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Improving firms' innovation to foster productivity and diversification

Competitive reinforcement of value chains in Ecuador

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GTC04

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CONTENTS

List of Figures.....	4
List of Tables.....	5
List of Boxes.....	6
Acknowledgements	7
Abbreviations	8
I. Introduction	9
II. Identification and screening of clusters	11
III. Competitive Reinforcement Initiatives: framework and methodology	18
IV. Preliminary Strategic Analysis of the coffee, cocoa, fish and wood products value chains.....	21
V. Diversification, innovation and productivity in agricultural value chains	32
VI. Cluster Development Programs: Rationale, Effects on Productivity and Institutionalization.....	35
VII. Conclusions and Recommendations	42
Annex A. Workshop participants	45
Annex B. Cluster screening methodology	46
Annex C. Competitive Reinforcement Initiative methodology.....	49
Annex D. Guidelines for local Sector-specific Public-Private Dialogue Practitioners ...	53
Annex E. References	55

LIST OF FIGURES

Figure II.1. Cluster Screening Methodology Flow Chart.....	12
Figure II.2. Cluster Mapping	16
Figure II.3. Ecuador Poverty map	17
Figure IV.1. Minimum Requirement to Compete / Value Chain in “Specialty Coffee” Strategic Segment	24
Figure IV.2. Minimum Requirement to Compete / Value Chain in “Bean-to-Bar Cocoa” Strategic Segment	27
Figure IV.3. Ways of Production vs. Ways of Consuming	29
Figure VI.1. Effects of Cluster Development Programs (CDPs)	36
Figure VI.2. Structure of Rutas Competitivas in Colombia	39
Figure VI.3. Clusterland Upper Austria Organization Chart.....	40
Figure VI.4. Micro and Small Entrepreneurs in Haiti’s CRIs	41
Figure B.1. Cluster Screening Methodology Flow Chart.....	46
Figure C.1. Strategic Segments and their Value Chains.....	50
Figure C.2. Value Chain Activities and Linkages Typologies	51
Figure C.3. Porter’s Five Forces.....	52

LIST OF TABLES

Table II.1. Scoring Legend for Weighting Clusters	14
Table II.2. Weighting for Potential Cluster Initiatives	14
Table II.3. Final List of Prioritized Industries	15
Table III.1. Matrix of Strategic Segmentation.....	19
Table IV.1. Strategic Segmentation of the Global Coffee Industry	22
Table IV.2. Strategic Segmentation of the Global Cocoa Industry	25
Table IV.3. Strategic Segmentation of the Global Fish Industry	27
Table IV.4. Types of companies in the Wood Industry by Province	29
Table IV.5. Strategic Segmentation for Contract Manufacturing	30
Table V.1. Upgrading Strategies in Agricultural GVCs.....	32
Table VII.1. Matrix of Strategic Segmentation	49

LIST OF BOXES

Box IV.1. Bain's Proposed Investments for the Coffee, Cocoa, Fish, and Wood Industries	21
Box VI.1. Brazil Cluster Programs Using the CRI Methodology	38
Box VI.2. Rutas Competitivas in Colombia	39
Box VI.3. Clusterland Upper Austria	40
Box VI.4. Haiti Enterprise Support Service (SAE)	41

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ABBREVIATIONS

AIMA	<i>Asociación Ecuatoriana de Industrias de la Madera</i>
ANECAFE	<i>Asociación nacional de exportadores de café</i>
ATPT	<i>Agendas para la Transformación Productiva Territorial</i> (Agendas for Productive Territorial Transformation)
ASOTECA	<i>Asociación Ecuatoriana de Productores de Teca y Maderas Tropicales</i>
CDP	Cluster Development Program
ECLAC	Economic Commission for Latin America and the Caribbean
ECMP	<i>Estrategia Nacional para el Cambio de la Matriz Productiva</i> (National Strategy for the Change of the Productive Matrix)
EU	European Union
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GVCs	Global Value Chains
IDB	Inter-American Development Bank
INEN	Servicio Ecuatoriana de Normalizacion
KIBS	Knowledge Intensive Business Services
LMICs	Low- and middle-income countries
MAGAP	<i>Ministerio Coordinador de Produccion, Empleo y Competitividad</i> (Coordinating Ministry for Production, Employment and Competitiveness)
MCPEC	<i>Ministerio de Agricultura, Ganaderia, Acuacultura y Pesca</i> (Ministry of Agriculture, Livestock, Aquaculture and Fishing)
MIPRO	<i>Ministerio de Industrias y Productividad</i> (Ministry of Industry and Productivity)
NLTA	Non-Lending Technical Assistance
NQI	National Quality Infrastructure
PPD	Public-Private Dialogue
RCA	Revealed Comparative Advantage
SAE	Servicio de Acreditacion Ecuatoriano
SENESCYT	<i>Secretaria Nacional de Educación Superior, Ciencia, Tecnología e Innovación</i>
SME	Small and Medium Enterprise
SPPD	Sector-Specific Public-Private Dialogue

I. INTRODUCTION

1. Increasing competitiveness and economic diversification are critical priorities for achieving growth and structural transformation in Ecuador. A deceleration of productivity growth, coupled with heavy reliance on the exploitation of natural resources and stagnating export diversification have resulted in lower competitiveness in Ecuador in recent years. This loss in competitiveness is exacerbated by falling oil prices and appreciation of the U.S. dollar. The confluence of these factors has resulted in fiscal constraints for the government and make the improvement of productivity and diversifying the product basket even more urgent (World Bank Group, 2016).

2. While productivity and diversification have been consistent policy priorities in recent years, economic conditions have worsened overall in Ecuador. Significant efforts have been made by the Government of Ecuador and its partners to prepare a policy framework and agenda around diversification, or more popularly, the “transformation of the productive matrix”. In 2010, the Coordinating Ministry of Production, Employment and Competitiveness (MCPEC) led the preparation of “Productive Territorial Transformation Agendas”, which aimed, *inter alia*, to improve productivity, the quality of national production, and to diversify products and services with increased value added, in particular for export. Then in 2014, the Vice-President’s Office published the flagship report called the “National Strategy for the Change of the Productive Matrix”, which can be seen as the seminal policy statement and vision for economic diversification during the second term of President Correa. In 2015, the Government of Ecuador hired Bain & Company to undertake a consultancy entitled “*Ecuador Productivo 2025*”, which analyzed productive chains in agricultural, agro-forestry, fishing industries and intermediate Industries and presented investment strategies for their growth. Finally, in 2014, the Economic Commission for Latin America and Caribbean (ECLAC) undertook studies on the tourism, software, cocoa, shrimp, capital goods, medicine for human consumption and solid waste value chains for the Vice-President’s Office.

3. This report presents the technical assistance provided to the Ministry of Industry and Productivity (MIPRO) over the course of 2016 to prioritize value chains and clusters in an effort to improve productivity and increase domestic value-added. This non-lending technical assistance (NLTA) implemented one of the areas recommended for technical assistance in the 2015 World Bank Group Technical Note “Fostering productivity for Export and Growth”, (World Bank Group, 2015) and builds on previous work undertaken by the World Bank Group in Ecuador on the themes of productivity, innovation and diversification. As such, the primary audience for this report is MIPRO. The report moves further beyond reporting on the technical assistance for the prioritization of value chains and provides: (i) an overview of the framework and methodology for Competitive Reinforcement Initiatives (CRIs), including selected analytical tools; (ii) a preliminary strategic analysis of the coffee, cocoa, fish and wood products industries; (iii) a discussion on the linkages between diversification, productivity, innovation and agricultural value chains; and, (iv) a presentation of Cluster Development Programs (CDPs) including their effects on productivity.

4. While further improvements in Ecuador’s business climate are indeed necessary, this paper argues in favor of CDPs as an avenue for achieving improved competitiveness and productivity. From a regulatory policy point of view, Ecuador has seen various improvements in the enabling environment resulting from high public investment in infrastructure, namely, increased access to energy and road infrastructure.

However, firms still face numerous constraints, such as labor market rigidities and difficulties to access finance. While horizontal policies are imperative for an improved business climate, vertical policies and programs are often necessary in a context of limited public resources.

5. The need to diversify exports also calls for a deepening of Ecuadorian firms' integration into Global Value Chains (GVCs) through upgrading¹ and linkages to buyers. Government can play a role in supporting firms to become more competitive by setting up the institutional structure that would support local clusters to integrate or upgrade into GVCs. The Competitive Reinforcement Initiative (CRI) methodology presented in this report provides the initial steps of a complete CRI and the Cluster Development Programs (CDPs) discussed further on highlight a successful institutional arrangement for implementing CRIs.

6. This report is divided into seven sections. Section II presents the framework and cluster screening methodology applied by MIPRO through three workshops held in February, June and September 2016. The outcome of this screening process was the identification of 12 priority industries: Textiles and confection; furniture and wood products; cocoa; coffee, fish; palm; meat products; dairy products; fresh fruit; fresh vegetables; canned fruit and vegetable; and banana and plantain. A cluster map is also presented in this section. Section III presents the methodology for the initial steps of a CRI, including several analytical tools such as strategic segmentation, segment analysis and the five forces analysis. Section IV demonstrates the use of strategic segmentation, segment analysis and the five forces analysis for 4 of the 12 prioritized industries, namely: coffee, cocoa, fish, and wood products. Section V explores the linkages between productivity, innovation and diversification in agro-industry value chains. Section VI examines the rationale for CDPs, their effects on firm productivity, and the institutionalization of CDPs. It also presents examples of CDPs from four countries (Brazil, Colombia, Austria, and Haiti) and lessons learned from recent evaluations of these experiences. Section VII provides conclusions and recommendations.

¹ See typology of upgrading in Table V.1.

II. IDENTIFICATION AND SCREENING OF CLUSTERS

A. Framework

7. This paper considers clusters, which are “geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated organizations (such as universities, standard agencies, trade associations) in a particular field linked by commonalities and complementarities. There is competition as well as cooperation” (Porter, 1990). In other words, clusters are geographically concentrated firms in the same value chain. The value chain refers to the full range of activities that firms and workers perform to bring a product from its conception to end use and beyond (Gereffi, 2011). Value chains are typically visualized and analyzed through a value-added chain and cross-border network relationships. The concept of Global Value Chains has existed for several decades now and has evolved from a neat sequence of activities into more complex networks of production, in which participating firms are specialists in one activity and external international sourcing arrangements require inter-firm trade (Taglioni and Winkler, 2016). Value-added is defined as the total production in a given step of the production process, net of inputs. Typically, GVCs are governed by a lead firm who is the final buyer or producer but can include suppliers throughout the production process.

8. GVCs are particularly interesting from a development policy perspective, in terms of their utility for industrial upgrading, economic development, employment creation and poverty alleviation (Gereffi, 2005). The opportunities provided by GVCs, particularly for low- and middle-income countries (LMIC) to specialize in only one or a few of the segments of a value-added chain, knowledge transfer, technology spillovers or foreign direct investment are attractive for policy makers. But competition is fierce and LMICs face a set of challenges to enter international production, upgrade to high-value added products, tasks, and sectors (Taglioni and Winkler, 2016).

9. Given the motivation of MIPRO to develop value chains, the cluster approach makes it possible to carry out the identification of the determinants of competitiveness in very specific and operative terms and later [to develop] lines of action for cluster improvement (Duch, 2004). Cluster selection processes can vary greatly, from top-down to bottom-up, competitive (e.g. call for proposal) or non-competitive and can range from technical to more political methods. As such, cluster selection processes are unique to each country and also depend on institutional arrangements and capacities (Casaburi and Pittaluga, 2016).

