconsistencies, which has made other processing companies to shift to the use of renewable energy for production."	Resp07	Shows adaptation by some processors due to unstable national grid, but also points to cost and reliability issues.
		"Stable and affordable energy supply (electricity) will help the local cocoa processing companies to add more value to raw cocoa beans."	Resp05	Indicates the need for infrastructure investment as a necessary foundation for scaling value addition (product upgrading and competitiveness depend on it).
	Power and Water supply	"The major problem is the power supply and water supply. Electricity here in Ghana is inconsistent and cost of power is very high…"	Resp02	It stresses how utilities directly affect production and pricing, reducing competitiveness in both domestic and export markets.
	Transportation constraints	"Poor road conditions and inadequate transportation networks. This leads to increased transport costs which affects the overall price of the cocoa products."	Resp05	It links road infrastructure to final product pricing. This delays supply chain flow and increase value chain inefficiencies.
		"Road and transport has been the biggest infrastructural challenge to the sector. The cocoa beans are ready and you can't move them to the warehouses…"	Resp01	Poor transport limits timely delivery, which affects quality, hindering Ivory Coast and Ghana's position in the cocoa value chain.

Infrastructure limitations emerged as one of the most frequently cited challenges to upgrading the cocoa value chain, as respondents (Table 20) repeatedly emphasized the impact of electricity instability, high energy costs, and poor transportation networks. These issues were directly associated with production delays, product quality deterioration, and increased operating costs. The responses affirm the critical role of energy and transport as enablers of upgrading and broader value addition, which also aligns with the competitiveness factors highlighted in Section 2.7 by Bamber et al. (2014), thereby reinforcing the importance of infrastructure investment for upgrading potential in cocoa-producing countries.

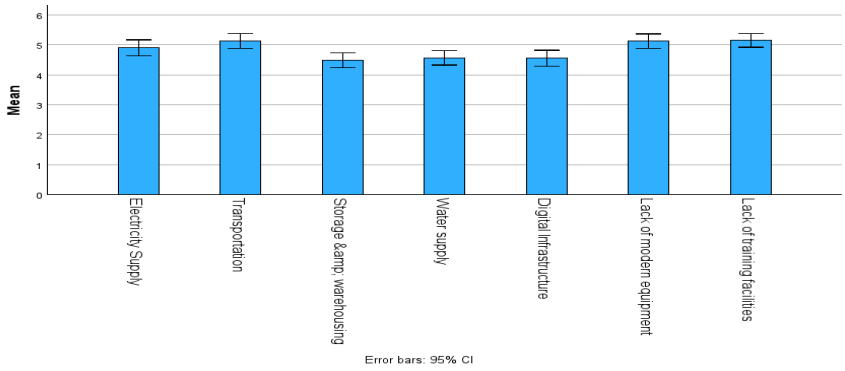

Figure 10. Infrastructure challenges Source: Author, survey data

The statistical analysis (Figure 10) further indicates that infrastructure challenges, particularly those pertaining to transportation, lack of modern equipment, and lack of training facilities, are perceived as exerting a relatively high impact on cocoa processing. While the average (mean) perceived impact of all challenges exceeds the midpoint of the scale (4), they suggest a general agreement that these challenges have at least a moderate impact. The variations in the means and confidence intervals imply that certain challenges are considered more critical than others.

The impact of these challenges on cocoa processing has had a ripple effect on value addition. Respondents perceived lack of modern equipment and inadequate training facilities (with mean scores of 4.80 and 4.73, respectively) as having the most substantial impact on the sector's ability to enhance value addition, followed by electricity and transportation factors. Consequently, for the industry to enhance value addition in cocoa processing, there is a need to prioritize addressing the lack of modern equipment and training facilities, while also considering the establishment of a stable electricity supply and proper road networks.

Human Capital Development

Survey question: To what extent are the following skills lacking in cocoa processing?
Likert scale: Not at all lacking (1) to completely lacking (7)

The analysis focuses on the skill gaps that are prevalent in cocoa processing. While respondents generally perceive a significant skill gaps across various skill areas, the average scores of 3.13 and above (Figure 11) for these areas suggest a general consensus regarding the lack of expertise and the consequent need for improvement. Skills related to innovation in cocoa derivatives and operation of processing machinery, with a mean score of 4.05 and 3.96 respectively, indicate the most lacking skills compared to skills in regulatory compliance; hence, these areas could be prioritized for investment and development.

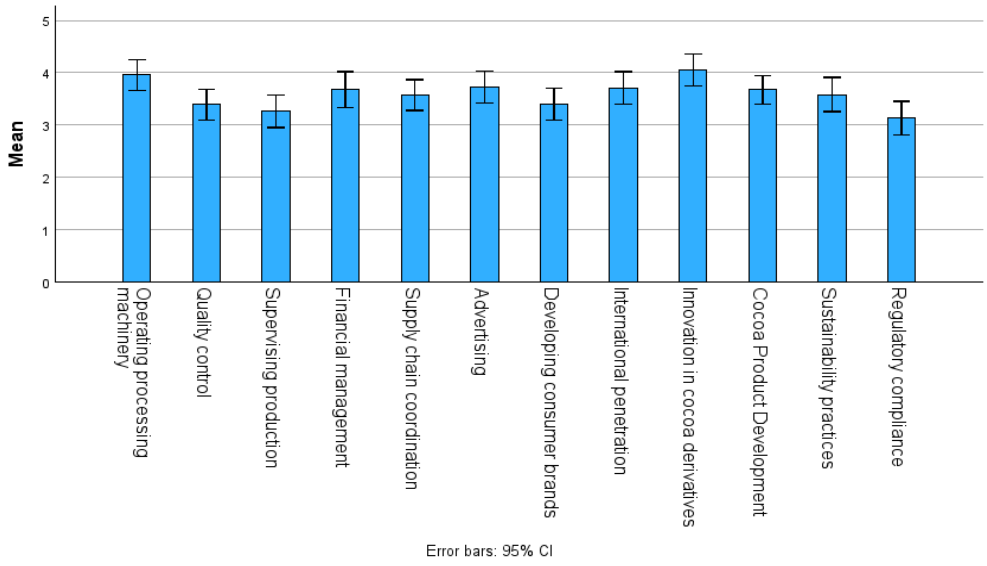

Figure 11. Lacking skills in cocoa processing Source: Author, survey data

Interviewees affirm that formal education would be instrumental in improving these skill gaps across the various skill areas.

Table 21. Workforce development Source: Author, interview data

Theme	Code	Citation	Resp. ID	Relevance in answering Research Question 1
Human capital development	Formal education	"The way to build a vibrant workforce within the cocoa industry in our country is through education"	Resp07	This highlights the importance of formal education in strengthening the workforce for cocoa upgrading.
	Governme nt training programs	"To improve the workforce in the cocoa industry, the government can provide programs from government institutions like Cocoa processing companies, COCOBOD, or CCC that can sensitize its employees, or farmers or those in the value chain to get these skills"	Resp01	Emphasizes the need for government-initiated programs to bridge the skills gap. This is related to institutional maturity and enabling environment (Bamber et al., 2014).
	Vocational education	"…. getting these workforces could be through the vocational schools if their curriculum could incorporate ...."	Resp02	Suggests vocational education as a practical path for building skills tailored to cocoa production.
	University level support	"Universities can also help most especially in research and development. So, I think the mandate lies on the sector to collaborate with the universities for more cocoa product development and others."	Resp02	Suggests the importance of higher education in supporting innovation and industry transformation, tied upgrading pathways.

A recurring theme emerged from the interviews underscored the necessity of developing a capable and skilled workforce as a prerequisite for the sustainable upgrading of the cocoa value chain. As illustrated in Table 21, respondents emphasized various educational pathways, encompassing vocational training, university-level programs, and government initiatives. The majority of coded segments (54.54% each) referred to vocational and university education as foundational for skill enhancement, while 22.73% highlighted government-led training programs, and 18.18% mentioned private sector or organizational initiatives. These insights align with the enabling factors for competitiveness identified in Section 2.8 and reflect the broader conceptual emphasis on human capital as a form of knowledge-based capital by OECD (2013).

Financial Factors (Funding Options and Barriers)

Survey question: Evaluate the extent to which these financial barriers prevent investment in cocoa upgrading.
Likert scale: Not at all (1) to extremely (7)

The interviews identified seven funding options: commercial bank loan, personal savings/investment, government fund, private sector investment, government subsidies/ grant, corporate financing, and development organization fund. Commercial bank loans emerged as the most frequently mentioned option, with 10 segments (41.67%) among the alternatives; however, reliance on such loans is constrained by unfavourable conditions associated therewith. Consequently, a greater reliance on personal savings/investment for funding operations is preferred over other available financing avenues.

Table 22. Financial barriers Source: Author, interview data

Theme	Code	Citation	Resp. ID	Relevance in answering Research Question 1
Financial barriers	High interest rates and collateral requirements	"High interest rate scares these farmers and processors. It's all about the monetary policies of the Central Bank of the country. If the policy rates are high, interest rate on loans will be high …."	Resp01	This explains how macroeconomic policy (central bank policy rates) translates into high borrowing costs which discourages investment in value addition and capacity expansion.
		"Interest rate is too high and the requirement for guarantee is another thing, and most will prefer to use their personal investment than to take a loan that attracts high interest. Currently the rate on borrowing is around 35% per annum or so, and how many will want to go for a loan with such rate. This rate does not make borrowing to expand our operations attractive at all".	Resp02	This explains the deterrent to borrowing due to high interest and collateral demands which reinforces why small processors avoid external capital, hindering upgrading.
		"Although loans are accessible to cocoa producers, the high interest rate on borrowings coupled with collateral requirements does not make it attractive."	Resp07	This reiterates that while funds are available, the terms of access render it ineffective which underscores the need for financing reform in the sector.

As presented in Table 22, the accessibility of loans for cocoa producers and processors is severely limited not only by availability, but by the unattractiveness of the borrowing conditions. Respondents consistently emphasized high annual interest rates (approximately 35%) and collateral requirements (each representing 46.15% of coded segment) as key deterrents to financing. These findings reinforce the essential nature of financial system reform for enabling effective investment in upgrading pathways, and align with structural barriers identified in the literature (Section 2.6; Bamber et al., 2014).

