

Integrated Value Chain Analysis for Coffee Production in Indonesia

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Prepared by



Global Development Solutions, LLC

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DRAFT 1

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1.0 Summary of Findings

1.1 Barriers to Competitiveness

The matrix below provides a summary of key findings that impede the competitiveness of the Arabica coffee sector in Indonesia.

Key Issues Inhibiting the Competitiveness of the Arabica Coffee Sector in Indonesia

Issues		Public	Private
Market	• Absence of a targeted strategy to promote premium Arabica coffee in the international market	X	X
	• Lack of understanding among public and private sector stakeholders regarding key market drivers in the Arabica coffee market	X	X
	• Low yield rates as a result of little or no tree husbandry		X
	• Limited re-investment in replacing mature tree stock	X	X
	• Ad hoc use of fertilizers	X	X
	• Use of poor pulping equipment resulting in damaged parchment		X
	• Limited storage facilities at the village collector level		X
	• Lack of investment in mechanical sorting equipment	X	X
	• High inland transport costs		X
Governance	• Absence of a tree re-planting program	X	X
	• Absence of an industry-wide strategic vision	X	X
	• Lack of clarity regarding how the coffee levy is supporting the industry	X	
	• Coffee grading structure which is not in alignment with international standards	X	X
	• High port charges, specifically terminal handling charges	X	
	• High export certification and documentation costs	X	
Institutional	• Lack of institutional representation to organize smallholder coffee farmers	X	X
	• Absence of extension service	X	X
	• Little or no R&D focused on variety development	X	
	• Inability of AEKI to represent and promote coffee exports	X	X
	• Absence of a transparent and efficient supply chain structure between farmers and processors/traders		X
	• No access to finance for market intermediaries along the supply chain	X	X
	• Absence of centralized mechanical pulping service	X	X
	• Lack of understanding and information regarding tree husbandry	X	X
Human Resource	• Absence of technical skills and capacity to deliver integrated pest management services	X	X
	• Lack of knowledge and understanding regarding integrated pest management	X	X
	• Limited understanding of variety selection and how to manage product quality	X	X
	• No investment and little know-how about the use of sprays to control pest and disease damage	X	X
	• Low labor productivity with regards to manual sorting skills	X	X

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1.2 Sector Profile

The total coffee production area in Indonesia reached over 1.3 million hectares in 2005, yielding 674,850 tons of coffee. With respect to output, Robusta coffee (93%) dominates coffee production in Indonesia with over 1.19 million hectares and 627,821 tons of production (refer to Table XXX).

Coffee Production in Indonesia (2005)				
	Total Area (ha)	Total Area (%)	Production (tons)	Average Yield Rate (tons/ha)
Sumatra	820,486	18.5%	487,118	0.594
Java	161,246	12.9%	66,750	0.414
Nusa Tenggara	113,280	14.5%	39,686	0.350
Kalimantan	47,309	0.0%	15,524	0.328
Sulawesi	140,505	54.1%	61,806	0.440
Maluku & Papua	19,217	0.0%	3,966	0.206
Total	1,302,043	100.0%	674,850	
Average Yield Rate (tons/ha)				0.518

Robusta Coffee Production in Indonesia (2005)				
	Total Area (ha)	Total Area (%)	Production (tons)	Average Yield Rate (tons/ha)
Sumatra	801,515	18.5%	472,345	0.589
Java	141,563	12.9%	59,881	0.423
Nusa Tenggara	98,839	14.5%	34,473	0.349
Kalimantan	47,309	0.0%	15,524	0.328
Sulawesi	83,114	54.1%	41,632	0.501
Maluku & Papua	19,217	0.0%	3,966	0.206
Total	1,191,557	100.0%	627,821	
Average Yield Rate (tons/ha)				0.527

Arabica Production in Indonesia (2005)				
	Total Area (ha)	Total Area (%)	Production (tons)	Average Yield Rate (tons/ha)
Sumatra	18,971	18.5%	14,774	0.779
Java	19,683	12.9%	6,869	0.349
Nusa Tenggara	14,441	14.5%	5,213	0.361
Kalimantan	-	0.0%	-	na
Sulawesi	57,391	54.1%	20,174	0.352
Maluku & Papua	-	0.0%	-	na
Total	110,486	100.0%	47,030	
Average Yield Rate (tons/ha)				0.426

Source: Compiled by Global Development Solutions, LLC based on data from Departemen Pertanian, Direktorat Jenderal Perkebunan, 2006

For both Arabica and Robusta, production of coffee is dominated by smallholder farmers, where the average size of a farm ranges from 1.0 – 1.5 hectares. The coffee sector generates direct employment for over 2 million farmers, but yield rates continue to remain low for both Arabica (752 – 1,031 kg/ha) and Robusta (424 – 636 kg/ha).