B. Methodology

10. Selecting clusters is a precursor to any Cluster Development Program (CDP). The cluster screening methodology presented in this report was developed by The Cluster Competitiveness Group, Inc. (Competitiveness). This methodology is rooted in business strategy and cluster change management, which are both equally important when undertaking a cluster competitive reinforcement initiative. The methodology for strategic analysis is based on the concepts developed by Michael E. Porter in his various publications on competitiveness.

11. The cluster screening methodology consists of five steps: (1) identification of companies in the region, (2) definition of businesses in the region, (3) criteria for

cluster definition, (4) criteria for cluster selection, and (5) preliminary strategic analysis. This methodology is presented below in Figure II.1:

Figure II.1. Cluster Screening Methodology Flow Chart

Source: Competitiveness (www.competitiveness.com).

C. Technical Assistance: Application of the screening methodology

12. From February to September 2016, the World Bank Group provided technical assistance to MIPRO through three technical workshops held in Quito, Ecuador. The objective of this technical assistance was to present a methodology to screen value chains in order for MIPRO to select a first list of value chains² with a view to possibly implementing a CDP in the future. These value chains are not “priority” value chains per se, but were rather identified as a first group of value chains that MIPRO could select in order to support in making more innovative and competitive. MIPRO could continue to select various value chains to support over time. What is more important than “picking” sectors, is the institutionalization of a program that can support them, which is discussed in greater detail in Section 6. In August 2016, during the period of the technical assistance, MIPRO unveiled its Industrial Policy for 2016-2025. As such, this was brought into the screening exercise. A description of the application of the screening methodology as carried out in the technical workshops with MIPRO are detailed in Annex 2. The team that participated in the prioritization is listed in Annex 1.

13. Based on the criteria selected by MIPRO, the following 12 industries were identified for further support: Textile and apparel; furniture and wood products; cocoa; coffee; fish; palm; meat products; dairy; fresh fruit; Fresh vegetables; conserved fruit and vegetable; and banana and plantain. In the process of identifying

² Note on terminology: in this paper, at the national level, we refer to sector and at the local level we refer to cluster and value chain interchangeably. It is more difficult to speak of value chains at the national level because as we will see in Section 4, each sector is comprised of various strategic segments, which each have their own value chain due to different processes and products.

the businesses, it was decided that the following would be excluded in this first group for the following reasons:

- **Metal-mechanics:** when analyzing the value chain for metal-mechanics, it was evident that metal-mechanics was not a business in and of itself, but rather was a business that was part of other value chains (e.g. food production, construction, energy, textiles and apparel, wood production, etc...);
- **Pharmaceutical products:** based on the company data available, only 26 companies were counted across the country, divided between Pichincha, Guayas and Tungurahua. As such, this industry did not meet the criteria of critical mass of companies in a given province;
- **Flat steel:** Similar to metal-mechanics, flat steel is part of other value chains such as automotive and petroleum;
- **Shipbuilding:** While Ecuador has a long history of shipbuilding, the industry could not meet the criteria of critical mass of companies. The Industrial Policy aims to attract investment for the construction of a shipyard for the construction and repair of ships, requiring an investment of USD 240 million;
- **Pulp:** In the case of pulp, this industry doesn't exist yet as there is no pulp mill in the country. The Industrial Policy plans to develop the industry, which would require investment in commercial forests and the construction of a pulp plant. The Industrial Policy states that a plant which could produce pulp and carton could substitute current imports, which equals USD 380 million. The inclusion of pulp in the Industrial Policy is more geared towards the creation of this industry through the construction of a pulp plant (USD 2 billion) and investment in a commercial forest (USD 800 million);
- **KIBS, logistics, and transport:** these areas were excluded because they are horizontal services and Cluster Development Programs tend not to focus on non-tradable, horizontal services. Secondly, the August 2015 Action Plan for KIBS developed by the World Bank Group for MIPRO provides extensive recommendations on instruments and programs to increase supply and demand of knowledge intensive services in Ecuador.³

14. In a few cases, industries were further segmented given their large size. For example, “fruits and vegetables” was disaggregated into the following groups: fresh fruit; fresh vegetable; conserved fruit and vegetable; and banana and plantain. Banana and plantain were separated from fresh fruit given their substantial contribution to the economy in terms of exports and employment. An additional challenge for banana and plantain is that they are not under the institutional jurisdiction of MIPRO but rather MAGAP, given that there is no transformation or post-harvest treatment done to the banana or plantain after it is harvested. Nonetheless, banana and plantain were retained as they represent a significant amount of exports and employment in the country.

i. Scoring

15. In order to quantify and rank cluster importance and potential, a weighting was applied to each industry (Table II.1). The weighting gives a score of 1 to 5 for each of the factors considered in the prioritization exercise: critical mass of firms; exports; employment and innovation. The innovation scores are based on a composite indicator of

³ See “Plan de Accion de Servicios Industriales en Ecuador: Promocion de la oferte y la demanda de servicios intensivos en conocimiento” (World Bank Group, 2015).

firm's self-reported innovation level and international innovation score. The data comes from the 2013 National Innovation Survey.

Table II.1. Scoring Legend for Weighting Clusters

Critical mass (average of provinces)	Point	Exports (\$ millions)	Point	Employment (average of provinces)	Point	Innovation	Point
1 to 99	1	1 to 99	1	1 to 999	1	0-2.99%	1
100 to 199	2	100 to 299	2	1000 to 1999	2	3-5.99%	2
200-299	3	300 to 499	3	2000 to 3999	3	6-8.99%	3
300-399	4	500 to 999	4	4000 to 14,999	4	9 -11.99%	4
>400	5	>800	5	>15,000	5	>12%	5

Table II.2. Weighting for Potential Cluster Initiatives

	Critical mass	Exports	Employment	Innovation	Total	Rank
Textiles and apparel	5	1	5	1	12	1
Furniture and wood products	4	3	2	1	10	3
Cocoa	1	5	1	4	11	2
Coffee	1	2	1	5	9	4
Fish	1	5	4	2	12	1
Palm	1	2	3	1	7	5
Meat products	2	1	4	2	9	4
Dairy products	1	1	2	2	6	6
Fresh fruit	1	1	2	1	5	7
Fresh vegetables	1	1	1	N/A	3	8
Canned fruit and vegetables	1	3	4	3	11	2
banana and plantain	1	5	5	N/A	11	2

Table II.3. Final List of Prioritized Industries

	Business	Firms (INEC, 2014)	Size of cluster per province	Exports (millions of dollars) Trademap 2015	Overall export share (%) Trademap 2015	Employees (INEC, 2014)	Overall employment share (%) INEC, 2014	Employees per province	Composite indicator of innovation (Encuesta Nacional de innovación, 2013)	Final ranking
1	Textile and apparel	9750	Pichincha: 2,481	\$ 93	0.5%	115,937	1.6%	33,782	2.4%	1
			Tungurahua: 1,201					14,281		
			Azuay: 758					9,013		
			Imbabura: 487					5,791		
2	Furniture and wood products	3097	Pichincha: 927	\$308	1.68%	12,769	0.18%	5,696	2.6%	3
			Azuay: 504					2,475		
			Guayas: 461					2,550		
			Tungurahua: 312					655		
			Manabí: 229					275		
			Imbabura: 189					331		
			El Oro: 144					213		
			Cotopaxi: 140					262		
			Loja: 122					193		
			Chimborazo: 69					119		
			Guayas: 84					3191		
3	Cocoa	687	Esmeraldas: 76	\$812	4.4%	6,649	0.10%	199	11.8%	2
			Manabí: 71					332		
			El Oro: 68					266		
			Pichincha: 31					930		
			Los Ríos: 29					332		
			Manabí: 54					25		
4	Coffee	314	Loja: 51	\$147	0.8%	2,554	0.04%	102	14.9%	4
			El Oro: 34					51		
			Manabí: 116					16,023		
5	Fish	567	Guayas: 94	\$1,300	7.1%	38,150	0.55%	17,549	5.0%	1
			Esmeraldas: 82					382		
			Santa Elena: 49					1145		
			Pichincha: 31					1145		
			El Oro: 30					1145		
			Pichincha: 49					7724		
6	Palm	423	Guayas: 39	\$226	1.2%	19,310	0.28%	1159	2.7%	5
			Manabí: 33					3090		
			Tungurahua: 31					193		
			Los Ríos: 29					1159		
			Esmeraldas: 25					2703		
			Pichincha: 248					15685		
7	Meat products	2547	Manabí: 230	\$41	0.2%	49,017	0.71%	2451	3.8%	4
			Azuay: 182					3921		
			El Oro: 146					1471		
			Tungurahua: 139					2941		
			Loja: 127					980		
			Guayas: 106					9313		
			Chimborazo: 85					980		
			Pichincha: 198					7841		
			Tungurahua: 131					1069		
8	Dairy products	1477	Manabí: 128	\$6.9	0.04%	17,821	0.26%	713	4.5%	6
			Azuay: 128					1426		
			Chimborazo: 105					535		
			Cotopaxi: 103					1247		
			Imbabura: 76					713		
			Canar: 75					178		
			Carchi: 73					535		
			El Oro: 66					178		
			Guayas: 60					2139		
			Loja: 44					178		
			Bolívar: 40					178		
			Manabí: 100					618		
			Guayas: 95					5715		
			Pichincha: 87					1545		
9	Fresh fruit	1060	El Oro: 71	\$80	0.44%	15,446	0.22%	2626	1%	7
			Imbabura: 65					154		
			Tungurahua: 62					154		
			Lor Ríos: 62					1081		
			Azuay: 61					309		
			Chimborazo: 42					154		
			Loja: 38					46		
			Esmeraldas: 32					309		
			Pichincha: 154					3887		
			Imbabura: 111					114		
10	Fresh vegetables	1124	Tungurahua: 102	\$27	0.15%	11,373	0.16%	227	N/A	8
			Chimborazo: 91					102		
			Azuay: 89					151		
			Cotopaxi: 69					609		
			Manabí: 61					203		
			Guayas: 49					4485		
			Carchi: 48					114		
			Loja: 38					41		
			Canar: 34					102		
			Pichincha: 36					5139		
11	Canned fruit and vegetables	150	Guayas: 36	\$393	2.1%	10,707	0.15%	40226	6.80%	2
12	Banana and plantain	125	Los Ríos: 30	\$2,820	15%	69,355	1%	10403	N/A	2
			El Oro: 25					14565		

D. Cluster Mapping

16. Cluster mapping is a common tool that provides a visualization of the geographical concentration of a cluster and can help businesses, policy makers, and researchers understand the dynamics of a cluster or inter-linkages between them. Normally, cluster mapping is done at the beginning of a CRI project at the local level. In the case of this report, a cluster mapping was done at a national level (Figure II.2), to identify the location of the clusters prioritized by MIPRO.⁴

Figure II.2. Cluster Mapping

17. What stands out from the cluster mapping is the absence of clusters identified in the eastern region of the country, from Sucumbíos all the way down to Zamora Chinchipe. However, this does not mean that MIPRO cannot undertake Competitive Reinforcement Initiatives in these provinces. Furthermore, if so desired by a government, the cluster screening exercise (step 3) can include government priorities or regional development strategies. In the case of the eastern provinces in the cluster map above, the Productive Territorial Transformation Agendas (ATPT) revealed the existing businesses in these areas, including: essential oils/natural cosmetics and tourism in Napo; essential oils/natural cosmetics in Orellana; and ten different businesses in Morona Santiago including: dairy products, Amazonian fruit pulp, meat products, wood furniture, wood for construction and tourism.

18. Another rationale for cluster selection can be poverty reduction. For Ecuador, the poverty map in Figure II.3 shows the highest poverty rates in Napo, Chimborazo and Morona Santiago, followed by Sucumbios, Orellana, Pastaza, Zamora Chinchipe,

⁴ The map may not completely reflect the geographic location of clusters. While the ATPT identified the location of the businesses, data from INEC locates the firm where the headquarters is rather than where the production is actually happening. Given the mixture of these two data sources, there may be some inaccuracy in the map.