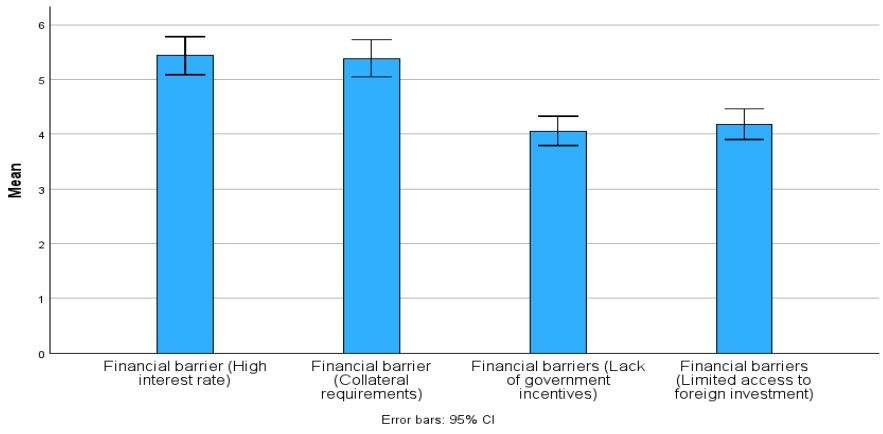

Figure 12. Financial barriers preventing investment in cocoa value chain upgrading. Source: Author, survey data

The statistical analysis also reveals a clear pattern of high interest rate on loans and stringent collateral requirement as significant financial barriers impeding investment in cocoa upgrading. Based on this strong consensus among respondents, it is imperative for Ivory Coast and Ghana to foster investment in cocoa value chain upgrading by addressing the need to lower interest rate on loans for cocoa operations and ease collateral requirements.

Certifications and Regulations (Tariffs) Factors

Survey question: To what extent do you agree that the following certification compliance is costly to the cocoa sector?
Likert scale: Strongly disagree (1) to strongly agree (7)

Trade regulations encompassing both international standards and policies, shape the trajectory of the cocoa value chain. While certain regulations serve as enablers of value chain upgrading, others present challenges. These regulations which addresses Research Question 1 (What are the challenges limiting value capture in the cocoa value chain for Ivory Coast and Ghana?), also bear relevance to Research Question 4 (What role do governance and policies play in shaping the upgrading opportunities). The limitations imposed by regulations on value capture are discussed here, with further exploration to be undertaken under Research Question 4 (Section 4.4.). During the interviews, concerns were raised regarding the costs of certification compliance and external trade dynamics (tariffs), which impact value capture within the cocoa value chain.

Table 23. Regulations affecting value capture Source: Author, interview data

Theme	Code	Citation	Resp. ID	Relevance in answering Research Question 1
Trade and quality regulations	Certification compliance cost	"Certainly yes, regulations affect cocoa value chain upgrading, … standards aim to enhance the cocoa value chain and bolster customer confidence…. but these standards come at a cost …"	Resp01	This acknowledges that the cost of compliance is a constraint. (A governance-related barrier in the global value chain)
	Tariff	"Tariffs also alter the competitiveness for cocoa products in international trade. Recent tariff increases by the US have prompted retaliatory measures."	Resp01	This highlights how external trade policies (tariff) can reduce competitiveness. (A macro-level constraint beyond local firm control, affecting upgrading outcomes.)

This certification compliance is associated with cost (Figure 13), and is perceived as a potential financial burden on stakeholders within the cocoa sector, potentially influencing the adoption rate of these certifications, particularly among small-scale producers or processors. The cost associated with certification compliance and tariffs acts as barriers to international markets, thereby influencing the upgrading pathways of producing countries.

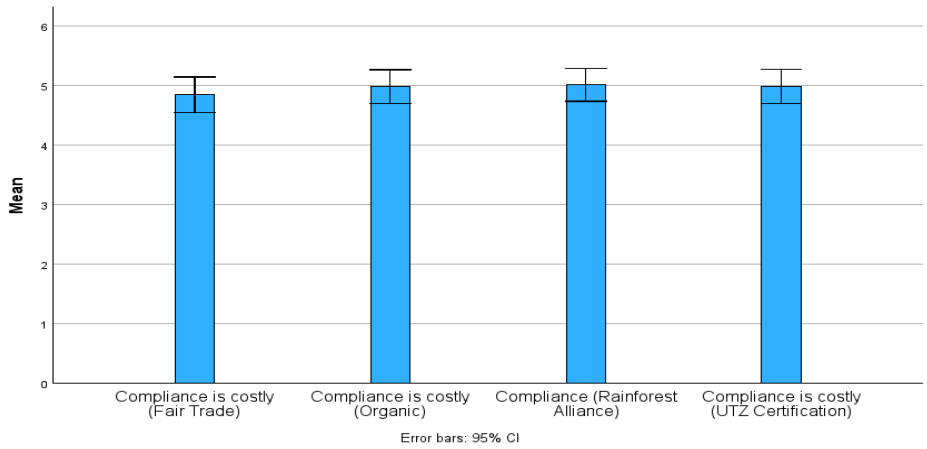

Figure 13. Certification compliance been costly Source: Author, survey data

Nonetheless, given the potential benefits accruing from certification attainment or compliance adherence, the perceived cost should be weighed against these benefits. If these certifications act as barriers, then there may be the need for the industry to implement supportive mechanisms that enable local processors to meet requirement and overcome the associated barriers to international market.

4.2. Factors and Conditions that Influence Enhancement of Competitiveness Through Upgrading

This section addresses Research Question 2: What are the factors or conditions that influence the enhancement of competitiveness through upgrading strategies?

Cocoa Processing Activities that Need Increased Investment

Survey question: To what extent do you agree that each of the following cocoa processing activities needs increased investment.
Likert scale: Strongly disagree (1) to strongly agree (7)

Data collected show a clear consensus among respondents regarding the necessity of increase investment across all stages of the cocoa value chain. However, the later stage (product manufacturing) was identified as requiring the most substantial investment, with a mean value of 6.04.

Secondary data from International Trade Centre (ITC) in 2023 (Figure 3) demonstrably illustrate the significant portion of captured value at the manufacturing stage within the cocoa industry, with countries prioritizing product manufacturing tending to accrue the utmost benefits. This strong affirmation by respondents suggest a potential for enhance value addition or may indicate existing impediments at the product manufacturing stage of the value chain within their respective countries.

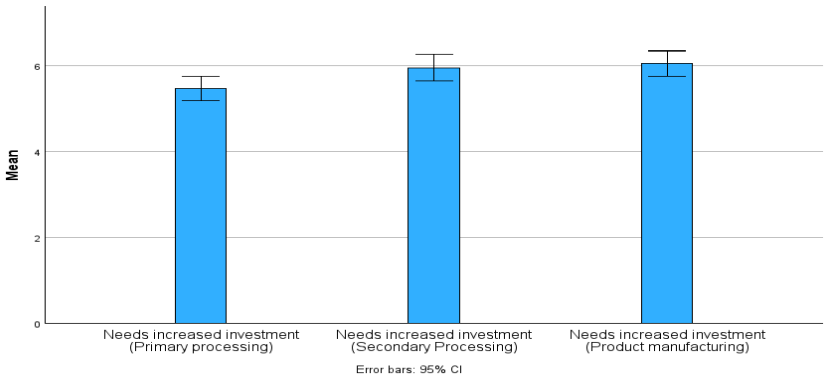

Figure 14. Cocoa production activity that needs increased investment Source: Author, survey data

The analysis (Figure 14) reveals the statistical significance of these differences, as indicated by the overlap of the confidence intervals, suggesting a stronger perceived need for investment in the later stages of the cocoa value chain (secondary processing and product manufacturing) compared to the initial primary processing stage.

Local Cocoa Brands Promotion to International Market (Marketing and Branding)

Survey question: In your opinion, how well-known are local cocoa brands internationally?
Likert scale: Not known at all (1) to highly recognized/established

Interview responses concerning the competitiveness of local cocoa brands revealed that while some domestic brands have attained international recognition, considerable scope of improvement remains.

Table 24. Competitiveness of local brands Source: Author, interview data

Theme	Code	Citation	Resp. ID	Relevance in answering Research Question 2
Competitiveness	Export of finished cocoa product	"Ghanaian finished cocoa product, particularly the Golden Tree Chocolate, have established a significant market presence both within and outside the country, … but then there is room for improvement"	Resp01	This shows product upgrading and marketing to global markets (export of some branded finished products).
	Export of semi-finished products	"to some extent locally processed cocoa products especially the semi-finished products like cocoa butter, and powder are competitive in the global market space".	Resp02	Confirms growing effort in the export of intermediate products (aspects of product and functional upgrading)

These insights underscore a substantial need for intensified branding and marketing initiatives to augment the visibility and awareness of local cocoa brands within the global market. Given Ghana's established reputation for high-quality cocoa beans, a focus on differentiation through the creation of unique cocoa products could distinguish them from other producing nations, while Ivory Coast could prioritize quality enhancement and differentiation strategies. In this context, branding and marketing strategies perceived by respondents (Table 25) as effective in promoting local cocoa products to the global market and enhancing international competitiveness include digital branding and promotional campaigns.

Table 25. Branding and marketing strategies Source: Author, interview data

Theme	Code	Citation	Resp. ID	Relevance in answering Research Question 2
Branding and marketing strategies	Certification and ethical sourcing	"publicizing the use of certifications such as Fairtrade and organic to assure consumers of quality and ethical sourcing could improve international competitiveness."	Resp07	This aligns with sustainability (ethical and quality enhance global competitiveness).
	International exposition participation	"we can increase our participation in international food and trade exhibitions to showcase our products directly to buyers and distributors"	Resp07	This suggests an approach for functional upgrading through marketing.

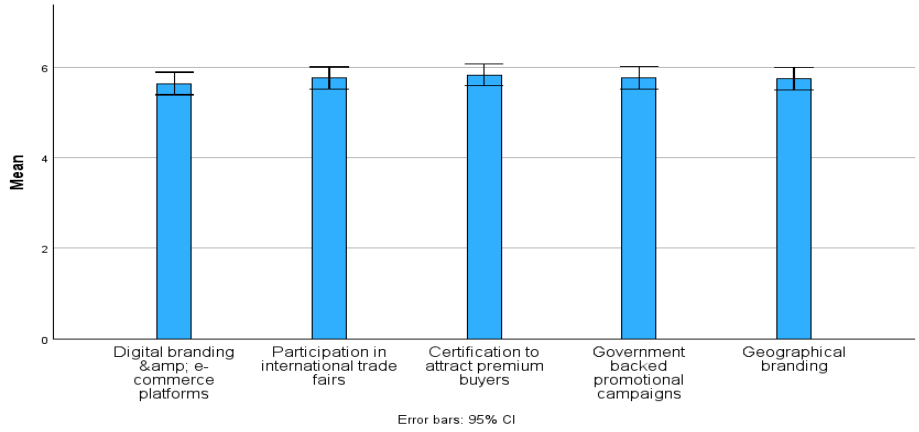

Figure 15. Branding/ marketing strategies to enhance international competitiveness. Source: Author, survey data

Figure 15 presents a list of branding and marketing strategies that respondents affirmed to enhance competitiveness. Among these strategies, adhering to certification standards to attract premium buyers emerged with the highest mean score of 5.83.