Esmeraldas, Bolivar and Cotopaxi. These provinces also tend to high Gini coefficients. As such, aligning government policy priorities, such as continuing to reduce poverty in provinces with the highest poverty levels, can be integrated into the criteria for cluster screening.

Figure II.3. Ecuador Poverty map

Source: Molina, 2015.

III. COMPETITIVE REINFORCEMENT INITIATIVES: FRAMEWORK AND METHODOLOGY

A. Framework

19. The linear model of structural change, from agriculture to industry and to services, has been radically changed by globalization and the division of labor (Rodrik, 2013). Not all value chain activities can act as a stepping stone to the next. Indeed, each value chain activity has a different potential to catalyze economic development and productive transformation.⁵ Therefore, as we move into a new, more uncertain phase of industrialization, it is important to understand *where and how value is created* within the global value chain so as to know which value chain activities to compete for.

20. The Competitive Reinforcement Initiative (CRI) methodology, was adopted by the European Foundation for Cluster Excellence as a field project methodology, to apply learnings of the training program for professionals of economic development.

It is a methodology used in many cluster development programs, such as the example of Brazil presented in section 6.2 of this document. The CRI methodology employs a Ten Step⁶ analytical tool that has been widely used in Europe⁷ and Latin America⁸ in the last 15 years⁹, and it is now being tested by the World Bank Group in Haiti and Croatia. However, similar cluster competitiveness initiatives have been implemented widely in Latin America since the early 2000s. The analytical methodology allows to move beyond trade data which usually quantifies ‘how much value’ is created by each country participating in a GVC, toward ‘how the value’ is created and ‘where in the chain’ to help policymakers to promote shared value and prosperity. The CRI methodology is one type of methodology used in CDPs, which are described and discussed more broadly in Sections 7 and 8.

B. Methodology

21. The CRI methodology includes strategic analysis based on the concepts developed by Michael Porter, in his books “Competitive Strategy” (1980), “Competitive Advantage” (1985), “The Competitive Advantage of Nations” (1990) and “On Competition” (1998). The *Five Forces* and the *Value Chain* are frameworks commonly used in the analysis. The strategic analysis is combined with sector-level public-private dialogue with the cluster agents to promote the change process. Guidelines for public-private dialogue for sector competitiveness and local economic development are presented in Annex 4. A CRI is a type of Cluster Development Program. The CRI methodology is presented in more detail in Annex 3.

⁵ “Objectives, challenges, opportunities and potential next steps”, Industry-Specific Global Value Chain Analysis - P149454 (World Bank Group 2015)

⁶ Duch, “Att mobilisera för regional tillväxt”, Studentlitteratur (Lund 2004)

⁷ European Foundation for Cluster Excellence- Field Project Methodology - Technical Notes (Barcelona 2013)

⁸ Combining Strategic Analysis and Change Management – Best Practices in Implementation Paper Series - (USAID 2009)

⁹ Case studies of clustering efforts in Europe (Europe Innova Cluster Mapping Project, 2008)

22. This section highlights two analytical tools used in the CRI process: (1) Strategic Segmentation and (2) Segment Analysis (Five Forces Analysis).

i. Strategic segmentation

23. The Strategic Segmentation of a particular industry seeks to answer the following two questions:

- (a) What are the different “businesses” that exist in the industry?
- (b) What will the industry consist of “tomorrow”? By looking at the trends and in which direction the industry is heading.

24. As can be seen in Table III.1, the Matrix of Strategic Segmentation contains all the strategic segments of an industry. The strategic segmentation provides a global overview of the different businesses that exist in a particular sector, and is not country specific.

Table III.1. Matrix of Strategic Segmentation

		users / markets		
		?	?	?
products / services	?	Strategic Segment 1	Strategic Segment 2	Strategic Segment 3
	?	Strategic Segment 4	Strategic Segment 5	Strategic Segment 6
	?	Strategic Segment 7	Strategic Segment 8	Strategic Segment 9

25. Each strategic segment is a function of both the product (or service) and the user (or market group) that the product/service serves. The strategic segments are distinct from one another because the Porter’s Five Forces¹⁰ are different; therefore, the value chain of each segment is also different. As such within a sector, each strategic segment will have its own value chain.

ii. Segment Analysis

26. Once the different strategic segments are identified in the matrix, then each needs to be analyzed. This analysis fosters to answer the two following questions:

- (a) What would it take for any country/region to compete in this segment that has

¹⁰ Porter’s Five Forces Analysis is a very useful tool for business strategists. It is based on the observation that profit margins vary between industries, which can be explained by the structure of an industry – “Note on the Structural Analysis of Industries” (Michael E. Porter, 1980)

been identified?

- (b) What does our country/region (the one we are analyzing) have? What doesn't it have? What policy needs to change? What investments need to be made?

27. In order to answer these questions, different strategic tools will be used. For each strategic segment it is necessary to identify the value chain required at a global level, not country-specific. Porter's Five Forces and the challenges and opportunities for development in the region/country that we are analyzing are important in this analysis.

28. Through Porter's Five Forces framework, it is possible to assess the attractiveness of each strategic segment in a given industry by analyzing how profitable the segment is, and which actors have the most bargaining power and therefore which actors retain the bulk of said profit. Michael Porter posited in 1979 that "the state of competition in an industry depends on five basic forces". The profitability of the segment depends basically on three of them: the threat of new entrants, the threat of substitute products or services; and jockeying for position among current competitors. The question of who retains the margin depends on the other two forces: the bargaining power of suppliers and the bargaining power of customers. The combination of the forces will make the segment more or less attractive.

29. The last part to be considered of each strategic segment is to identify which are the challenges and opportunities for development in the region or country that is being considered. It means comparing the "ideal value chain" identified with the "real value chain" in that region / country. The comparison will identify which activities of the value chain are missing, and thus are the areas of improvement that this region / country should work on in order to compete in that strategic segment. This will then be translated into actions, policies to change or make and investments to be made.

IV. PRELIMINARY STRATEGIC ANALYSIS OF THE COFFEE, COCOA, FISH AND WOOD PRODUCTS VALUE CHAINS

30. This section undertakes a preliminary strategic analysis of the coffee, cocoa, fish and wood products industries, selected from amongst the prioritized value chains in Section II. The analysis takes into consideration the recommendations and analysis undertaken by Bain and Co. in their “Integral Strategic Plan for Agroforestry, Fish and Aquaculture in Ecuador” report, with a view to presenting the industries through the strategic analysis lens presented in Section III, in order to stimulate alternative ideas to improve innovation and competitiveness of these industries. The analysis presented in this section is differentiated from the Bain Report in that it aims to take a more didactic approach in order to demonstrate to MIPRO the use of the strategic analysis tools (strategic segmentation and segment analysis/five forces analysis) based on the four aforementioned industries. The intention is that MIPRO would be able to replicate such analysis at the local level with local clusters. While the Bain Report focuses on increasing the GDP and growth rate for the selected industries, there is little to no focus on the producers, poverty reduction and shared prosperity. Box IV.1 outlines the recommendations in the Bain report for these four industries.

Box IV.1. Bain’s Proposed Investments for the Coffee, Cocoa, Fish, and Wood Industries

In 2015, Bain & Company produced the report entitled “*Ecuador Productivo 2025*” for the Government of Ecuador. The Report prioritizes and analyzes productive chains in agricultural, agro-forestry, fishing industries and intermediate Industries and presented investment strategies for their growth. Below, the investments proposed for the development of the four value chains examined in Section 4 of this report are presented.

Industry	Recommendation	Total investment required
Coffee	4 new plants for instant coffee production by 2025 for a total investment of US\$400 million and the creation of 1000 direct jobs.	US\$400 million
Cocoa	12 additional cocoa processing plants needed by 2025, which represents US\$600 million of investment and 2400 direct jobs; 3 chocolate-making plants needed by 2025, which represents US\$60 million in investment and 90 direct jobs.	US\$660 million
Fish	28 new plants for an investment of US\$82 million and approximately 2000 direct jobs by 2025. Investment to improve fishing vessels (currently artisanal) would cost US\$34 million.	US\$116 million
Wood products	6 new plants to process wood planks by 2025 at US\$50 million each and 250 direct jobs.	US\$300 million

Source: Bain & Company, Plan Estratégico Integral de Agroforestal, pesca y Acuicultura en el Ecuador (2015).

A. Coffee

31. In the 2015 Integral Strategic Plan for Agroforestry, fish and Seafood in Ecuador, published by Bain and Company, the chapter on the “Coffee Chain and its byproducts” focuses primarily on “café soluble”, which is freeze-dried instant

coffee, such as the popular Nescafé brand. The strategy posited through the chapter on coffee is to increase production so as to increase instant coffee exports. The Bain report chooses not to look into specialty coffee because it represents such a small proportion of the global coffee market. Although it states that this could be an interesting option for some regions. This section does look more closely at specialty coffee. Specialty coffee is an important market segment for Ecuador to consider given that current coffee production has decreased drastically in Ecuador from 3 million bags per year in 1996 to 300,000 bags in 2015. If the quantity of coffee produced in Ecuador is declining, then the specialty coffee market – where margins are much higher and buyers are seeking quality over quantity – is an important market segment to consider. The retail value of the U.S. coffee market is estimated to be US\$48 billion, with specialty comprising approximately 55% value share.¹¹ Ecuador now imports more than 1 million bags of Robusta coffee (2014) for its café soluble, primarily from Vietnam. This inability to produce the primary material is a concern and affects the competitiveness of Ecuadorian café soluble because the competitive factors for café soluble is volume and price.

32. Below, two strategic analysis tools – strategic segmentation and the Five Forces Analysis – are applied to the global coffee industry. The strategic analysis done in this section is only preliminary since in order to do it with accuracy it is needed the CRI process of at least 4 months comprised of research on the global industry (by doing interviews and benchmarking trips to learn from the best references of the sector in the world) and also local research in Ecuador (by doing interviews to the local cluster agents of the sector). Table IV.1 below presents the strategic segmentation of coffee.

Table IV.1. Strategic Segmentation of the Global Coffee Industry

		users / markets	
		Consumption for caffeine (Commercial coffee)	Consumption for flavor (Specialty coffee)
products / services	Coffee beans (in a bag)	Strategic Segment A1	Strategic Segment A2
	Branded or non-branded coffee ready for consumption (i.e. roasted)	Strategic Segment B1	Strategic Segment B2
	Coffee prepared in a coffee shop	Strategic Segment C1	Strategic Segment C2

33. Ecuador competes in the instant coffee market segment (B1 in Table IV.1 above). A1, B1 and C1 are segments of commercial coffee and A2, B2, and B3 are segments of specialty coffee.

¹¹ <http://www.scaa.org/?page=resources&d=facts-and-figures>

34. In Segment A1 (coffee beans for consumers seeking caffeine), the Barriers to entry are relatively low, with geography – i.e. being positioned in a tropical climate (between the tropic of cancer and the tropic of Capricorn) - being the most important barrier. Commercial coffee can be a mix of both Robusta and Arabica coffee beans. Ideal temperature for Robusta coffee is 15 to 24 degrees Celsius and grown between sea-level and 800 meters. Whereas Arabica coffee is grown ideally between 24 to 30 degrees Celsius and does better in higher altitudes (e.g. above 1300 meters). As such, depending on the type of commercial coffee being produced, altitude can also be an important barrier to entry. Robusta coffee beans contain almost twice the caffeine as Arabica. There are several *Substitution products* (i.e., substitutes for caffeine) for segment A1 including tea, soda, and energy drinks. There are many other coffee regions, countries, and producers; as such, there is a strong *rivalry* within this segment. Thus, the profitability of this segment is reduced.

35. On the other hand, if the coffee producers are at the center of the five forces axes, then their buyers are mainly five industry giants, who control approximately 50% of the commercial coffee market. These are Nestle, Kraft, Procter and Gamble, Sara Lee, and Tchibo. These companies are large multinationals with strong negotiating power. As such, *the negotiating power of buyers* is strong in front of the coffee producers in the countries and regions where the coffee grows. Therefore, the five industry giants will retain most of the profit of this business.

36. As such, the attractiveness of this segment for the coffee producers is low. This predominance of the buyers also prevails as the main force shaping competition in segments B1 and C1. Furthermore, the consumer in segments A1, B1 and C1 are all motivated by price only.

37. However, how is this different in segment C2? Figure IV.1 shows the value chain for the specialty coffee strategic segment. (Note: this is generalized due to the lack of local information.)

Figure IV.1. Minimum Requirement to Compete / Value Chain in “Specialty Coffee” Strategic Segment

Source: Emiliano Duch, World Bank Group.

KEY: NRE = Natural Resource; LAB = Labor intensive activity; CAP = Capital intensive activity; KNL = Knowledge intensive activity;

Note: Box size indicates scale of activity and significance to value chain structure (qualitative judgement).

38. In segment C2, by comparison, coffee is sold in a coffee shop to consumers seeking flavor and experience. The *barriers to entry* are relatively high because there are investments in equipment and know-how to open a coffee shop. As such, this is a positive force for the attractiveness of this segment. There are no *substitute products*, as such, this force has a positive effect on the attractiveness of this segment. Given that this is a high-quality product and there are no substitutes, there is a lot of margin in this segment. There are much fewer producers in this segment, so rivalry is weak. Negotiating power of suppliers is weak. The buyers are shrewd consumers ready to pay the high price for the product. As such, the margins are better distributed in this segment. In conclusion, there is more money to be made in this segment and the 5 forces have a positive effect on the attractiveness of this segment.

39. An independent coffee roaster, like the Portland Roasting Company (located in segment B2), sells a 12 oz bag of whole beans for US\$19.00 (or \$1.58/oz). In comparison, 12 oz of whole beans from other commercial coffee companies vary – e.g. Lavazza (\$0.48/oz), Peet’s Coffee, Kicking Horse coffee (\$0.81/oz), Starbucks (\$0.6-\$1.00/oz) or Caribou Coffee – but on average are below \$1.00/oz.¹² But where is the value-added that warrants this price increase. If we look at the characteristics that advanced independent roasters are looking for, we see a few criteria for purchase, including: direct relationship with the coffee producers to explain his story and say from which farm comes from (similar to the winery in the case of the high quality wine), quality and a relationship based in trust. It means that the switching cost for the roaster to change the coffee producer, who they buy the coffee beans, is higher than in the Commercial Coffee. In that one it was a relationship based in price, so if there is a cheaper coffee

¹² Prices taken from amazon.com (January 2017)

producer the purchase manager of Nestle for example, will switch to him automatically. Whereas in the specialty coffee segment, the buyer wants to be sure that the coffee beans have enough quality (i.e. a minimum score of 80 points, out of 100)¹³ to be classified as Specialty coffee and control the traceability of the beans.

40. Certification, whether certified organic, Rainforest Alliance, or Fair Trade are not necessarily a requisite for the specialty coffee segment (altitude is a much more important criteria). Producers and supporting institutions should seek out certifications based on what the buyers require.

41. Even if the specialty coffee segment is a smaller proportion of the global coffee industry, this value chain provides more revenue to the country or region's producers due to the stronger relationship between the buyers and producers in this market segment.

B. Cocoa

42. The cocoa chapter in the Bain report focuses on the question of what proportion of cocoa beans to process in-country. (They come to the conclusion that 30-60% should be processed in Ecuador.) Given this line of questioning, it is determined that the high cost of cocoa beans is one of the main obstacles to manufacturing the cocoa beans and the focus is turned toward strategies for lowering this price (i.e., increasing productivity). Furthermore, the chapter is oriented toward investments in processing plants, which cost US\$50 million each, for a minimum capacity to process 60,000 tons of processed cocoa per year. What is lacking from this analysis is the distinction between the commercial and specialty chocolate segments. A strategic segmentation of the global cocoa industry (Table IV.2) divides the industry into 2 segments: Commercial cocoa for chocolate-lover/non-savvy consumer (A1) and Gourmet/specialty cocoa for the cocoa connoisseur (B2).

Table IV.2. Strategic Segmentation of the Global Cocoa Industry

		users / markets	
		Sugar-craving consumer	Cocoa/chocolate connoisseur
products / services	Commercial cocoa	Strategic Segment A1	-
	Gourmet or specialty cocoa	-	Strategic Segment B2

43. In segment A1, the Barriers to entry are relatively low, with climatic conditions being the primary barrier. Cocoa grows best in a belt between 10°N and 10°S of the

¹³ <http://www.scaa.org/?page=resources&d=cupping-protocols>

Equator. Temperature (maximum annual average of 30-32°C and a minimum average of 18-21°C), rainfall (annual rainfall of between 1,500 mm and 2,000 mm) is generally preferred), humidity (relative humidity is often as much as 100% during the day and 70-80% at night), light and shade, and soil conditions are all important variables for the optimum growth of the cocoa tree. The main *Substitution products* are sweets and candies. *Rivalry* is strong given that the barriers to entry are relatively low and there are many producers of sweets and candies. Positioning the cocoa producers at the center of the five forces, they have little negotiating power in the face of the large multinational companies dominating the cocoa industry. Like many agro-industry sectors, cocoa has also witnessed the tendency towards consolidation. Today, Barry Callebaut (Switzerland), Cargill (USA), and Olam account for about 60 percent of the world cocoa processing business (transformation from cocoa beans to butter, powder and liquor). The actual chocolate-makers (confectionery companies) include: Mars Inc. (USA), Mondelez International (USA) and Nestle SA (Switzerland), whose annual sales are all above US\$10 billion. Furthermore, as a global commodity, purchased and sold internationally on the world market, smallholder cocoa producers have no control over the commodity price and very little leverage to negotiate with buyers. On the other end, the negotiating power of suppliers (e.g. inputs) is low. As such, the attractiveness of this segment is low.

44. Segment B2 corresponds to the market segment of cocoa or chocolate connoisseurs. This consumer is consuming the chocolate for pleasure and appreciates differentiation of the cocoa based on flavor, quality, origin, etc... If the cocoa producers are the center of the five forces, the “buyers” are primarily smaller, independent specialty or “craft” chocolate makers, who invest their time in sourcing the highest quality cocoa and establishing a personal relationship with the farmers and cooperatives who supply the cocoa. The buyer also typically buys smaller volumes (e.g. less than a full container), which makes this segment also more interesting for smallholder farmers or cooperatives who cannot produce large volumes. Given the buyer’s investment in finding the best cocoa and establishing relationships with the suppliers, the switching cost is higher, making the buyer less likely to switch suppliers than in segment A1. This increases the negotiating power for the cocoa producers. The *barriers to entry* in segment B2 are the same, except the standards for quality fermentation are much higher. Given that the motivation of the consumer is pleasure and the differentiation between the different types of cocoa based on flavor, quality and origin, the substitute products would be other specialty products that are consumed for pleasure and can be differentiated based on flavor, quality and origin. These would include fine wine and cigars, for example.

45. Cocoa beans are traded on several world exchanges including the ICE Futures Europe, ICE Futures U.S. and NYSE Liffe Futures and Options. The average price in February 2017 was US\$ 2045.98 per ton. This would be the price for buyers in Segment A1. In contrast, Meridian Cacao Co. (a cocoa bean importer) a cocoa importer based in Portland, Oregon sells cocoa beans to craft chocolate makers for an average of US\$ 2500 per ton but will sell for \$4000-7000 per ton for the highest quality chocolate. Given that this is direct trade with fewer intermediaries, it is assumed that more of the margin ends up in the hands of the farmer and the farmer benefits from various social benefits, such as higher wages for staff and regular doctor visits to the farmer.¹⁴ Similar to the specialty

¹⁴ For example, see Farmer Field Notes for the Camino Verde cocoa farm in Ecuador: https://static1.squarespace.com/static/53f53106e4b0f3beda16ac23/t/54739a07e4b03fe7e3b5d073/1416862215870/FFN_CAMINOVERDE_RGB_web.pdf

coffee segment, the need for certifications will depend on whether the buyers demand it or not. Below a generalized value chain for “specialty cocoa” is presented.

Figure IV.2. Minimum Requirement to Compete / Value Chain in “Bean-to-Bar Cocoa” Strategic Segment

Source: Emiliano Duch, World Bank Group.

C. Fish

46. The chapter on fish in the Bain report focuses on fish production and fishing at the national level. The report presents several recommendations which emphasize increasing the productivity of the frozen fish plants, for example, or increasing shrimp production in aquaculture. However, what the report is missing is an analysis of the different possible businesses (strategic segments) within the fish industry, which requires different activities in the value chain, and therefore represents different challenges for the companies and agents competing. Table IV.3 shows some of the strategic segments in the fish industry.

Table IV.3. Strategic Segmentation of the Global Fish Industry

		users / markets	
		Consumption for basic feeding	Consumption for differentiation (health, environmentally friendly, convenience, quality)
products / services	Fresh Fish/Seafood whole piece	Strategic Segment A1	Strategic Segment A2
	Fish/Seafood processed long-term duration (frozen, canned, cooked)	Strategic Segment B1	Strategic Segment B2
	Fish/Seafood fresh processed (filleted, ready to cook, ready to eat), very perishable	-	Strategic Segment C2

47. As seen in Table IV.3, several strategic segments have different challenges for the companies competing in them. Segment B1, fish or seafood processed with a long-term duration (frozen, cooked, canned) for consumers seeking basic feeding, has different five forces than Segment C2, and therefore different levels of attractiveness.

48. In segment B1, competition in the last 10 years had been increasing as other country rivals are getting bigger and China has become an important player. This segment emphasizes reducing the cost of production, so the *barriers to entry* to compete in this segment include very efficient production plants, but with the threat that other countries with lower production costs can enter at any time. In terms of *substitutes*, since the consumer is seeking cheap protein, there are many substitutes, like chicken for example, for which the price has been declined steadily over the last 15 years. Thus, the margin in this segment seems to have been reducing over the last years and split amongst more players. Also, the margin at the end is mostly kept by the buyers, i.e. the retailers. Despite the large market size, the retailers are becoming increasingly consolidated which has increased their negotiating power. As such, when the buyers' main criteria for buying frozen fish is the price, they are willing to buy containers of fish from whomever offers the lowest price.

49. On the other hand, Segment C2 includes a new barrier to entry, which is the complexity of the logistics. Transporting fresh fish and seafood is very delicate, and the cold chain has to be guaranteed in order to ensure the quality of the food in the store. In this case, the fish cannot come from China because it has to be sourced more locally or be transported in a fast cold chain, which could include air transport in some cases. On the other hand, since the consumer is seeking healthy protein, there are fewer *substitutes*. Thus, the margin in this segment is higher and there is less rivalry to split the margin. While the buyers are still the large retailers (supermarkets) which are becoming increasingly consolidated, the main criteria for buying is no longer the price but the guarantee that the fish is delivered regularly (every day) in quality condition and with the right cold chain. The switching cost increases in this segment and the relationship with the buyer is based more on trust, given the need for more regular deliveries and stricter logistical conditions.

50. Therefore, some interesting questions can be asked at this point for Ecuador in response to the recommendations for the fish industry proposed in the Bain report. Namely, is investment in frozen treatment plants the most suitable investment for Ecuador?