Market Potential in Alternative Cocoa-Based Industries

Survey question: How would you rate the market potential of the following alternative cocoa-based industries?
Likert scale: no potential (1) to exceptional potential

The conventional perception of cocoa primarily centers on its use in chocolate manufacturing, however, the market potential associated with cocoa extends beyond this, encompassing a variety of business opportunities that make it appealing for investment and entrepreneurial endeavors. This was affirmed by interviewees, as diverse market opportunities were mentioned, suggesting the significant potential for inter-sector (chain) upgrading. As evidenced in Table 26, these include the use of cocoa husk in the production of cocoa-based tea (commented by Resp02), penetration into the wellness and pharmaceutical sectors (by Resp07), and the repurposing of cocoa waste for agricultural and animal feed purposes (by Resp04). Such diversification not only supports revenue generation and value capture but also aligns with broader aims of agricultural sustainability and circular economy principles. These insights highlight the importance of policy and entrepreneurial support to foster the growth of alternative cocoa-based innovations, which are vital for the industry's long-term resilience

and transformation. Although survey respondents acknowledged the potential in these markets, cocoa-based food products were perceived to hold greater potential (Figure 16).

Table 26. Market potentials in alternative cocoa-based Source: Author, interview data

Theme	Code	Citation	Resp. ID	Relevance
Alternate cocoa-based industries	Product innovation	"The cocoa industry is a high business sector with diversifying opportunities in cocoa related products."	Resp01	This suggests the cocoa value chain has untapped market potential beyond chocolate emphasizing the importance of innovation for product expansion and export diversification.
	Cocoa husk use in beverages	"Mi Cocoa Ltd. uses the husk of cocoa to make cocoa-based tea."	Resp02	This demonstrates product diversification into cocoa-based beverages (value creation through by-product utilization)
	Wellness products and supplements	"The crop also has other business opportunities that can be used in the wellness markets... formulate supplements using cocoa extract, known for its antioxidant properties."	Resp07	This highlights entry into the cocoa-based pharmaceuticals. This supports chain upgrading.
	Agricultural product	"Cocoa shells can be used as fertilizers for farms, or could be used for mulching... expeller cocoa cake could also be used for animal feed."	Resp04	This aligns with the circular economy model by transforming cocoa waste into agricultural inputs.

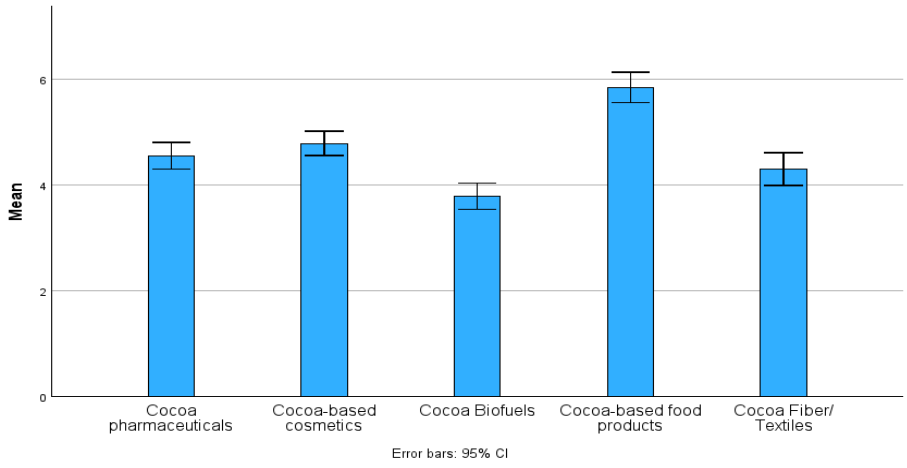

Figure 16. Analysis of market potential for alternative cocoa-based industries Source: Author, survey data

The International Trade Centre Export Potential Map (retrieved in 2025) further provides a clear indication for cocoa and cocoa preparations from Ivory Coast and Ghana to the global market, revealing unrealized potential valued at 3.40 billion USD and 979.05 million USD, respectively (Figure 17 and Table 27). This suggest that both countries possess the capacity to augment their exports. This potential may arise from factors such as unexploited market demand in the international

market, or limitations in infrastructure or expertise required to produce products beyond their current export portfolio.

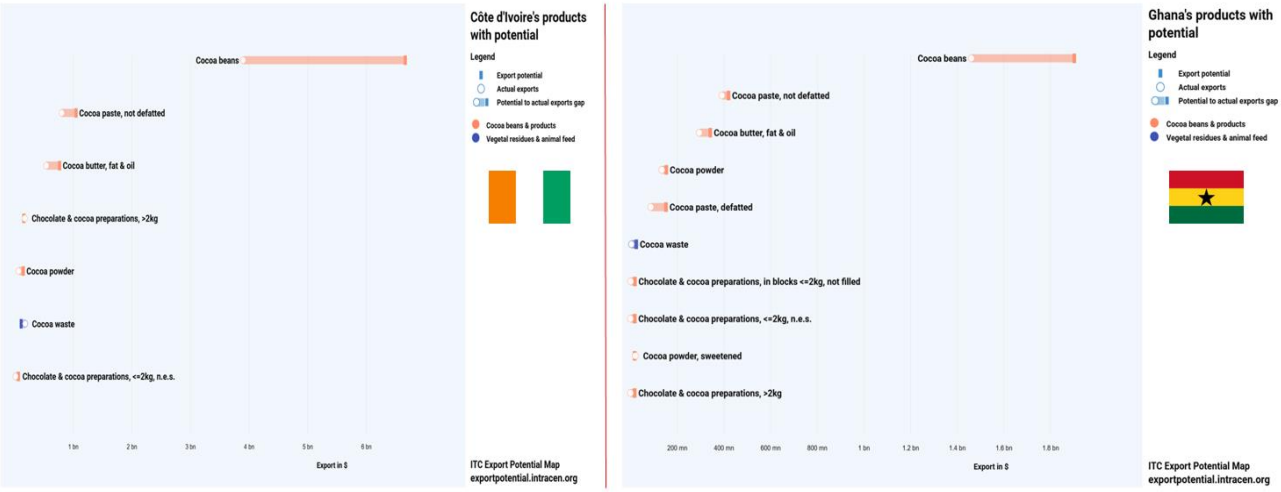

Figure 17. ITC Export Potential Map of Ivory Coast and Ghana for cocoa products
Source: ITC Export Potential Map (2025)

Table 27. Export potential of Ivory Coast and Ghana for cocoa product Source: ITC Export Potential Map (2025)

HS Code	Product	Ivory Coast			Ghana	
		Realized potentials (in USD)	Unrealized potentials (in USD)		Realized potentials (in USD)	Unrealized potentials (in USD)
1801	Cocoa beans	3.9bn	2.7bn		1.5bn	609mn
1802	Cocoa waste	182mn	4.6mn		5mn	3.9mn
1803	Cocoa paste	808mn	257mn		481mn	169mn
1804	Cocoa butter	546mn	314mn		295mn	133mn
1805	Cocoa powder	73mn	58mn		156mn	62.22mn
1806	Chocolate & food preparations containing cocoa	197mn	64.2mn		2.61mn	1.93mn
Total unrealized potential			**3.40bn**			**979.05mn**

In addition to the market potential for alternative cocoa based industries, it is important to consider factors that would incentivize diversification within the cocoa-based industrial sector. Respondents identified and agreed that financial incentives, market demand, research and development initiatives, and policy support would encourage such diversification.

Table 28. Factors encouraging diversification in alternative cocoa-based industries Source: Author, interview data

Theme	Code	Citation	Resp. ID	Relevance in answering Research Question 2
Enablers for diversificati on	Financial incentive	"The cocoa sector presents attractive investment opportunities due to its potential for diversified revenue streams. If out of beans, I am further processing into cocoa	Resp01	This emphasizes the attractiveness of the sector for diversification, as actors are attracted by

		beverages, snacks, cocoa-based cosmetics, pharmaceutical, it's going to augment revenue"		higher revenue potential from processed and derivative products.
	Policy support (fiscal incentives)	"Projects that attract tax breaks or subsidies from the government will increase investment. Such support from the government will expand businesses in other sectors related to cocoa."	Resp02	This shows the role of government policy as a facilitator of diversification. Subsidies and tax breaks reduce entry barriers for new product development.
	Research grants and innovation funding. (R&D)	"Grants for research into sustainable farming practices…. it will stimulate innovation... research in alternative products derived from cocoa like cocoa-based cosmetics and health foods."	Resp07	It stresses the need for public investment in innovation systems. R&D support leads to knowledge creation and product diversification.

4.3. Conditions for Successful Cocoa Value Chain Upgrading

This section addresses Research Question 3: What extent are the theoretically established conditions for successful value chain upgrading present in the cocoa sector?

Accessibility of Training-Related Aspects in Cocoa Processing

Survey question: Rate the accessibility of training in cocoa processing based on the following factors. Likert scale: extremely inaccessible (1) to extremely accessible (7)

Interview data revealed that respondents' concerns extended beyond the mere existence of training programs to encompass the equitable accessibility of these opportunities. Resp06 emphasized the need for training centers to be geographically dispersed across all cocoa growing regions and programs to be either free or at an affordable cost. This suggest a potential issue of unequal distribution of capacity-building resources. It emphasizes the need for the cocoa sector to formulate human capital policies that address both geographic and economic impediments to participation in training-related activities. The statistical evidence (Figure 18) indicates moderate inaccessibility of training centers, coupled with high training costs. While industry support for employee training by private cocoa companies was viewed with moderate accessibility, the neutral mean value (4) presents a divided opinion when compared to other training-related aspects. This perceived inaccessibility of training centers and substantial cost of training exposes the skill gaps and limited advancement observed within the cocoa industry, as discussed in the previous section.

Table 29. Access of training-related aspects in cocoa processing Source: Author, interview data

Theme	Code	Citation	Resp. ID	Relevance in answering Research Question 3
Training-related accessibility	Geographic access and cost of training	"We can have training centers in every cocoa growing region for easy accessibility, and the cost of these training should be free or affordable".	Resp06	This identifies location and cost as barriers to training. Decentralizing training and making it financially inclusive is crucial for widespread adoption of knowledge.

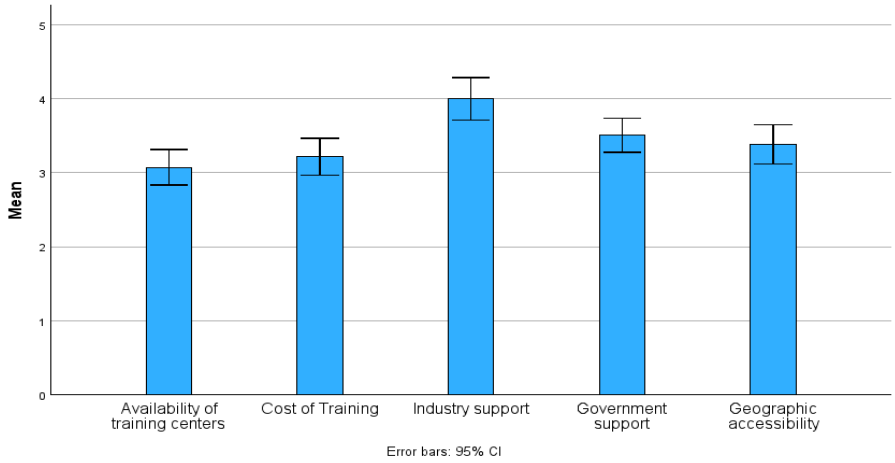

Figure 18. Accessibility of training-related aspects Source: Author, survey data

Policy Interventions

Survey question: Based on the following policy interventions rate how helpful they would be in upgrading the cocoa value chain.
Likert scale: not at all helpful (1) to extremely helpful (7)

Respondents indicated a strong agreement (mean scores 5.94 – 6.30) that the listed government policies (Figure 19) would positively influence the upgrading process if implemented or enforced. While all listed policies were perceived to be beneficial, the analysis reveals that, investment in processing infrastructure and enforcement against deforestation and child labor were deemed the most impactful for upgrading the cocoa value chain.

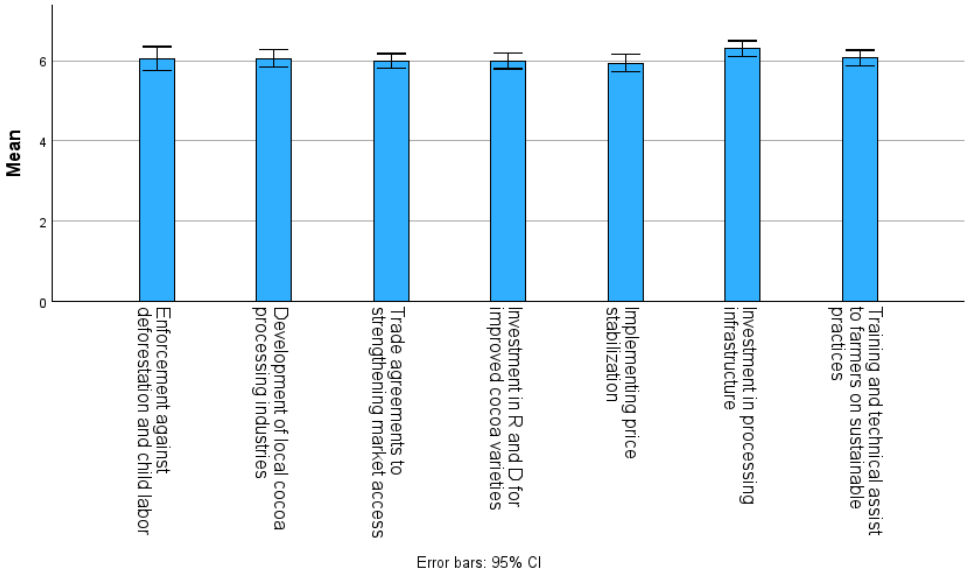

Figure 19. Analysis of policy interventions helpful in upgrading cocoa value chain
Source: Author, survey data

As summarized in Table 30, interviewees emphasized the positive role of policy interventions in facilitating upgrading across various stages of the cocoa value chain. These interventions encompass direct financial incentives such as subsidies and tax relief, price stabilization for cocoa beans, and social governance reforms focused on child labor prevention. These policy tools are consistent with the concepts of upgrading discussed in Chapter 2 and contribute to the establishment of an enabling

environment for sustainable value addition. Effective implementation of such policies supports both economic and social upgrading, thereby incentivizing investment, mitigate vulnerability, and foster adherence to global standards.

Table 30. Policy Interventions Source: Author, interview data

Code	Citation	Resp. ID	Relevance
Fiscal Incentives	"Government policies that serve to provide incentives such as subsidies on fertilizers, scholarship opportunities to children of cocoa farmers and benefits such as tax relief to manufacturers and other entrepreneurs in the value chain will encourage investments in the local cocoa industry."	Resp07	It proves how fiscal incentives can stimulate value addition, improve access to inputs, and promote entrepreneurial participation in the cocoa value chain.
Price stabilization (guaranteed minimum price)	"The price stabilization by the government through COCOBOD ensuring that stable pricing for cocoa farmers... setting a guaranteed minimum price for cocoa beans."	Resp04	This intervention stabilizes farmer incomes, and encourage production, supporting process upgrading.
Social and ethical reforms	"Other reforms also include the child labor prevention measures."	Resp04	This highlights government commitment to upgrading, ensuring that the cocoa industry aligns with global ethical standards and improves value chain reputation.

4.4. Governance Structures and Policies Shaping Upgrading Opportunities

This section addresses Research Question 4: What role do governance structures and policies play in shaping the upgrading opportunities? Previous analyses have revealed several ways through which governance structures and policies influence upgrading opportunities. Specifically, as discussed in Section 4.1 regarding funding options and barriers, high interest rate and stringent collateral requirements impede access to funds for cocoa production and upgrading pathways. Consequently, policies geared towards low interest rate and the easing of collateral demands would shape the upgrading opportunities within the cocoa industry.

Furthermore, as outlined in Section 4.3 concerning policy interventions to facilitate cocoa value chain upgrading, investment in processing infrastructure and enforcement against child labor were considered salient among others measures. Policies that support investment in processing infrastructure would mitigate the reliance on raw cocoa beans exports, as domestic processing augment revenue through higher-value added activities.

Given global concerns regarding deforestation and child labor within the cocoa sector of most cocoa-producing countries in West Africa, which limits international market penetration, policies that enforces afforestation and child labor preventions would shape upgrading opportunities.

In addition, fiscal incentives, research and development that would encourage diversification in alternative cocoa-based industry would shape upgrading opportunities within the cocoa sector of Ivory Coast and Ghana.

Impact of Trade Regulations on Upgrading Cocoa Value Chain

Survey question: Rate the impact of the following trade regulations that influence cocoa value chain upgrading.
Likert scale: no impact (1) to extreme impact (7)

Figure 20 illustrates the perceived level of influence that various trade regulations exert on cocoa value chain upgrading, with respondents indicating a range from moderate to high impact (by mean). This suggests that these trade regulations functions as drivers of change and prerequisites for upgrading. The closeness of the mean values further indicates a similar degree of influence among these trade regulations.

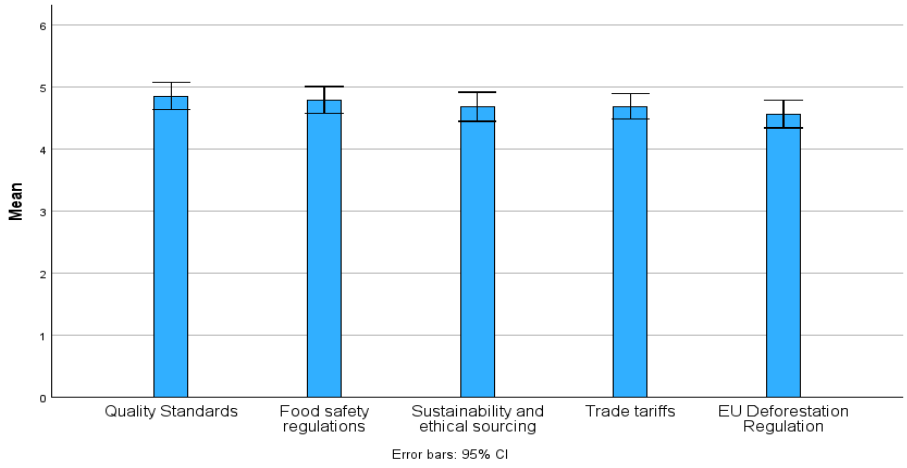

Figure 20. Impact of trade regulations on cocoa value chain upgrading Source: Author, survey data

However, interviews revealed a dual impact of these regulations on the industry, encompassing both positive and negative aspects. While there was a general consensus regarding the necessity of quality and food safety regulations for accessing high-value markets and ensuring consumer protection, concerns were also raised regarding costs associated with certification compliance and tariffs (discussed earlier in Section 4.1). This dual perspective reflects the governance complexities inherent in the global value chain, where cocoa industries in cocoa-producing countries must adhere to evolving standards. These insights reinforce the theoretical position that regulations function as both enablers to upgrading depending on institutional capacity, and supportive systems (Section 2.3)

Table 31. Trade regulations impact on cocoa value chain upgrading Source: Author, interview data

Theme	Code	Citation	Resp. ID	Relevance
Trade and quality regulations	Quality standards and food safety	"Regulations serve to ensure that quality and food safety standards are enforced, so the final consumer gets a wholesome product."	Resp07	This informs the importance of regulations in building consumer confidence, and enhance reputation for exports.
		"Trade regulations such as ISO standards will help ensure that products are of quality."	Resp04	
		"Adhering to quality standards ensure the quality and safety of cocoa products. Food safety regulations also ensure consumers are protected from harmful contaminants."	Resp02	

Analysis of interview coded segments reveals that regulations pertaining to quality and food safety standards (54.55%) and sustainability and ethical standards (36.36%) exert a positively influence on the cocoa value chain upgrading, while trade tariffs tend to negatively impact the industry. This analysis implies that stakeholders engaged in the value chain need to prioritize understanding, complying with, and adapting to these regulations to facilitate upgrading.