51. When looking further at the production of fish or shrimp, in aquaculture or through traditional fishing, the analysis is even more interesting. As shown in Figure IV.3, both methods of production are converging at the point of commercialization for both of the strategic segments, but with different challenges. The key questions to ask include: "who is going to benefit from the investment in a shrimp production plant?"; "Are we trying to help the bigger companies with big production and aquaculture plants or the small communities of fishermen?"

Figure IV.3. Ways of Production vs. Ways of Consuming

D. Wood Products

52. According to the Bain report, wood production is primarily used for energy production (50%), mainly for the domestic market, and the rest is used to make boards, pulp and other products that can be used as input for other industries.

Table IV.4. Types of companies in the Wood Industry by Province

Product	Province	# Firms	Critical Mass	Support Institutions	Geographical concentration	Complex value chain	Markets
Sawn timber - Rough wood	Azuay	7	7%	ASOTECA AIMA	Low	Low	Local and Global
	Guayas	20	19%		High		
	Pichincha	22	21%		High		
	Santo Domingo	18	17%		Medium		
	Chimborazo	13	12%		Medium		
	Others	26	25%				
	Total	106					
Wood planks	Guayas	6	35%	AIMA FUNDEPIM	Medium	Medium	Local and Regional
	Pichincha	11	65%		High		
	Total	17					
Furniture and finishing products for the construction industry	Azuay	497	14%	AIMA FUNDEPIM	Medium	High	Local and Regional
	Guayas	435	13%		Medium		
	Manabi	229	7%		Low		
	Pichincha	896	26%		High		
	Cotopaxi	140	4%		Low		
	Chimborazo	69	2%		Low		
	El Oro	144	4%		Low		
	Imbabura	189	5%		Low		
	Loja	122	4%		Low		
	Tungurahua	312	9%		Low		
	Others	447	13%		Medium		
	Total	3480					

Source: MIPRO, 2016.

53. However, when analyzing the types of companies within the wood industry by province (Table IV.4), the data looks quite different from the national figures. As seen in the table above, the majority of companies are working in furniture and finishing products for the construction industry. Even without having the information of the number of employees or the aggregated revenues, the analysis can be done in a different way using the strategic segmentation tools, as done for the other sectors. In this sense, the interesting part is not to finish the analysis with the value chain until the logs become a board or pulp as it is done in the Bain report, but to finish the whole global value chain until it is a finished product satisfying a consumer need. For this reason, in order to do a

comprehensive analysis, then all the different applications of the wood should be analyzed separately. This means doing a strategic segmentation for each application: furniture, construction materials, paper, etc. This, combined with the challenges faced at each one of the regions, will become a different strategy to follow for each cluster. But again, for that, a CRI must be done for each local value chain (cluster) by doing the analysis based on local information collected in the field and undertaking a local diagnostic.

54. As an example, without entering into too much detail, below there is the strategic segmentation for the case of furniture for hotels and offices, what is known as Contract Manufacturing.

Table IV.5. Strategic Segmentation for Contract Manufacturing

		users / markets	
		Hotel furniture	Office furniture
products / services	Furniture	Strategic Segment A1	Strategic Segment A2
	Furniture + assembly	Strategic Segment B1	Strategic Segment B2
	Furniture + assembly + maintenance	Strategic Segment C1	Strategic Segment C2
	Furniture + all the rest of elements in the room + assembly + maintenance	Strategic Segment D1	Strategic Segment D2
	Rental service with all above included	Strategic Segment E1	Strategic Segment E2

55. In the case of the hotels, when looking at the Segment A1, hotel owners buying the furniture needed in a room, the value chain will start from wood production and end at furniture making. The *barriers to entry* are clearly very low, so all countries with cheap production can compete, thus the *rivalry* is high. China is buying logs from other parts of the world (including Ecuador) to produce cheap furniture. Regarding the *power of the buyers* in this case, it has been increased dramatically, since the hotels are concentrated in large hotel chains. Their main purchasing criteria is price, within the parameters of quality that they request. But overall, they will always try to find the best deal in cost.

56. Going down the rows of products/services presented in the segmentation above, the power of the buyers is decreasing, since there are other criteria entering into the purchasing negotiation: the assembly, the maintenance, the fact of not only buying the furniture but also the textiles in the room (curtains, blankets, etc.). The assembly and the maintenance are adding a local service aspect to the product, which means that

the supplier of furniture has to bring local staff to do the work, with an operational structure in place in order to provide maintenance on short notice. This again, as seen in other industries before, brings higher switching costs for the buyers. The hotel owner has a closer relationship with the supplier than previously, and the relationship is not based on something as fragile as price alone. The *barriers to entry* are also increasing, since the company providing the service has to be local, meaning the ones from China cannot compete. Thus, *rivalry* is clearly also lower.

57. In the last segment “E1,” the hotel owner directly rents the service of outfitting his/her hotel rooms. He pays a rental fee per room and the company providing the service will be the one in charge of purchasing the furniture, curtains, painting the room, assembling furniture, maintaining it, replacing it and anything else in order to have a perfect room according to the specifications of the hotel owner. In exchange, this company signs a contract with the hotel owner for 10-15 years.

58. However, some questions need to be made at this point: which companies are we aiming to help? The wood producers or the furniture makers? The answer will vary if the CRI is done in a province where the most number of companies are in wood production or furniture making. The attractiveness of one segment over another may vary based on which companies we seek to help.

V. DIVERSIFICATION, INNOVATION AND PRODUCTIVITY IN AGRICULTURAL VALUE CHAINS

59. The Revealed Comparative Advantage (RCA) index identifies sectors and products where Ecuador exceeds global export averages. In 2013, the sectors and products with the highest competitive advantage for Ecuador were: vegetables, animal products, food products and petroleum¹⁵. It comes as no surprise that 10 out of the 12 industries prioritized through the cluster screening exercise are in the agroindustry sector given the Latin American region's natural competitive advantage in agriculture due to its water and land resources. Latin America has approximately 28% of potential new arable land (second only to Sub-Saharan Africa) and also holds the highest share of renewable water resources (World Bank Group, 2013). As a net food exporter, Latin America has an important role to play in meeting the needs for global food security but at the same time needs to make improvements in their trade policy, logistics, production (scaling up output) in order to meet this challenge (Chaherli and Nash, 2013).

60. While Ecuador's export basket consists mainly of primary products, in particular agricultural and aquaculture-based industry, there is considerable scope to upgrade into higher value added products in these same industries. However, entering into higher value added products requires, inter alia, productivity improvements and technology adoption. These improvements and the types of technology or innovation needed can be directly informed through the CRI process. Ahmed and Hamrick (2016) present a typology for upgrading strategies in agricultural GVCs through three types: functional, product or process upgrading (Table V.1).

Table V.1. Upgrading Strategies in Agricultural GVCs

Upgrading Trajectory	Description	Conditions
Functional Upgrading	Increasing value added by changing the mix of activities conducted within the firm or moving the center of activities to different links in the value chain. Variables include: type and number of new activities absorbed or outsourced, new marketing or logistics functions or a change in management.	<ul style="list-style-type: none"> • Chain coordination • Developing business friendly policies • Incentives e.g. taxes • Private sector development
Product Upgrading	Developing higher value products for example by moving from production and trade in agriculture commodities to production of intermediary products. Variables include: investment in upgrading activities (as a percentage of the total costs) and new products developed.	<ul style="list-style-type: none"> • Access to finance • Developing human capital • Adopting new

¹⁵ WITS (wits.worldbank.org)

Upgrading Trajectory	Description	Conditions
Process Upgrading	<p>Developing production processes, reducing waste, and increasing quality and efficiency.</p> <p>Activities include improving inputs, production practices, post-harvest management, improving logistics, and quality standards.</p> <p>Tools include technology applications, training and sustainability certification.</p>	<p>technology and innovation</p> <ul style="list-style-type: none"> • Understanding supply and demand markets • Developing marketing strategies • Infrastructure development • Developing, adopting and enforcing standards and certifications

Source: Ahmed and Hamrick, 2016.

61. Entering higher value-added agricultural value chains requires upgrading, certification and standardization, all of which are examples of innovation. The Global Innovation Index ranks Ecuador 100 out of 128 countries, with particularly weak performance in business sophistication and knowledge outputs. If Ecuador seeks to upgrade into higher value-added markets, improving innovation capabilities will need to be a priority.¹⁶ Changes in consumer demand, technological innovations and changes in production patterns are some of the factors that make agricultural GVCs complex and call for improved traceability and production standards.

62. Ecuador has the necessary elements of a National Quality Infrastructure (NQI) to support the private sector. These include the *Servicio Ecuatoriana de Normalizacion* (INEN) and the *Servicio de Acreditacion Ecuatoriano* (SAE), which offer some services needed by the private sector to conform to international trading partners' standards. INEN serves as the national standards body and national metrology institute, while SAE acts as the national accreditation body. These two institutions serve a market private and public conformity assessment bodies, including certification bodies, inspection bodies, testing laboratories and inspection laboratories. There are almost 400 nationally accredited conformity assessment bodies in Ecuador, including some industry leaders, such as Bureau Veritas and SGS and smaller local players. While Ecuador's local market for conformity assessment can cover basic needs, many gaps still exist. INEN is a member of the major international standard bodies, ISO and IEC, but with 6600 official national standards, INEN is experiencing challenges to meet the demand from the private sector. Furthermore, both INEN and SAE need to adopt a more market-oriented approach to be able to respond to market demands. The recent Industrial Policy stated that Ecuador lacks the NQI to support industries: only 1/3 of products are supported by local quality infrastructure to obtain certifications. The rest of these products must be sent outside of Ecuador to obtain certifications to meet international standards, which increases costs for the firms (MCPEC/MIPRO, 2016). NQI institutions report a limited culture of quality in the private sector. So while firms necessarily require certifications to comply with quality certifications demanded in certain markets, international experience shows the adoption

¹⁶ A deeper analysis of innovation in the priority value chains selected by MIPRO through this NLTA is presented in the complementary report on Innovation (Rubalcaba et al., 2017).

of quality and continuous improvement as a business practice benefits productivity revenues and growth.¹⁷

63. While competitive forces vary from product to product, in many cases, agricultural GVCs are highly concentrated with large multinational firms in North America and Europe dominating the high value added markets, such as agrochemicals, processing and marketing (Ahmed and Hamrick, 2016). This makes it more difficult but even more important for smaller firms and smallholder farmers to work as a cluster, understand supply and demand in their industry and find points of aggregation or consolidation to bring costs down.

64. Diversifying within agriculture, from lower value-added to higher value-added products, is one way to view diversification, versus the idea of diversifying away from agriculture into other sectors such as manufacturing or services. In the same way, transformation of a primary good should not be equated with value addition. In some cases, transformation of a product can in fact destroy value by downgrading to a less competitive product (e.g. selling fresh mangoes vs. producing dried mango – the fresh mango has a much higher margin than the dried mango). However, adding value almost always will entail changes in production practices and innovation, which have as much, or more, to do with strategy and change management as it has to do with cost. The implication of this for Ecuador is the need to reframe how value addition is perceived for agricultural products and to emphasize value addition rather than transformation.

65. Structural transformation refers to the extent to which economic growth is impacted by the expansion or contraction of the most productive sectors. Typically, the weight of agriculture in the economy falls, while that of services increases, while manufacturing's share of employment (and value added) exhibits an inverted U-shaped patterns. As such, it is certain that Ecuador will not achieve economic growth by expansion of the agricultural sector alone. There is indeed a need for productivity gains in all sectors. However, the cluster screening exercise undertaken with MIPRO demonstrates the strength of these clusters and their potential for development. Based on this, it is necessary to understand productivity growth in agriculture as a whole in order to inform policy decisions or institutional arrangements.