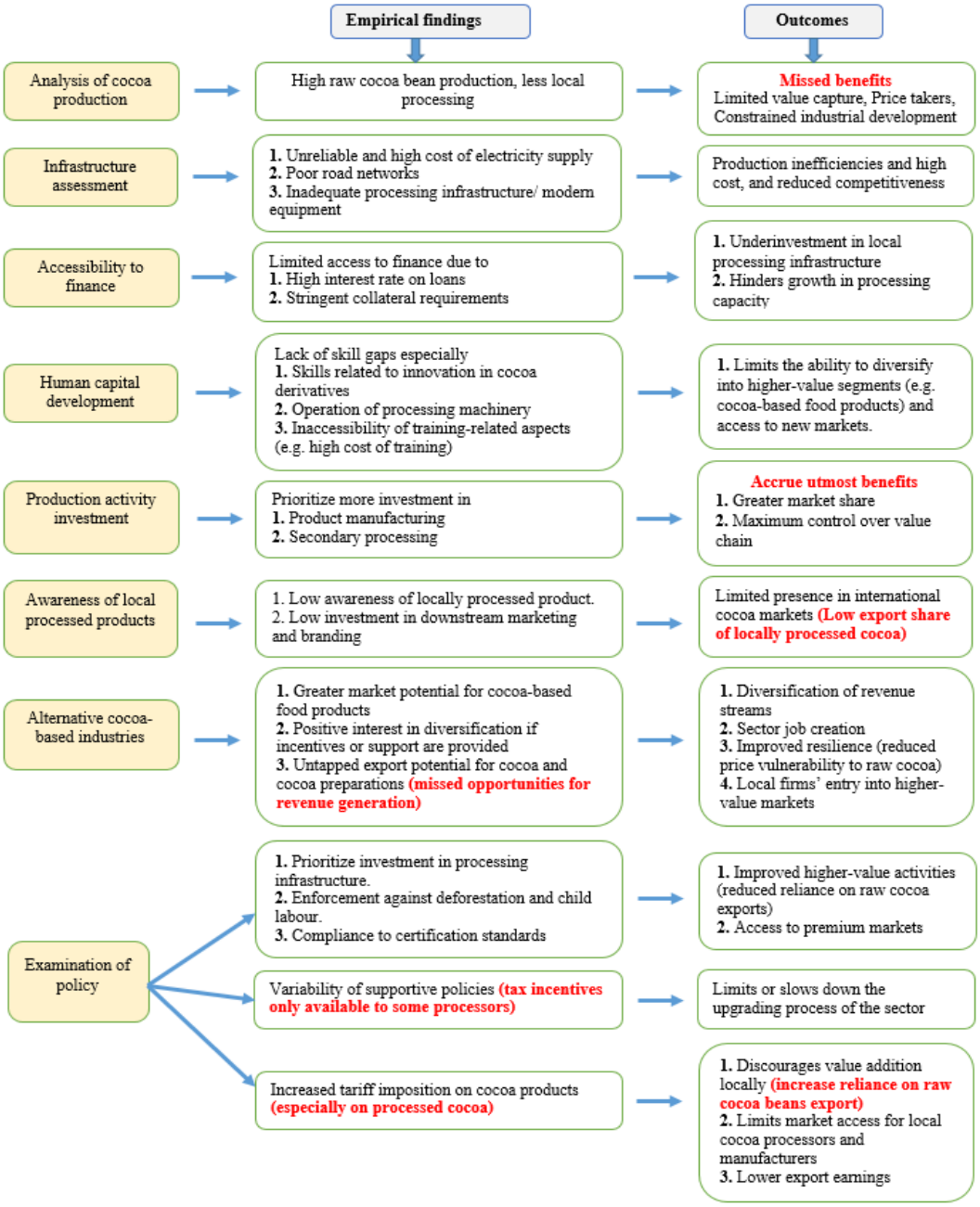

Figure 21. Empirical findings and outcomes for the sector Source: Author

Figure 21 shows the empirical findings and the outcomes for the cocoa sector of Ivory Coast and Ghana. It is these outcomes that informed the suggested recommendations as presented in Figure 22.

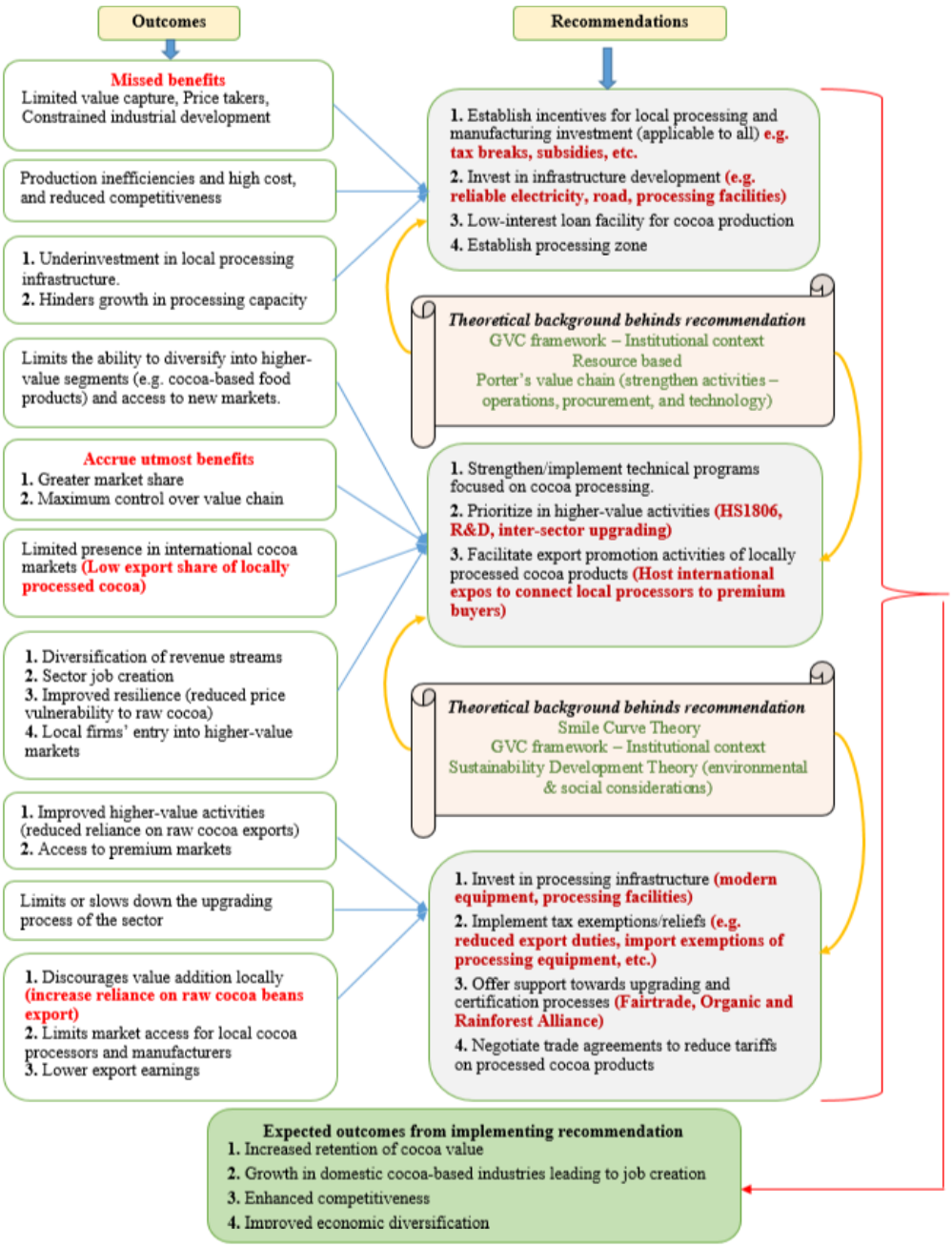

Figure 22. Recommendation based on the outcomes of empirical findings Source: Author

Summary of Discussion

The analyzed data indicates that the value chain upgrading within the cocoa sectors of Ivory Coast and Ghana is constrained by structural, institutional and capability-based limitations. These include their low position in the global value chain, asymmetric power dynamics, inadequate infrastructure and skills gaps, which resonates with themes prevalent in global value chain literature (Gereffi & Fernandez-Stark, 2011; Porter, 1985) and the Smile Curve concept.

A key empirical finding is the presence of significant skill gaps in cocoa processing and marketing, which hinders various types of global value chain upgrading (processing, product, function and chain). Survey data revealed that, majority of stakeholders identified a lack in research and development skills (specifically, innovation in cocoa derivatives), and technical skills (related to the operation of processing machinery), thereby substantiating the theoretical emphasis on human capital

as a prerequisite for value addition (OECD, 2013; Bamber et al., 2014). This aligns with the concept of knowledge-based capital being central to economic upgrading, particularly in facilitating the transition from primary raw cocoa beans production to encompass more processing and manufacturing tasks, as explained by the Smile Curve Theory.

Furthermore, access to finance, an enabler of global value chain upgrading, emerged as a critical constraint across respondents. The prevailing high interest rate (reportedly approximately 35% per annum) and stringent collateral requirements were commonly cited as significant financial barriers, severely limiting investment in both production and upgrading activities. These constraints relate to the institutional context of global value chains, which governs the ability of actors to upgrade through investment and capability development.

The analyzed data further highlighted that while government policies intended to support processing exist, their implementation demonstrates variability. The variability of supportive policies such as tax incentives limits overall impact. For instance, in Ghana while certain cocoa processing and manufacturing firms benefit from tax exemptions, others within the same industry do not receive such advantages. As expressed by Resp02 "This incentive goes to companies operating in the Free Zone Enclave which gives them some financial relieves but those outside the Enclave do not benefit from such incentive by the government." This supports the assertion by Kummritz et al. (2017) that policy effectiveness, rather than mere policy presence, is critical for successful upgrading. Additionally, the dominance of captive governance structure within the cocoa sector of cocoa-producing countries, where local producers are dependent on lead firms, limits their autonomy and restricts negotiation power, further validating the global value chain governance frameworks.

Notably, a discernible trend of increasing interest among stakeholders in diversifying into alternative cocoa-based industries, such as cocoa food products, cosmetics and pharmaceuticals, aligns with the concept of chain upgrading, where actors leverage existing capabilities to enter related sectors. These insights confirm the integration of the Smile Curve Theory, which posits that the highest value is concentrated in upstream (e.g. research and development) and downstream (e.g. branding and marketing) activities currently dominated by firms in Europe and the United States.

In summary, the empirical analysis substantiates the theoretical framework, particularly the importance of skills development, access to finance, governance structures, and institutional support as determinants of upgrading within the global value chain. The study confirms that, the limited value capture experienced by Ivory Coast and Ghana is not primarily attributed to their production capacity, but rather to their relatively slow pace in transitioning into higher value chain segments. Addressing this requires targeted investment in infrastructure, vocational training and partnership with universities, the compliance of certifications, and the implementation of enabling policies that prioritize upgrading pathways, ultimately enhancing the international competitiveness of both countries.

Limitation of Research and Further Research Prospects

While the research has contributed to the identification of conditions for upgrading cocoa value chain, there were limitations. For instance, although the study engaged 129 respondents, the distribution between Ivory Coast and Ghana may not have fully represented the diverse perspectives within the cocoa industry across both countries.

Furthermore, secondary data regarding the rank and score of Ivory Coast and Ghana, in comparison with the two leading exporters of cocoa and cocoa preparations (i.e. Germany and the Netherlands), concerning certain country-wide challenges that impact the cocoa industry, were based on 2019 World Economic Forum ranking, as current data were not ascertained. This constraint rendered it impossible to incorporate changes over time in economic conditions into the analysis.

Additionally, data from surveys and interviews are susceptible to potential biases, as respondents may have either overstate or understate certain responses.

In terms of future research prospects, an in-depth qualitative research could be conducted to explore the experiences and perspectives of the various stakeholder within the cocoa value chain, with the aim to provide deeper insights into the barriers to upgrading.

Lastly, a longitudinal study incorporating changes in the cocoa value chain over time could be undertaken to facilitate a more comprehensive understanding of how interventions and external factors influence cocoa value chain upgrading.

Conclusions and Recommendations

1. The significant reliance of Ivory Coast and Ghana on the export of raw cocoa bean substantially limits their capacity for value capture within the global cocoa value chain and constrains their international competitiveness. This limited engagement in processing and manufacturing renders them vulnerable to price volatility and curtails opportunities for value creation, economic diversification, and technological advancement.
2. A multi-dimensional value chain upgrading strategy was developed, integrating theoretical models such as the global value chain framework, Porter's value chain, the Smile Curve Theory and the Sustainable Development Theory. This integration informed the creation of a conceptual framework outlining four pathways of upgrading: process, product, functional and chain. This framework was supported through identification of conditions that either facilitate or hinder upgrading efforts within the cocoa sector of Ivory Coast and Ghana.
3. To investigate the cocoa value chain upgrading of Ivory Coast and Ghana, a mixed method approach was adopted, which revealed several significant challenges. Challenges such as inadequate processing infrastructure, limited access to finance, gaps in skill sets were identified through interviews and administered surveys. Data analysis was conducted using MAXQDA and Statistical Package for Social Sciences (SPSS), and findings were triangulated.
4. The empirical data analysis provided the following insights into the conditions influencing cocoa value chain upgrading:
   - 4.1 Production and infrastructure challenges remain significant constraints, with respondents from both countries emphasized unstable electricity supply, poor road networks and insufficient processing facilities as major obstacles to expansion into higher-value segments of the cocoa value chain. Investment in processing technology and infrastructure development was identified as vital for enabling upgrading.
   - 4.2 Human capital gaps affect upgrading pathways, as findings indicate that limitations in innovation in cocoa derivatives and technical skills in cocoa processing impedes efforts to capture value in high-value segment. Stakeholders emphasized the need for training programs, and collaborative partnership with research institutions, among other strategies, to develop capabilities in value addition.
   - 4.3 Governance and policy structures exert a significant influence on upgrading opportunities, thereby requiring the implementation of more supportive trade policies, certification compliance and incentivizing structures to encourage investment within the cocoa industry.
   - 4.4 High interest rate and stringent collateral requirement restrict the ability of stakeholders across the cocoa value chain to invest in value-added activities, thus requiring financial reforms that are aimed at easing or mitigating this impediment.
   - 4.5 Upgrading initiatives should not solely emphasize economic gains but must also integrate social and environmental considerations. The adopting and adherence to certifications within the cocoa industry offer access to international market and premium buyers while concurrently addressing critical issues such as child labor and deforestation.

In summary, enhancing international competitiveness through cocoa value chain upgrading entails a coordinated effort which encompasses infrastructure development, human capital development, policy reforms and market-based incentives. By implementing upgrading strategies and addressing the identified impediments, Ivory Coast and Ghana can transition from predominantly raw material exporters to competitive global actors in cocoa processing and manufacturing.

Based on the findings of the research the following recommendations are proposed:

1. Governments should prioritize investment in cocoa processing infrastructure. This can be facilitated through both domestic and foreign investment by establishing dedicated cocoa processing zones equipped with a reliable electricity supply, advanced quality control facilities, and other essential infrastructure. Such initiatives will support cocoa value chain upgrading and enable a greater share of value capture.
   Action: Allocate specific budget lines within the national development plan for the establishment of cocoa processing zones.
   Action: Implement tax exemptions and import duty waivers on processing machinery applicable to all locally registered cocoa processing companies, extending beyond those operating within Free Zone Enclave.
2. Government, in collaboration with the private sector and academic institutions, should implement technical training programs focused on critical areas such as cocoa processing technologies, quality control measures, effective branding strategies and marketing approaches. Strengthening this skills base will enable upgrading and support local firms in meeting the requisite international standards for cocoa-based products.
   Action: Launch a comprehensive national cocoa value addition skills development program with the objective of training a minimum of 500 – 1000 individuals annually. The program should specifically target youth and the existing workforce to address and mitigate identified skill gaps within the cocoa value chain.
3. Since the rate of interest on loans is influenced by the Central bank. Central bank should design and implement low-interest loans and credit guarantee schemes to mitigate the financial barriers that currently hinders investment in value-added activities within the cocoa sector.
   Action: Establish a low-interest loan facility, with interest rates ranging from 5% to 10%, specifically targeted towards small medium-size enterprises (SMEs) investing in equipment for cocoa processing or in the processing of cocoa beans.
   Action: A portion of agricultural development fund should be earmarked specifically for value-added cocoa projects.
4. Cocoa regulatory bodies should provide support towards upgrading, assistance with certification processes, facilitation of export promotion activities, and other relevant measures, to solve existing bottlenecks and actively encourage private sector engagement in processing and innovation.
   Action: Institute annual hosting of export promotion events with the objective of establishing direct connections between local cocoa processors and premium buyers within high cocoa-consuming nations.
5. Cocoa processing firms and entrepreneurs should be encouraged to develop branded cocoa products and strategically enter alternative cocoa-based industries, such as cosmetics and pharmaceuticals. This diversification will enhance the sector's resilience and expand its overall economic footprint.
   Action: Government should establish a co-fund mechanism for pilot ventures focused on the creation of value-added cocoa products across Ivory Coast and Ghana. These pilot initiatives should be provided with startup grants and research and development to foster the development of diversified cocoa products.

List of References

1. Achabou, M. A., Dekhili, S., & Hamdoun, M. (2017). Environmental upgrading of developing country firms in global value chains. *Business Strategy and the Environment*, *26*(2), 224-238. https://doi.org/10.1002/bse.1911
2. Achaw, O. W., & Danso-Boateng, E. (2021). Cocoa processing and chocolate manufacture. Chemical and process industries. *Springer*, Cham. https://doi.org/10.1007/978-3-030-79139-1_10
3. Aggarwal, S. (2017). Smile curve and its linkages with global value chains. *Journal of Economics Bibliography*, *4*(3), 278–286. https://doi.org/10.1453/jeb.v4i3.1434
4. Armando, E., Azevedo, A., Fischmann, A., & Pereira, C. (2016). Business strategy and upgrading in global value chains: a multiple case study in information technology firms of Brazilian origin. *RAI Revista de Administração e Inovação*, *13*(1), 39-47. https://doi.org/10.1016/j.rai.2016.01.002
5. Bamber, P., Fernandez-Stark, K., Gereffi, G., & Guinn, A. (2014), Connecting local producers in developing countries to regional and global value chains: update, OECD Trade Policy Papers, No. 160, OECD publishing, Paris. http://dx.doi.org/10.1787/5jzb95f1885l-en
6. Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*,*17*(1), 99-120.
7. Barrientos, S. (2014). Gendered global production networks: Analysis of cocoa–chocolate sourcing. *Regional Studies*, *48*(5), 791–803. https://doi.org/10.1080/00343404.2013.878799
8. Barrientos, S., & Asenso-Okyere, K. (2009). Cocoa value chain: Challenges facing Ghana in a changing global confectionary market. *Journal fur Entwicklungspolitik*, *25*(2), 88-107. DOI:10.20446/JEP-2414-3197-25-2-88
9. Can, L. (n.d.). Upgrading Vietnam's participation in the global value chains. *Southeast Asian Affairs* 2022, 392–410. https://www.jstor.org/stable/10.2307/27206758
10. Cattaneo, O., Gereffi, G., Miroudot, S., & Taglioni, D. (2013). Joining, upgrading and being competitive in global value chains: a strategic framework (English). Policy Research working paper; no. WPS 6406 Washington, D.C.: World Bank Group. http://documents.worldbank.org/curated/en/254001468336685890/
11. Cocoa and Forests initiative. (2022). Cocoa and Forests Initiative Annual Report: Cote d'Ivoire 2022. Retrieved from https://www.idhsustainabletrade.com/uploaded/2017/03/Rapport-2022-Initiative-Cacao-et-Forets-Cote-dIvoire_English.pdf
12. De Marchi, V., Di Maria, E., Golini, R., & Perri, A. (2020). Nurturing international business research through global value chains literature: a review and discussion of future research opportunities. *International Business Review*, *29*(5), 101708. https://doi.org/10.1016/j.ibusrev.2020.101708
13. Dollar, D., & Kidder, M. (2017). Institutional quality and participation in global value chains. Measuring and analysing the impact of GVCs on economic development, 161-173.
14. Feenstra, R., Ma, H., & Xu, Y. (2019). US exports and employment. *Journal of International Economics*, *120*, 46-58. https://doi.org/10.1016/j.jinteco.2019.05.002.
15. Floris, L., Calegario, C., Brito, M. & Caetano, R. (2022). Upgrading in global value chains: An integrative literature review. *Revista de Administração e Contabilidade da Unisinos*. 19. 694-728. https://doi.10.4013/base.2022.191.01.
16. Fountain, A. C., & Huetz-Adams, F. (2022). Cocoa barometer 2022 Report. Retrieved from https://cocoabarometer.org/wp-content/uploads/2022/12/Cocoa-Barometer-2022.pdf)

17. Gayi, S. K., & Tsowou, K. (2016). Cocoa industry: Integrating small farmers into the global value chain cocoa DOI:10.18356/cfb75b0e-en
18. GCB Strategy and Research Department (2022). Sector industry analysis, cocoa sector report. Retrieved from https://www.gcbbank.com.gh/research-reports/sector-industry-reports/120-cocoa-industry-in-ghana-2022/file
19. Gentile, E., Xing, Y., Rubínová, S., & Huang, S. (2021). Productivity growth, innovation, and upgrading along global value chains. *Global value chain development report 2021*. 72-104. World Trade Organization.
20. Gereffi G., & Fernandez-Stark K. (2011). Global value chain analysis: A primer. Cambridge University Press. DOI 10.1017/9781108559423.012
21. Gereffi, G., & Frederick, S. (2009). Value chain governance: *Briefing paper*. U.S. Agency for International Development.
22. Grumiller, J., & Grohs, H. (2022). Sustainability in the cocoa-chocolate global value chain: From voluntary initiatives to binding rules? *Österreichische Forschungsstiftung für Internationale Entwicklung*. https://hdl.handle.net/10419/251779
23. GyanKosh. (n.d.). Introduction to agricultural value chain. https://egyankosh.ac.in/bitstream/123456789/105329/1/
24. Gygli, S., Haelg, F., Potrafke, N., & Sturm, J. (2018): The KOF globalization index – revisited. CESifo Working Paper, No. 7430, Center for Economic Studies and ifo Institute (CESifo), Munich.
25. Henn, C., Papageorgiou, C., Romero, J. M. et al. (2020). Export quality in advanced and developing economies: Evidence from a new data set. *IMF Economic Review*, 68, 421–451. https://doi.org/10.1057/s41308-020-00110-8
26. Humphrey, J., & Schmitz, H. (2002). How does insertion in global value chains affect upgrading in industrial clusters? *Regional Studies*, *36*(9), 1017–1027. https://doi.org/10.1080/0034340022000022198
27. International Trade Centre (2001). Cocoa: A guide to trade practices. *International Trade Centre UNCTAD/WTO*. Retrieved https://www.intracen.org/file/cocoaaguidetotradepracticesenglishpdf
28. Islam, M. T., & Polonsky, M. J. (2020). Validating scales for economic upgrading in global value chains and assessing the impact of upgrading on supplier firm's performance. *Journal of Business Research*, *110*(2020), 144-159. https://doi.org/10.1016/j.jbusres.2020.01.010
29. Jindra, B., Hatani, F., Steger, T., & Hiemer, J. (2019). Social upgrading and cooperative corporate social responsibility in global value chains: The case of Fairphone in China. Global Networks: *A Journal of Transnational Affairs*, *19*(3), 371-393. https://doi.org/10.1111/glob.12232
30. Khattak, A. & Pinto, L. (2018). A systematic literature review of the environmental upgrading in global value chains and future research agenda. *Journal of Distribution Science*, *16*. 11-19. 10.15722/jds.16.11.201811.11.
31. Koenig, P. & Antras, P. (2023). The importance of global value chains in international trade and their consequences for trade policy. *Policy Brief*, Paris School of Economics.
32. Kroeger, A., Bakhtary, H., Haupt, F., & Streck, C. (2017). Eliminating deforestation from the cocoa supply chain. DOI:10.13140/RG.2.2.20160.07686
33. Kummritz, V., Taglioni, D., & Winkler, D. (2017). Economic upgrading through global value chain participation: which policies increase the value added gains. *Policy Research working paper*, no. WPS 8007, Washington, D.C., World Bank Group. http://documents.worldbank.org/curated/en/567861489688859864/