66. Furthermore, diversification of national production away from petroleum does not mean that selection of clusters to undergo CRIs should preclude the selection of the petroleum industry. In fact, it would be interesting to undertake a CRI in a petroleum-producing region to see whether there are companies providing industrial maintenance services for the oil and related industries, like plastic, chemical or other related industries. It may be possible to improve the competitiveness of these types of companies, improve their position in specialized and integral services, and potentially identify a strategy to export their services. If an auxiliary industry to petroleum, such as industrial maintenance services, could be developed as a tradable service, then Ecuador could export these services to neighboring countries, or even those further afield.

¹⁷ NQI findings based on an October 2015 World Bank Group mission in Ecuador.

VI. CLUSTER DEVELOPMENT PROGRAMS: RATIONALE, EFFECTS ON PRODUCTIVITY AND INSTITUTIONALIZATION

A. Cluster Development Programs: rationale and effects on productivity

67. The public sector can play a catalytic role in improving firms' upgrading and integration into GVCs. The key rationale for government intervention in the private sector is solving market failures, and in the case of clusters and value chains, these are coordination and information failures. Cluster Development Programs (CDPs) are public interventions that foster the beneficial effects of economies of by creating a set of incentives to overcome coordination failures that hamper the development of some industries in specific locations. These coordination failures could be private-private, private-public and public-public. Types of coordination failures include: poor resource allocation/investment choices, weak inter-firm linkages, inefficient local labor markets, and poor knowledge diffusion and innovation. CDPs are “doomed to choose” sectors, since resources are always scarce and economic agglomerations plenty, at least in terms of where to start in cases where the final goal is to work with all clusters meeting a given definition (Casaburi, 2016). While CDPs take different forms, they typically involve the following activities:

- (a) Mapping and selecting clusters to be supported in the target territory;
- (b) Identification of challenges and needs for policy intervention at the individual cluster level;
- (c) Implementation of actions identified in stage (ii); and,
- (d) Monitoring and evaluation (Casaburi, 2016).

68. CDPs are “designed to improve firms' performance through the strengthening of the firms' network to foster coordination and allow collective actions and the provision of public and club goods” (Alfaro, 2016). As such, CDPs first try to fix coordination failures, after which a change in resource allocation and investment is usually expected.

69. Investments identified through a CDP that can help to solve coordination failures within a cluster could include various public or club goods and services. A Government of Ecuador program may support value chains where the opportunity is highest to promote backward linkages of shared facilities, equipment, and services, with a requirement for counterpart funding (matching grants). Examples of possible needs include: cold chain equipment; logistics centers or services; traceability systems; testing laboratories; design centers; joint design of packaging and labeling appropriate for foreign markets; etc... (World Bank Group, 2015).

70. While significant public resources have been allocated to CDPs, the evidence of the effectiveness of these types of programs has been scarce. However, in recent years, some impact evaluations of CDPs have been undertaken such as Maffioli (2005) who evaluated the PROFO (Proyectos Asociativos de Fomento) program in Chile aimed at fostering networking, cooperation and collective efficiency. The main result of the evaluation was that there were positive effects on productivity. Similarly, in 2010, Falck, Heblich and Kipar evaluated the cluster policy introduced in 1999 in Bavaria, Germany,

aimed at fostering innovation and regional competitiveness by stimulating cooperation between science, business, and finance in five key technology fields. The evaluation found positive effects on the likelihood of becoming an innovator, access to external know-how, cooperation with public scientific institutes and the availability of suitable R&D personnel (Garone, 2016). The impact evaluation of the *Arranjos Productivos Locais* (APL) policy in Brazil (Garrone, 2016) found examples of positive spillover effects which can include the value of total exports and the likelihood of exporting. Figure VI.1 illustrates the effects of CDPs over time. Business performance, including productivity, is shown to be affected last, in the medium to long term. CDPs are designed to improve firms' performance through the strengthening of the firms' network to foster coordination and allow collective actions and the provisions of public and club goods. Therefore, CDPs are not meant to affect firms' performance directly or immediately, but through a series of intermediate effects that eventually lead to efficiency gains. As such, evaluations of CDPs take into account this essential time dimension and can be evaluated by their spillover and intermediate to long-term effects.

Figure VI.1. Effects of Cluster Development Programs (CDPs)

Source: Alfaro, 2016.

Note: Network density is the number of actors (“nodes” in a network); network intensity is the value and relevance of linkages.

71. In complement to the effects noted in Figure VI.1, CDPs also contribute policy recommendations to improve the business climate, including those that are very sector specific to those that have broader economy-wide application, such as labor regulations.

B. Institutionalization of CDPs and examples of other countries’ experiences

72. CDPs are not unknown in Ecuador. There have previously been Competitiveness Improvement Programs (“*Programa de Mejora Competitiva*” [PMC]) in Ecuador, such as those implemented by MIPRO around 2011-2012 and more recently by MAGAP.

73. Various lessons have been gathered from previous CDPs which can be valuable for the implementation of a sustainable CDP in Ecuador. These include: a clear

commitment to cluster policy by the Government; allowing adequate preparation time for institution building; efficient public-public coordination between the CDP and other public programs and policies; adaptation of the cluster development methodology and program design to the level of institutional maturity of the actors; selection of the right executing agency capable of executing locally in selected areas and to manage the local public-private dialogue and ensuring bottom-up development; and adequate funding. In addition to strategic planning for the development of competitiveness of the cluster, CDPs often include co-financing of activities and the establishment of governance structures (Casaburi, 2016). This co-financing is typically for public or club goods and comes in various forms, normally government or donor-funded, or a mix of both. However, for the long-term sustainability of a CDP, it is in the interest of the institution in charge to work towards self-financing mechanisms, as in the Box VI.3 below.

74. An executing agency capable of facilitating the cluster development process and play the role of change agent locally is critical for the success of a CDP. This executing agency would facilitate interaction between the various agents, convince the entrepreneurs or producers to make a change into a new strategic segment where they can be in a better position to compete and identifying local leaders who could be responsible for the execution of the plans to improve the competitiveness of the cluster. In order to act a local facilitator, the executing agency should have knowledge and wide acceptance (credibility) by all parties, as well as an awareness of the latest cluster development methodologies worldwide. It is difficult for an external consulting firm to do this through short, analytical work because while they may be able to undertake good quality strategic analysis, they lack the local knowledge and the acceptance to act as local change agents. The change process resulting from a CRI might be slow and therefore it is crucial that the facilitators are local agents, already embedded in the community, but at the same time independent from the private sector, to avoid being captured by it. Furthermore, in order to execute the long-term vision, the knowledge needs to remain in the field. The best combination would be to build the capacity on the CRI methodology locally to ensure the sustainability of the process. Guidelines for carrying out local Public-Private Dialogue (PPD) are presented in Annex 4.

75. The institutional organization of cluster development support can take various forms. Below are four examples of country experiences of CDPs in Brazil (Box VI.1), Colombia (Box VI.2), Austria (Box VI.3), and Haiti (Box VI.4).

Box VI.1. Brazil Cluster Programs Using the CRI Methodology

SEBRAE, Support Service for Micro and Small Enterprises, is one of the leading organizations for the promotion of economic development in Brazil. Although it was established as an autonomous entity since 1990, SEBRAE had its origins in the 1970s when it consolidated a formal structure to support small and medium enterprises within the Federal Ministry of Planning, after several government efforts in the previous decade. The CEBRAE, as it was called in this early period, grew exponentially, reaching virtually every state in the country two years after its creation.¹⁸ In a country of continental proportions such as Brazil, SEBRAE was divided into autonomous state organizations to increase efficiency in resource allocation.

- **SEBRAE MG**, the autonomous branch responsible for operations in the Brazilian state of Minas Gerais, in 2009 began implementing a new methodology based on CRIs to guide its projects for *Arranjos Productive Locais* (APLs – how the Brazilians referred to clusters and local value chains). The methodology consisted in carrying out different CRIs that aimed at increasing the competitiveness of certain industries in the region. After the pilot implementation of this methodology in 4 sectors (mango, electronics, tourism and furniture), SEBRAE-MG decided it was essential to absorb it within its structure, since they wanted to start implementing on its own.
- **SEBRAE SPO**, in 2009 the branch in the state of Sao Paulo, started a program to support the competitiveness of the companies in 14 APLs, funded by the Inter-American Development Bank (IDB). The sectors included furniture, footwear, apparel, home-textile, dental health, ceramics, plastics, figs and bio-ethanol, amongst others. It was a methodological transfer program to build capacity within the SEBRAE and its local teams spread all over the state's regions.
- An Impact evaluation of cluster policies in Brazil has shown APLs in Minas Gerais and Sao Paolo had positive effects on employment and exports for participating SMEs.

¹⁸ Federal Law no 8.029/90. Available at: <http://www3.dataprev.gov.br/sislex/paginas/42/1990/8029.htm>. Accessed 03/11/2010.

Box VI.2. Rutas Competitivas in Colombia

iNNpulsa Colombia, an entity formed under the Ministry of Industry, Commerce and Tourism in Colombia in 2012, started a CRI Transfer Program in 18 of its regions using the Chambers of Commerce as local change agents since they were very close to the companies and entrepreneurs. The program was carried out over 3 phases in different sectors of agribusiness, industry and tourism, working in 36 cluster initiatives and actively involving SMEs. Today the local teams of the Chambers of Commerce are working autonomously on further Cluster Initiatives and their implementation, maximizing local resources.

Figure VI.2. Structure of Rutas Competitivas in Colombia

Box VI.3. Clusterland Upper Austria

Austria's constitution characterizes the republic as a federation consisting of nine autonomous federal states. The region of Upper Austria is located in central Austria with the Czech Republic to the North and Germany (Bavaria) to the west. With 14% of the area, in 2011 Upper Austria was the fourth largest federal province and the nation's leading state with regards to industry and exports (25% of industrial production and 27% of the nation's exports).¹⁹

Clusters had also been developing in Upper Austria since the late 1990s under the supervision of Austria's location and innovation agency (TMG). In January 2006, the government of Upper Austria decided to create Clusterland Upper Austria, an independent entity to manage six clusters (automotive, plastics, furniture & timber construction, health technology, mechatronics, and environmental technology) and three networks (human resources, design media and network energy) with the objective to be market oriented and work closely with the companies.

Figure VI.3. Clusterland Upper Austria Organization Chart

As Figure VI.3 shows, TMG was the main shareholder of the new legal body, with 61% ownership, with the rest of the shares belonging to the Upper Austrian Chamber of Commerce (19.5%) and the Federation of Austrian Industry (19.5%). The Advisory Board was comprised of 12 members, six of them representing the shareholders and the rest representing five clusters and one network (directly companies). Then each cluster organization has its own advisory board initiated by Clusterland Upper Austria and formed by companies. Each of the 39 employees of Clusterland Upper Austria had specific roles in the organization, besides working in a specific cluster or network.

Clusterland Upper Austria was almost completely publicly financed at the beginning, but the level of self-financing has been increasing every year, with private financing accounting for two thirds of the budget in 2010. In 2011, the public funding was €1.5 million.

¹⁹ Clusterland Upper Austria case, IESE Business School, 2011.

Box VI.4. Haiti Enterprise Support Service (SAE)

In 2014, the Ministry of Trade and Industry (*Ministère du Commerce et de l'Industrie*) created a program to support entrepreneurs across the country. This decentralized service, called the Enterprise Support Service (*Service d'Appui aux Entreprises* - SAE), are present in all ten Departments of the country, and amongst other things, supports entrepreneurs to become more productive and competitive through the development of value chains. The SAE teams work in their Departments to develop public-private dialogue. In particular, they work in partnership with other key partners such as the Chambers of Commerce, Departmental offices of the Ministry of Economy and Finance, Ministry of Planning and External Cooperation, etc.