34. Kuroiwa, I. (2016). 'Thailand-plus-one': a GVC-led development strategy for Cambodia. *Asian-Pacific Economic Literature*, *30*, 30-41. https://doi.org/10.1111/apel.12134
35. Lee, J., & Karpova, E. (2018). Revisiting competitiveness theory in the new global environment: Review and analysis of the competitiveness definition. *International Journal of Competitiveness*, *1*(3), 189-205. https://doi.org/10.1504/IJC.2018.091474
36. Marcato, M. B., & Baltar, C. T. (2017). Economic and social upgrading in global value chains: concepts and metrics. Texto para Discussão. Unicamp. IE, Campinas, 318. https://doi.org/10.20396/rbi.v19i0.8654359
37. Martins, F. P., Batalhão, A. C. S., Ahokas, M., Liboni Amui, L. B. & Cezarino, L. O. (2023). Rethinking sustainability in cocoa supply chain in light of SDG disclosure. *Sustainability Accounting, Management and Policy Journal*, *14*(7), 258-286. https://doi.org/10.1108/SAMPJ-03-2022-0132
38. Mathe, S., Hansel, G., Sonfack, M., Ludovic, T., Abega, J., & Sadeu, M. (2022). New challenges for innovation support services to improve cocoa quality and sustainability in Cameroon. *Science, Technology, Development*, *3* (1), 17 https://doi.org/10.21494/ISTE.OP.2023.0917
39. Mehta, S. (2022) Upgrading within global value chains: backward linkages, forward linkages and technological capabilities. *Asian Journal of Technology Innovation*, *30*(3), 581-600. DOI: 10.1080/19761597.2021.1938152
40. Meng, B., Ming, Y., & Shang-Jin, W. (2020). Measuring smile curves in global value chains. *Oxford Bulletin of Economics and Statistics*, *82*(5), 988-1016. DOI: 10.1111/obes.12364
41. Mensah, J. (2019). Sustainable development: Meaning, history, principles, pillars, and implications for human action: Literature review. *Cogent Social Sciences*, *5*(1). https://doi.org/10.1080/23311886.2019.1683296
42. Minh, C. M. (2024). Vietnam's participation in the global value chain of the electronics industry in the context of digital transformation. *International Journal of Advanced Research and Publications*. *7*(4), 48-60.
43. Navarrete, S. D. S., Borini, F. M., & Avrichir, I. (2020). Environmental upgrading and the United Nations Sustainable Development Goals. *Journal of Cleaner Production*, 264, 121563. https://doi.org/10
44. Naydenov, K., Delera, M., Boisseau, A. & Gaddari, D. (2022). Cocoa Processing Study: Final Report. Ecorys.
45. Neilson, J., Pritchard, B., Fold, N., & Dwiartama, A. (2018). Lead firms in the cocoa–chocolate global production network: An assessment of the deductive capabilities of GPN 2.0. *Economic Geography*. *94*(1), 1-25. 10.1080/00130095.2018.1426989.
46. OECD (2013). Interconnected economies: Benefiting from global value chains, OECD Publishing, Paris. https://doi.org/10.1787/9789264189560-en
47. Parra-Lancourt, M. (2021). Upgrading in primary commodity value chains: the case of cocoa and coffee. https://vc.easychair.org/publications/preprint/2M9r
48. Parra-Paitan, C., Meyfroidt, P., Verburg, P. H., & Zu Ermgassen, E. K. H. J. (2024). Deforestation and climate risk hotspots in the global cocoa value chain. *Environmental Science and Policy*, *158*, 1-9. https://doi.org/10.1016/j.envsci.2024.103796
49. Pipkin, S., & Fuentes, A. (2017). Spurred to upgrade: a review of triggers and consequences of industrial upgrading in the global value chain literature. *World Development*, *98*, 536-554. https://doi.org/10.1016/j.worlddev.2017.05.009

50. Ponte, S. (2002). The 'latte revolution'? Regulation, markets and consumption in the global coffee chain. *World Development*, *30*(7), 1099–1122. https://doi.org/10.1016/S0305-750X(02)00032-3
51. Ponte, S., & Ewert, J. (2009). Which way is "up" in upgrading? Trajectories of change in the value chain for South African wine. *World Development*, *37*(10), 1637-1650. https://doi.org/10.1016/j.worlddev.2009.03.008
52. Porter, M. E. (1985). The competitive advantage: creating and sustaining superior performance. New York: Free Press.
53. Pushp, P. & Ahmed, F. (2023). The global value chain: Challenges faced by ASEAN least developed countries. *Journal of Policy Modeling*, *45*(6), 1223-1245. https://doi.org/10.1016/j.jpolmod.2023.06.001
54. SER (2018). Cocoa Value Chain Analysis. Report. Retrieved from https://www.imvoconvenanten.nl/-/media/imvo/files/banking/news/IMVO-Cocoa-value-chain-analysis-EN.pdf
55. Stojčić, N. & Matić, M. (2024). A journey toward global value chain upgrading: Exploring the transition from backward to forward integration. *Technology in Society*, *76*, 102435, https://doi.org/10.1016/j.techsoc.2023.102435.
56. Syafrian, D. (2019). Upgrading challenges in global value chains. *Advances in Economics, Business and Management Research*, *98*, 168-172. https://doi.org/10.1991/icot-19.2019.36
57. Talbot, J. M. (2002). Tropical commodity chains, forward integration strategies and international inequality: coffee, cocoa and tea. *Review of International Political Economy*, *9*(4), 701–734. https://doi.org/10.1080/0969229022000021862
58. Tang M., Kong, L., Chandran, V., & Baskaran, A. (2023). Upgrading and reconstruction of global value chain: Case of Chinese firm's catching up trajectory. *Institutions and Economies*, *15*(4), 63-86. https://doi.org/10.22452/IJIE.vol15no4.3
59. Tian, K., Dietzenbacher, E., & Jong-A-Pin, R. (2022). Global value chain participation and its impact on industrial upgrading. *World Economy*, *45*(5), 1362-1385. https://doi.org/10.1111/twec.13209
60. UNICEF (2018). Children's rights in the cocoa-farming communities of Ivory Coast. Synthesis Report. https://www.unicef.org/childrightsandbusiness/media/331/file/Children-Rights-Cocoa-Communities-Synthesis-Report.pdf
61. Vinci, G., Ruggeri, M., Gobbi, L., & Savastano, M. (2024). Social life cycle assessment of cocoa production: Evidence from Ivory Coast and Ghana. *Resources*, *13*(10), 141. https://doi.org/10.3390/resources13100141
62. Wen, Y & Wen, S. (2023). The relationship between dynamic capabilities and global value chain upgrading: the mediating role of innovation capability. *Journal of Strategy and Management*, *17*(1), pp. 123-139. DOI 10.1108/JSMA-05-2023-0096

List of Information Sources

1. Cocobod. (n.d.). Subsidiaries and divisions. Retrieved from https://cocobod.gh/subsidiaries-and-divisions.
2. French market potential for cocoa | CBI. (2024). https://www.cbi.eu/market-information/cocoa-cocoa-products/france/market-potential
3. GCI 4.0: Global Competitiveness Index 4.0 | Indicator Profile | Prosperity Data360. (n.d.). https://prosperitydata360.worldbank.org/en/indicator/WEF+GCI+GCI4
4. https://www.ibisworld.com/canada/industry/chocolate-production/230/
5. https://www.iisd.org/ssi/commodities/cocoa-coverage/#:~:text=Up%20to%206%20million%20farmers,lands%20less%20than%205%20hectares.
6. ITC Export Potential Map. (n.d.). https://exportpotential.intracen.org/en/
7. OECD. Global value and supply chains. https://www.oecd.org/en/topics/policy-issues/global-value-and-supply-chains.html.
8. Statista (2024) "Leading Exporters of Chocolate and Chocolate Containing Products Worldwide in 2020, by Country." https://www.statista.com/statistics/1117721/top-chocolate-exporters-by-country/
9. The BMEL's Commitment for Sustainable Cocoa. (2024). https://www.bmel.de/EN/topics/food-and-nutrition/sustainable-consumption/commitment-sustainable-cocoa.html
10. Tridge. (2021). 2021 Industry report: cocoa beans. https://cdn.tridge.com/market_report_report/24/8e/b5/248eb54e641bb3bd67b2e7d4a976929c31509d62/Industry_Report_-_Cocoa_beans.pdf
11. World Economic Forum (WEF, 2024) https://www.weforum.org/stories/2020/11/cocoa-chocolate-supply-chain-business-bar-africa-exports/

Appendices

Appendix 1. Interview Questions for Respondents

1. In your opinion, what specific skills are needed in cocoa processing?
2. Do you think vocational training, university partnerships, private sector investment in employee training, and government funded technical programs can improve workforce skills in the cocoa industry, and which will be most effective?
3. In your experience, which infrastructure factor (electricity supply, road and transportation access, storage and warehousing facility, water supply, and digital infrastructure) mostly affect cocoa upgrading?
4. What improvement in these factors will positively impact cocoa processing the most?
5. Could you tell me; what financing options are available for cocoa production? And in your opinion what financial barriers (high interest rate, collateral requirement, lack of government incentives, etc. most limits access to finance in the sector?
6. In what ways do trade regulations (Quality standards, Food safety regulations, sustainability and ethical sourcing, trade tariffs) affect cocoa value chain upgrading.
7. Do you believe government policies support or hinders the growth of cocoa processing businesses, and in what ways?
8. Do you think locally processed cocoa products have been competitive in global market? What is your experience in selling or marketing cocoa products abroad? Share some good and bad cases.
9. What was your experience in selling or marketing in particular foreign country(ies)?
10. Based on your experience, what branding or marketing strategies could improve international competitiveness?
11. What potential business opportunities do you see for diversifying cocoa products? (What new things can we make with cocoa besides the usual chocolate bars/ what new businesses that could use cocoa in a different way?)
12. In your opinion, are investors/entrepreneurs drawn or attracted to other sectors related to cocoa?
13. What policy incentives do you believe could promote investment in other sectors related to cocoa?

Appendix 2. Survey Questions to Respondents

1. Indicate the country of your operation.

Country	**Please tick appropriate**
Ivory Coast	
Ghana	

2. Which of the following best describes your role in the cocoa industry?

Role	**Please tick appropriate**
Cocoa farmers	
Cocoa processors and manufacturers	
Industry experts	
Cocoa Board Officials	
Financial institutions	
Marketing professionals	
Investors/ Entrepreneurs	

3. To what extent do you agree that the following are challenges limiting cocoa value chain upgrading?

General challenges	Strongly disagree **(1)**	Disagree **(2)**	Somewhat disagree **(3)**	Neutral **(4)**	Somewhat agree **(5)**	Agree **(6)**	Strongly Agree **(7)**
Inadequate human capital (skilled workforce)							
Limited financial access for cocoa processing							
High cost of meeting international quality and certification standards							
Inadequate processing infrastructure (e.g. lack of local grinding facilities)							
Trade barriers limiting export of processes cocoa products							
Lack of technology for cocoa processing							
Low consumer awareness of locally processed cocoa products.							

4. To what extent are the following skills lacking in cocoa processing?

Skill category		Completely lacking **(7)**	Very large lacking **(6)**	Largely lacking **(5)**	Moderately lacking **(4)**	Somewhat lacking **(3)**	Slightly lacking **(2)**	Not at all lacking **(1)**
Technical skills	Operating cocoa processing machinery							
	Quality control,							

Managerial skills	Supervising production							
	Financial management							
	Supply chain coordination							
Marketing and Branding	Advertising							
	Developing consumer brands							
	International penetration							
R&D	Innovation in cocoa derivatives							
	Cocoa Product Development							
	Sustainability practices							
Regulatory compliance (Understanding international food safety and certification standards)								

5. Rate the accessibility of training in cocoa processing based on the following factors.

Training Accessibility Factor	Extremely inaccessible **(1)**	Very inaccessible **(2)**	Moderately inaccessible **(3)**	Neutral **(4)**	Moderately accessible **(5)**	Very accessible **(6)**	Extremely accessible **(7)**
Availability of training centers (Are there enough training institutions for cocoa processing?)							
Cost of Training (Is training affordable for cocoa workers and processors?)							
Industry support (Do private cocoa companies invest in employee training?)							
Government support (Are there government sponsored training programs available?)							
Geographic accessibility (Is training available in cocoa producing regions?)							

6. Rate the impact of the following infrastructure challenges on cocoa processing.

Infrastructure challenge	No impact **(1)**	Very low impact **(2)**	Low impact **(3)**	Moderate impact **(4)**	High impact **(5)**	Very high impact **(6)**	Extreme impact **(7)**
Electricity Supply (Unstable power affecting production)							
Transportation (Poor roads causing delays and high costs)							
Storage & warehousing (Limited facilities affecting cocoa quality?)							
Water supply (Limited water access used for processing needs)							
Digital Infrastructure (ICT in trade and automation?)							
Lack of modern processing equipment							
Lack of training facilities for skilled labor							

7. Evaluate the infrastructure issues that impact value addition the most?

Infrastructure challenge	No impact **(1)**	Very low impact **(2)**	Low impact **(3)**	Moderate impact **(4)**	High impact **(5)**	Very high impact **(6)**	Extreme impact **(7)**
Electricity Supply (Unstable power affecting production)							
Transportation (Poor roads causing delays and high costs)							
Storage & warehousing (Limited facilities affecting cocoa quality?)							
Water supply (Limited water access used for processing needs)							
Digital Infrastructure (ICT in trade and automation?)							
Lack of modern processing equipment							
Lack of training facilities for skilled labor							

8. To what extent do cocoa processors depend on the various types of funding available to them.

Financing Options	Not at all **(1)**	Very little **(2)**	Little **(3)**	Moderately **(4)**	Much **(5)**	Very much **(6)**	Extremely **(7)**
Personal Savings/ Investment							
Government backed financing (Cocoa Board Loans)							
Subsidies and Grant							
Commercial bank loans							
Development organization Funding (e.g. World Bank, African Development Bank)							
Cooperative financing							

9. Evaluate the extent to which these financial barriers (high interest rate, collateral requirement, lack of government incentives, etc.) prevent investment in cocoa upgrading.

Financial Barrier	Not at all **(1)**	Very slightly **(2)**	Slightly **(3)**	Moderately **(4)**	Conside rably **(5)**	Very consider ably **(6)**	Extremely **(7)**
High interest rate (Cost of access credit is too high)							
Collateral requirements (Strict loan conditions)							
Lack of government incentives (No subsidies for processors)							
Limited access to foreign investment (Few partnerships)							

10. To what extent do you agree that the following financing options are accessible for cocoa production.

Financing options	Strongly disagree **(1)**	Disagree **(2)**	Somewhat disagree **(3)**	Neutral **(4)**	Somewhat agree **(5)**	Agree **(6)**	Strongly Agree **(7)**
Personal Savings/ Investment							
Government backed financing (Cocoa Board Loans)							
Subsidies and Grant							
Commercial bank loans							
Development organization Funding (e.g. World Bank, African Development Bank)							
Cooperative financing							

11. To what extent do you agree that each of the following cocoa processing activities needs increased investment.

Processing activities	Strongly disagree **(1)**	Disagree **(2)**	Somewhat disagree **(3)**	Neutral **(4)**	Somewhat agree **(5)**	Agree **(6)**	Strongly Agree **(7)**
Primary processing (Fermentation and Drying)							
Secondary Processing (Cocoa mass, butter, and powder)							
Product manufacturing (Chocolate and other cocoa-based products)							

12. Rate the impact of the following trade regulations that influence cocoa value chain upgrading.

Trade Regulations	No impact **(1)**	Very low impact **(2)**	Low impact **(3)**	Moderate impact **(4)**	High impact **(5)**	Very high impact **(6)**	Extreme impact **(7)**
Quality Standards							
Food safety regulations							
Sustainability and ethical sourcing							
Trade tariffs							
EU Deforestation Regulation							

13. Do you believe certifications will improve the competitiveness of locally processed cocoa products in global market?

	Strongly disagree **(1)**	Disagree **(2)**	Somewhat disagree **(3)**	Neutral **(4)**	Somewhat agree **(5)**	Agree **(6)**	Strongly Agree **(7)**
Certification							

14. Please rate the extent to which you agree that the following certification requirement act as barriers to international market access for local cocoa processors.

Certification requirements	Strongly disagree **(1)**	Disagree **(2)**	Somewhat disagree **(3)**	Neutral **(4)**	Somewhat agree **(5)**	Agree **(6)**	Strongly Agree **(7)**
Fair Trade							
Organic							
Rainforest Alliance							
UTZ Certification							

15. To what extent do you agree that the following certification compliance is costly to the cocoa sector?

Certification compliance	Strongly disagree **(1)**	Disagree **(2)**	Somewhat disagree **(3)**	Neutral **(4)**	Somewhat agree **(5)**	Agree **(6)**	Strongly Agree **(7)**
Fair Trade							
Organic							
Rainforest Alliance							
UTZ Certification							

16. Based on the following policy interventions rate how helpful they would be in upgrading the cocoa value chain.

Policy interventions	Not at all helpful**(1)**	Slightly helpful**(2)**	Somewhat helpful **(3)**	Moderately helpful **(4)**	Quite helpful **(5)**	Very helpful **(6)**	Extremely helpful **(7)**
Enforcement against deforestation and child labor							
Supporting the development of local cocoa processing industries.							
Trade agreements to strengthening market access for cocoa products							
Investment in R&D for improved cocoa varieties							
Implementing price stabilization mechanism for cocoa beans							
Investment in processing infrastructure							
Providing training and technical assist to farmers on sustainable practices.							

17. In your opinion, how well-known are local cocoa brands internationally?

	Please tick appropriate
Not known at all (1)	
Very rarely recognized (2)	
Slightly recognized (3)	
Moderately recognized (4)	
Somewhat well-known (5)	
Well-known (6)	
Highly recognized & established (7)	

18. To what extent do you agree that the following branding/ marketing strategies is effective in promoting locally cocoa product to global market and enhance international competitiveness.

Branding/ marketing strategies	Strongly disagree **(1)**	Disagree **(2)**	Somewhat disagree **(3)**	Neutral **(4)**	Somewhat agree **(5)**	Agree **(6)**	Strongly Agree **(7)**
Digital branding & e-commerce platforms							
Participation in international trade fairs							
Certification (e.g. organic/ fairtrade) to attract premium buyers							
Government backed promotional campaigns							
Geographical branding (e.g. Ghanaian cocoa product or Ivorian cocoa product)							

19. How would you rate the market potential of the following alternative cocoa-based industries?

Alternative cocoa-based industries	No potential **(1)**	Very low potential **(2)**	Low potential **(3)**	Moderate potential **(4)**	High potential **(5)**	Very high potential **(6)**	Exceptional potential **(7)**
Cocoa pharmaceuticals							
Cocoa-based cosmetics							
Cocoa Biofuels							
Cocoa-based food products (e.g. snacks & beverages)							
Cocoa Fiber/ Textiles							

20. To what extent do you agree that the following factors would encourage diversification within the cocoa-based industries.

Diversification factors	Strongly disagree **(1)**	Disagree **(2)**	Somewhat disagree **(3)**	Neutral **(4)**	Somewhat agree **(5)**	Agree **(6)**	Strongly Agree **(7)**
Financial incentives							
Market Demand							
Research and Development							
Policy Support							

Appendix 3. Survey Likert Scale

Scale	Numeric		Scale	Numeric		Scale	Numeric
Strongly disagree	1		Completely lacking	7		Extremely inaccessible	1
Disagree	2		Very lacking	6		Very inaccessible	2
Somewhat disagree	3		Largely lacking	5		Moderately inaccessible	3
Neutral	4		Moderately lacking	4		Neutral	4
Somewhat agree	5		Somewhat lacking	3		Moderately accessible	5
Agree	6		Slightly lacking	2		Very accessible	6
Strongly agree	7		Not at all lacking	1		Extremely accessible	7
No impact	1		Not at all	1		Not at all	1
Very low impact	2		Very little	2		Very slightly	2
Low impact	3		Little	3		Slightly	3
Moderate impact	4		Moderately	4		Moderately	4
High impact	5		Much	5		Considerably	5
Very high impact	6		Very much	6		Very considerably	6
Extreme impact	7		Extremely	7		Extremely considerably	7
Not at all helpful	1		Not known at all	1		No potential	1
Slightly helpful	2		Very rarely recognized	2		Very low potential	2
Somewhat helpful	3		Slightly recognized	3		Low potential	3
Moderately helpful	4		Somewhat well-known	4		Moderate potential	4
Quite helpful	5		Well-known	5		High potential	5
Very helpful	6		Highly recognized & established	6		Very high potential	6
Extremely helpful	7					Exceptional potential	7