A World Bank Group grant (“Business Development and Investment Project”) and a Competitive Industries and Innovation Program (CIIP) grant for Haiti are helping build the capacity of the new SAE teams through training, coaching, and other technical assistance. In order to carry out value chain initiatives, the CIIP program has financed a training program on the CRI methodology to SAE teams, as well as other Government ministries and Chambers of Commerce, on the methodology for carrying out such initiatives. The CIIP grant also financed coaching for each team. From 2014-2016, the SAE teams have been working with over 600 micro and small entrepreneurs in the following sectors: coffee, cocoa, mango, avocado, honey, apparel and vetiver (Figure VI.4).

Figure VI.4. Micro and Small Entrepreneurs in Haiti's CRIs

VII. CONCLUSIONS AND RECOMMENDATIONS

76. The upgrading of Ecuadorian firms into high value added market segments is an important aspect of transforming the productive matrix in Ecuador. This NLTA put forward a cluster development approach to improving firms' performance in the medium to long term, with more immediate improvements in coordination, linkages, and resource allocation and investment in the shorter term. The technical assistance provided to MIPRO was limited to the transfer of a cluster screening methodology, which resulted in the selection of twelve clusters, namely: textiles and confection; furniture and wood products; cocoa; coffee, fish; palm; meat products; dairy products; fresh fruit; fresh vegetables; canned fruit and vegetable; and banana and plantain. However, this report goes further in providing an overview of the initial strategic analysis tools used in the CRI methodology, including strategic segmentation, segment analysis, Five Forces analysis, and Sector-Specific Public-Private Dialogue. These tools allow for a deeper understanding of the competitive forces within different market segments and demonstrate the importance of local information and analytics in understanding cluster competitiveness. Given the inability to thoroughly collect local information in this NLTA, the report applies these tools at a national level for four industries: coffee, cocoa, fish and wood products.

77. One advantage of the five forces analysis is that it permits targeting of specific groups of firms or entrepreneurs by placing them in the middle of the Five Forces and the competitive forces specific to their current situation. This type of analysis has been done in a World Bank Group-financed project in Haiti, where micro enterprises and smallholder farmers were the target beneficiaries and the strategic analysis proposed global value chains where they could best compete and increase their value added in the production process. In the case of the clusters identified through this technical assistance, a key question for future interventions would be to determine who the target beneficiaries are. If poverty reduction and improving the situation for the bottom 40 is a priority, then this could be factored into the selection of clusters. As we can see from the cluster mapping, there are coffee clusters in Manabí, Loja and El Oro. However, the types of "firms" are different. Manabí, where the coffee exporting association ANECAFE is based, has larger firms producing lower altitude Arabica coffee. Loja has a higher concentration of poverty than Manabí, for example, and the coffee producers are more likely poorer in Loja than in Manabí. So targeting a CRI in Loja could have more returns for the Bottom 40, than Manabí.

78. The selection criteria selected during this NLTA led to the dominance of agroindustry in the final selection of sectors. This points to the competitive advantages Ecuador has in agricultural products, but moving to higher value-added agroindustry products will require the use of specialized services, many of which are not available in Ecuador. CRIs can help inform the types of specialized services needed, such as consulting, logistical, traceability, software or standards/certification.

79. The linkage between CDPs and productivity are discussed in Section 7.1, where evaluations of CDPs have shown the effects of CDPs over time, with corrections to coordination failures in the short term and a progression to improvement in business performance in the longer term. Finally, the paper discusses the importance of institutionalization of CDPs and the importance of strong local presence to gather local data and undertaken analyses. This "local" factor is the main difference between CDPs and studies, like the Bain Report, whose analysis remains at the national level. The local

analysis in a CDP helps to identify the actions which are needed locally and then there are the policies that need to be adapted or created which would be dealt with at the national level.

80. Finally, if a government wants to pursue CDPs, they require the adequate institutional arrangements to support these policies and programs. This paper provides four examples of CDPs in Brazil, Colombia, Austria and Haiti. These experiences highlight the diversity of experiences and the range of possible institutional options.

81. This paper concludes with the following recommendations for MIPRO:

- (a) **Future value chain studies in Ecuador should include in their analysis how value is distributed along the value chain and how to help increase the value-added of smaller firms and/or smallholder farmers.** This would allow a greater focus on poverty reduction by identifying what support (goods or service) smaller firms need to gain more value in the value chain. For example, would proposed investments benefit a few large firms or a greater number of poorer, smallholder farmers?
- (b) **Given Ecuador's natural competitive advantage in agriculture, diversification should not focus on switching to other non-agricultural sectors, but rather upgrading into higher-value added agricultural value chains.** However, these higher-value added agricultural value chains are more complex, as such agribusiness firms will require more specialized services such as improved National Quality Infrastructure and specialized logistics services (e.g. cold chain), to name a few. Strengthening the capacity of the country's NQI institutions - INEN and SAE - and filling several gaps in the NQI would be necessary to provide the services needed by the private sector to export products.
- (c) **It is recommended to undertake an assessment or Public Expenditure review of competitiveness improvement and other industry-supporting programs that have been implemented in Ecuador over the past years.** Such a review would allow the Government of Ecuador to consider the effectiveness and outcomes of these programs to date. Furthermore, the findings could also be used as inputs to improve the design of future competitiveness improvement programs, in terms of their cost-effectiveness, design and sustainability.
- (d) **Cluster Development Programs can help firms become more innovative, increase the likelihood of exporting and improve productivity over time.** By enhancing coordination and linkages, CDPs can impact resource allocation and investments, business practices and technologies and finally business performance of firms. However, as recent case studies and evaluation of CDPs have shown there are some factors that can ensure a greater chance of success, including: a clear commitment to cluster policy by the Government; allowing adequate preparation time for institution building; efficient public-public coordination between the CDP and other public programs and policies; adaptation of the cluster development methodology and program design to the level of institutional maturity of the actors; selection of the right executing agency capable of executing locally in selected areas and to manage the local public-private dialogue and ensuring bottom-up development; and adequate funding. In addition

to strategic planning for the development of competitiveness of the cluster, CDPs often include co-financing of activities and the establishment of governance structures.

- (e) **The Government of Ecuador could support CDPs in selected regions but should apply lessons learned from past CDP experiences in other countries to ensure success of the program.** Recent case studies and evaluations have shown that in order for CDPs to be successful and sustainable, they require the right design (both in terms of structure and governance), and adequate time for institution building and program preparation. Public-public collaboration is also a critical success factor, and in the case of the value chains identified in this report, collaboration between MAGAP and MIPRO is fundamental for the success of any agribusiness CDP and collaboration with ProEcuador is also important in terms of market linkages and export promotion. Furthermore, they should focus on solving coordination failures within a cluster, and if possible, have funds available to co-finance public or club goods and services. A Government of Ecuador program may support value chains where the opportunity is highest to promote backward linkages of shared facilities, equipment, and services, with a requirement for counterpart funding (matching grants). Examples of possible needs include: cold chain equipment; logistics centers or services; traceability systems; testing laboratories; design centers; joint design of packaging and labeling appropriate for foreign markets; etc. In the short-term, it would be interesting for MIPRO to explore how existing programs, such as *Encadena*, could adopt some of the methodologies and lessons learned presented in this paper.

Annex A. Workshop participants

Name	Title	Institution	Subsecretary	Feb 23-24	June 7-8	Sept 22-23
Carlos Diaz	Director	MIPRO	SMEs and Artisans			✓
Carmen Tiban	Specialist	MIPRO		✓	✓	
Cristina Zambrano	Specialist	MIPRO	Agroindustry and Processed Aquaculture	✓		✓
Danilo Valencia	Technician	MIPRO	“Encadena” Project			✓
Dennis Zurita	Subsecretary	MIPRO	Services	✓	✓	
Edison Yamchapaxi	Director	MCPEC			✓	
Fabian Galindo	Analyst	MIPRO				✓
Fernanda Niemes	Director	MIPRO	Services and Industrial Logistics	✓	✓	✓
Fernando Fuertes	Director	MIPRO				✓
Francisco Bolaños	Cabinet advisor	MIPRO		✓	✓	
Gabriel Astudillo	Director	MIPRO	Agroindustry and Processed Aquaculture			✓
German Flores	SME Specialist	MIPRO	SMEs and Artisans	✓	✓	
Gina Lopez	Director	MIPRO	Agroindustry and Processed Aquaculture	✓	✓	
Ivette Sanchez	Technician	MIPRO		✓		✓
Johana Bravo	Analyst	MIPRO		✓		
Juan Carlos Sanchez	Analyst	MIPRO	Industries and linkages	✓		✓
Pablo Rea	Specialist		Industries and linkages	✓		✓
Paola Ramon	Subsecretary	MIPRO	Agroindustry and Processed Aquaculture	✓		
Pedro Luna	Analyst	MIPRO		✓		
Roberto Estevez	Director	MIPRO	SMEs and Artisans			✓

Annex B. Cluster screening methodology

B.1. Methodology

82. Selecting clusters is a precursor to any Cluster Development Program (CDP). The cluster screening methodology presented in this report was developed by The Competitiveness Group, Inc.. This methodology is rooted in business strategy and cluster change management, which are both equally important when undertaking a cluster competitive reinforcement initiative. The methodology for strategic analysis is based on the concepts developed by Michael E. Porter in his various publications on competitiveness.

83. The cluster screening methodology consists of 5 steps: (1) identification of companies in the region, (2) definition of businesses in the region, (3) criteria for cluster definition, (4) criteria for cluster selection, and (5) preliminary strategic analysis. This methodology is presented below in Figure B.1:

Figure B.1. Cluster Screening Methodology Flow Chart

Source: Competitiveness (www.competitiveness.com).

84. Below is a step by step presentation of implementation of the methodology by MIPRO.

(a) Step 1: identification of companies in the region

- (i) **In step 1, the MIPRO team reviewed the work done previously in the ATPT which identified businesses in each of the 24 provinces, which were divided into 7 zones.** Initially, 252 businesses were identified, although there were some inconsistencies between industry segmentation across regions. For example, in Zone 1, coffee was segmented into Arabica coffee, Robusta coffee, organic Arabica coffee with origin label (zone 1), while other zones only presented

Processed and decaffeinated coffee (zone 4) or simply coffee (zone 7). While the methodology calls for the deployment of teams to gather information on companies through interviews (e.g. name of company, number of employees, annual sales and description of business activity), given the limitations of this Technical Assistance, the MIPRO team instead used the ATPT to identify the businesses in their assigned zones.

(b) Steps 2 and 3: Definition of the businesses in the region and Criteria for cluster definition

- (i) **The second and third steps called for the definition of a “business” and a “cluster.”** To define a business, one must ensure there is a clear and common business, a sufficient critical mass of companies to ensure the presence of a large enough cluster, geographic concentration, a certain level of complexity in the value chain, and the presence of support institutions. To illustrate what is meant by “business”, we can ask ourselves if a metal-mechanics company is in the auto manufacturing business, the petroleum business or the metal-mechanics business? To answer this question, normally one would visit the firms to confirm what business they are in. A cluster of firms requires, inter alia, a clear and common business among the companies and a minimum critical mass of firms within geographic proximity. In this exercise, it was agreed with MIPRO that a critical mass would be defined as at least 20 companies in the same geographic area. Furthermore, companies must exist in order to identify an industry. A newer industry, such as nanotechnology, where few companies exist, would not meet the minimum criteria for inclusion in the cluster screening. This does not preclude that companies in adjacent or similar industries cannot make a move into a new product or industry, but this must be the result of a completed CRI.
- (ii) **During step two of the methodology, MIPRO was also finalizing its Industrial Policy, which was published in August 2016.** The Industrial Policy prioritized 16 industries in the areas of (i) agroindustry, (ii) intermediate and final industries, (iii) services and (iv) basic industries. These 16 industries are: (i) coffee derivatives, cocoa derivatives, fish and seafood products, palm, fruits and vegetables, dairy products, bioenergy; (ii) metal-mechanics, textiles, medicine for human consumption, furniture and wood products; (iii) ship making, pulp, flat steel; (iv) KIBS (software and IT services, consulting, quality and training), and logistics and transport. In order to align with the Industrial Policy, it was agreed to base the identification of clusters on the 12 industries included in the Industrial Policy, rather than the business identified in the ATPT. However, given that the Industrial Policy is based on the Transformation of the Productive Matrix, the industries did not

deviate greatly from industries previously considered.

(c) Step 4 Criteria to select clusters

- (i) **In the next step of defining the criteria for cluster selection, the MIPRO team decided to use exports and employment as their quantitative criteria and level of innovation as their qualitative criteria.** Based on the criteria selected by MIPRO, the following 12 industries were selected: Textile and apparel; furniture and wood products; cocoa; coffee; fish; palm; meat products; dairy; fresh fruit; Fresh vegetables; conserved fruit and vegetable; and banana and plantain. In the process of identifying the businesses, it was some industries were excluded for the reasons cited in section 2.

(d) Step 5: Preliminary Strategic Analysis

- (i) **Section 4 of this report presents a preliminary strategic analysis for 4 of the 12 identified sectors, namely: coffee, cocoa, fish, and wood products.** The preliminary strategic analysis includes strategic segmentation, segment analysis, Five Forces analysis and a presentation of value chains for some strategic segments, to exemplify the first steps in analyzing cluster competitiveness, as would be done in a CRI. This analysis on the selected pilot sectors aims to demonstrate the utility of the strategic analysis tools, which could be replicated by the Government.

Annex C. Competitive Reinforcement Initiative methodology

C.1. Methodology

85. The Competitive Reinforcement Initiative (CRI) is a methodology that combines strategic analysis with activities involving the participation of cluster agents to promote a change process. The methodology used for the strategic analysis is based on the concepts developed by Professor Michael E. Porter, Harvard University, in his books “Competitive Strategy” (1980), “Competitive Advantage” (1985), “The Competitive Advantage of Nations” (1990) and “On Competition” (1998). The *Five Forces* and the *Value Chain* are frameworks commonly used in the analysis. The CRI methodology, was adopted by the European Foundation for Cluster Excellence as a field project methodology, to apply learnings of the training program for professionals of economic development.

86. The objective of a CRI is to foster change and involve firms and institutions towards common goals and solutions. For this strategic change to happen, besides the strategic analysis, particular attention is paid to the change management process. This is done through a strong effort to communicate and a pedagogical attitude towards change. A broad set of tools is deployed like personal interviews, workgroups, and public presentations.

C.2. Strategic segmentation

87. The Strategic Segmentation of a particular industry seeks to answer the following two questions:

- (a) What are the different “businesses” that exist in the industry?
- (b) What will the industry consist of “tomorrow”? By looking at the trends and in which direction the industry is heading.

88. As can be seen in Table VII.1, the Matrix of Strategic Segmentation contains all the strategic segments of an industry. The strategic segmentation provides a global overview of the different businesses that exist in a particular sector, and is not country specific.

Table VII.1. Matrix of Strategic Segmentation

		users / markets		
		?	?	?
products / services	?	Strategic Segment 1	Strategic Segment 2	Strategic Segment 3
	?	Strategic Segment 4	Strategic Segment 5	Strategic Segment 6
	?	Strategic Segment 7	Strategic Segment 8	Strategic Segment 9

89. Each strategic segment is a function of both the product and/or service and the user or market group that this product/service serves. The strategic segments are distinct from one another because the Porter's Five Forces²⁰ are different; therefore, the value chain of each segment is also different. As such within a sector, each strategic segment will have its own value chain (Figure C.1).

Figure C.1. Strategic Segments and their Value Chains

Source: PPD for Sector Competitiveness (2013).

C.3. Segment Analysis

90. Once the different strategic segments are identified in the matrix, each needs to be analyzed. This analysis fosters to answer the two following questions:

- (a) What would it take for any country/region to compete in this segment that has been identified?
- (b) What does our country/region (the one we are analyzing) have? What doesn't it have? What policy needs to change? What investments need to be made?

91. In order to answer these questions, different strategic tools will be used. For each strategic segment it is necessary to identify the value chain required at a global level, not country-specific. Porter's Five Forces and the challenges and opportunities for development in the region/country that we are analyzing are important in this analysis. Below there is the explanation of these tools.

92. In order to understand the business identified in each strategic segment, one needs to draw and explain the value chain required. This means to identify each one of the activities performed along the value chain and understand each need of resource intensity and linkage, following the typologies shown at in Figure C.2.

²⁰ Porter's Five Forces Analysis is a very useful tool for business strategists. It is based on the observation that profit margins vary between industries, which can be explained by the structure of an industry – "Note on the Structural Analysis of Industries" (Michael E. Porter, 1980)

Figure C.2. Value Chain Activities and Linkages Typologies

Source: Emiliano Duch, World Bank Group.

93. Through Porter's Five Forces framework, it is possible to assess the attractiveness of each strategic segment in a given industry by analyzing how profitable the segment is, and which actors have the most bargaining power and therefore which actors retain the bulk of said profit. Michael Porter posited in 1979 that "the state of competition in an industry depends on five basic forces" (Figure C.3). The profitability of the segment depends basically on three of them: the threat of new entrants, the threat of substitute products or services; and jockeying for position among current competitors (i.e. the three forces on the y axis). The question of who is retains the margin depends on the other two forces: the bargaining power of suppliers and the bargaining power of customers (i.e. the two forces on each end of the x axis). The combination of the forces will make the segment more or less attractive.

Figure C.3. Porter's Five Forces

Source: Porter, 1979. Harvard Business Review.

94. The last part to be considered of each strategic segment is to identify the challenges and opportunities for development in the region or country that is being considered. It means comparing the “ideal value chain” identified with the “real value chain” in that region / country. The comparison will identify which activities of the value chain are missing, and thus are the areas of improvement that this region / country should work on in order to compete in that strategic segment. This will then be translated into actions, policies to change or make and investments to be made.

Annex D. Guidelines for local Sector-specific Public-Private Dialogue Practitioners

PRINCIPLES	PHASE			
	BIRTH	DEVELOPMENT	MATURITY	TRANSFORMATION
CHAMPIONS	<ul style="list-style-type: none"> • Avoid traditional sector leaders • Do not endorse yet any champion 	<ul style="list-style-type: none"> • Support the possible champion aligned with future strategy 	<ul style="list-style-type: none"> • Do not let the professionals become the future champion. • Formally recognize the champion 	<ul style="list-style-type: none"> • Establish formal processes to transition to new champions
FACILITATORS (CHANGE AGENTS)	<ul style="list-style-type: none"> • Neutral, not depending from private sector (PrS) • Local presence to follow PPD 	<ul style="list-style-type: none"> • Strategic and change skills • Local and global capabilities (English and travel skills) 	<ul style="list-style-type: none"> • Limit to coaching the PPD • Engage and supervise project managers for specific actions 	<ul style="list-style-type: none"> • Every 3-5 years review strategy • Search for more appropriate champions to new strategy
SECTOR SCOPE	<ul style="list-style-type: none"> • Do not define scope beforehand • Screen for distinct businesses 	<ul style="list-style-type: none"> • Identify new strategic segments • Design new shared value system 	<ul style="list-style-type: none"> • Extend actions to other sectors • Identify implications for policy 	<ul style="list-style-type: none"> • Redefine the business scope every 3-5 years
INTERNATIONAL REFERENCES	<ul style="list-style-type: none"> • Do not use international references yet (avoid imitation) 	<ul style="list-style-type: none"> • Visit Advanced Buyers of new segments abroad and locally • Benchmark Value Chain activities 	<ul style="list-style-type: none"> • Monitor competitors • Collaborate with experts on new activities, not with similar SPPD 	<ul style="list-style-type: none"> • Visit again Advanced Buyers abroad and locally • Benchmark new value chain
OUTPUTS	<ul style="list-style-type: none"> • Internal "kick off meeting" of PuS stakeholders and Kick Off document 	<ul style="list-style-type: none"> • Shared new strategic segment • Action lines to build capabilities 	<ul style="list-style-type: none"> • Execution of action lines to support new strategy • Keep quick wins as well 	<ul style="list-style-type: none"> • Redefinition of Strategic Segments • Redefinition of Action Lines
OUTREACH & COMMUNICATION	<ul style="list-style-type: none"> • Reach only "friendly" PrS to test • No communications at this stage 	<ul style="list-style-type: none"> • Inform one by one 20-30 PrS • Invite all PrS to 3 Public meetings • No press yet 	<ul style="list-style-type: none"> • Launch communication once first action starts • Publicize actions not structures 	<ul style="list-style-type: none"> • Do not promote the old champion • Publish success stories abroad to promote change of leadership
STRUCTURE & PARTICIPATION	<ul style="list-style-type: none"> • No structure at this stage • Participation on one to one basis 	<ul style="list-style-type: none"> • Facilitator runs structure • Participation open to all PrS 	<ul style="list-style-type: none"> • Open participation in projects • Structure to only follow regional and local projects 	<ul style="list-style-type: none"> • Facilitate transformation by keeping all regional PPD structures under one single legal entity
MANDATE & INSTITUTIONAL ALIGNMENT	<ul style="list-style-type: none"> • Agreement at top level PuS to go • Understanding of risks by PuS 	<ul style="list-style-type: none"> • Formal briefings with key PuS • Both sides compromise in public by co-presenting actions 	<ul style="list-style-type: none"> • Yearly "Horizontal policy" seminars with all PuS to align policies 	<ul style="list-style-type: none"> • Establish formal transformation process based in strategic reviews at 3-5 years
SUBNATIONAL & LOCAL	<ul style="list-style-type: none"> • Redefine initiative perimeter in function of local socio-economy 	<ul style="list-style-type: none"> • Involve regional and local levels of government and institutions 	<ul style="list-style-type: none"> • Coordinate and integrate national and federal support actions. • Bottom-up policy making 	<ul style="list-style-type: none"> • Go back to the local level to redefine strategies
CONFLICT RESOLUTION	<ul style="list-style-type: none"> • Consider weight of preexisting conflicts and counterbalance 	<ul style="list-style-type: none"> • Identify conflicts on one by one • Use first Public Meeting to vent • Focus to new goal in second one 	<ul style="list-style-type: none"> • Isolate projects from new conflicts • Avoid constant rethinking of goals • Limit broad meetings (2 x year) 	<ul style="list-style-type: none"> • Provoke crisis by questioning existing models formally (seminars with foreign experts)
ROLE OF DEV. PARTNERS	<ul style="list-style-type: none"> • Act as guarantors of the neutrality of the process 	<ul style="list-style-type: none"> • Pay for the neutral facilitators in the development process 	<ul style="list-style-type: none"> • Finance and support actions • Do not support structures 	<ul style="list-style-type: none"> • Organize international exchanges to facilitate the renewal
MONITORING & EVALUATION	<ul style="list-style-type: none"> • Establish milestones and go/no go for Development Phase 	<ul style="list-style-type: none"> • Establish M&E for each proposed action, not for the PPD • Control go/no go milestones 	<ul style="list-style-type: none"> • Monitor project implementation, discontinuing if needed 	<ul style="list-style-type: none"> • Evaluate the competitive position as a measure of need for renewal

Source: Cluster Competitiveness Group, S.A. “Public-Private Dialogue for Sector Competitiveness and Local Economic Development: Lessons from the Mediterranean Region”, produced for the Public Private Dialogue program of the Investment Climate Department of the World Bank Group, and funded through the Catalonia (COPCA) / IFC Technical Assistance Trust Fund.

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