Coffee Sector Profile for Indonesia

1.0 Area Under Cultivation (ha)	1,307,043			
Arabica (2005)	Smallholder	Gov't	Private	Total
1.1 Total hectares planted	99,499	6,672	4,315	110,486
1.2 Total hectares mature trees	54,424	5,751	1,592	61,767
1.3 Total production (ton)	40,931	4,458	1,641	47,030
1.4 Average yield/ha (kg)	752	775	1,031	761
1.5 Number of farmers	224,414			
1.6 Average output/farmer (kg)	239			
Robusta (2005)	Smallholder	Gov't	Private	Total
1.6 Total hectares planted	1,150,056	19,925	21,576	1,191,557
1.7 Total hectares mature trees	877,399	18,678	15,468	911,545
1.8 Total production (ton)	606,123	12,549	9,149	627,821
1.9 Average yield/ha (kg)	527	639	424	527
1.10 Number of farmers	1,824,628			
1.11 Average output/farmer (kg)	334			
2.0 Total number of farmers	2,049,042			
3.0 Total production – 2005 (ton)	674,850			
4.0 Average farm size	1.0 – 1.5 ha			
5.0 Coffee Exports (2004)	Ton	Value (\$)	Average value (\$/ton)	
5.1 Arabica	25,570	\$32,968,000	\$1,289	
5.2 Robusta	305,168	\$241,187,000	\$790	
5.3 Roasted coffee (excl. decaf)	806	\$1,677,000	\$2,081	
5.4 Roasted coffee (decaf powder)	680	\$1,108,000	\$1,629	
6.0 Key Export Destinations	Arabica		Robusta	
6.1% of total exports in volume	USA (37.3%) Germany (16.9%) Japan (11.6%)		USA (20.2%) Japan (16.6%) Germany (15.7%)	
7.0 Primary Processing	Wet process: average bean size (5.5 mm) Dry process: average bean size (3.0 mm)			
8.0 Coffee Marketing Channel	Brokerage system			
9.0 Research Facility	Indonesia Research Institute for Coffee and Cocoa (IRICC)			
10.0 Coffee Varieties	Bergendal, Sidikalang, S288, S795, USDA726, Rambung/ Abyssinia, Tim Tim, Ateng, Catimor, Caturra, Kartika 1 & 2 (35 varieties)			
11.0 Growing Condition				
11.1 Altitude range	1,000 – 1,500 meter			
11.2 Shade	30% – 50% under shade farming (shade tree: dap dap tree, kayu embun, lamtoro plant, citrus)			
12.0 Bean Count	Extra large beans (ELB): 450 beans/100g Average bean count: 700 beans/100g			
13.0 Export Grading System				
Defect-based system defined by number of defective beans per 300g	Grade 1: <11 defects Grade 2: 12 to 25 defects Grade 3: 26 to 44 defects Grade 4a: 45 to 60 defects Grade 4b: 61 to 80 defects Grade 5: 81 to 150 defects Grade 6: 151 to 225 defects			

Compiled by Global Development Solutions, LLC

In 2004, approximately 25,570 tons of Arabica coffee valued at \$32.9 million was exported from Indonesia. Similarly, 305,168 tons of Robusta coffee valued at \$241.2 million was exported.

In 2006, Indonesia exported approximately 283,960 tons of Robusta, down from the previous year when it exported 331,788 tons, making it the second largest exporter of Robusta coffee in the world behind Vietnam (refer to the table below). While Indonesia is the second largest exporter of Robusta coffee in the world, it is well behind Vietnam which dominates the Robusta coffee market with over 45% of the world market share. As noted in the figures below, India is slowly gaining prominence in the Robusta market, moving from the number six position with 5.79% of the market share in 2005, to the number 4 position with 8.12% market share.

Robusta Coffee Exports by Country (2006)			Robusta (2005)		
Country	Tons	% of Total	Country	Tons	% of Total
Vietnam	787,370	45.74%	Vietnam	839,646	46.37%
Indonesia	283,960	16.49%	Indonesia	331,788	18.32%
Brazil	149,771	8.70%	Brazil	162,016	8.95%
India	139,871	8.12%	Uganda	119,025	6.57%
Côte d'Ivoire	125,051	7.26%	Côte d'Ivoire	117,494	6.49%
Uganda	85,157	4.95%	India	104,884	5.79%
Cameroon	34,230	1.99%	Cameroon	33,227	1.83%
Thailand	33,517	1.95%	Ecuador	32,538	1.80%
Ecuador	30,591	1.78%	Thailand	20,526	1.13%
Guinea	16,860	0.98%	Tanzania	13,293	0.73%
Tanzania	12,118	0.70%	Guinea	11,716	0.65%
Togo	6,745	0.39%	Togo	8,975	0.50%
Madagascar	5,460	0.32%	Congo, Dem. Rep. of	5,463	0.30%
Congo, Dem. Rep. of	3,778	0.22%	Madagascar	3,910	0.22%
Central African Republic	2,640	0.15%	Central African Republic	2,503	0.14%
Philippines	2,200	0.13%	Philippines	2,170	0.12%
Ghana	720	0.04%	Ghana	520	0.03%
Sierra Leone	720	0.04%	Sierra Leone	428	0.02%
Angola	343	0.02%	Angola	299	0.02%
Papua New Guinea	235	0.01%	Papua New Guinea	173	0.01%
Nigeria	120	0.01%	Nigeria	101	0.01%
Sri Lanka	60	0.00%	Sri Lanka	93	0.01%
Gabon	23	0.00%	Trinidad and Tobago	0	0.00%
Trinidad and Tobago	-	0.00%	Gabon	-	0.00%
TOTAL	1,721,541	100%	TOTAL	1,810,789	100%

Note: October - September 2005 and 2006

Source: International Coffee Organization

Indonesia's Arabica coffee exports has not enjoyed the same prominence in the world market as the Robusta coffee. In 2006, Indonesia exported only 68,517 tons, which ranks them 12th in the world market with a market share of 1.95% (refer to the table below). In the highly competitive Arabica coffee market, Brazil (38.9%) and Columbia (18.3%) hold a strong position in the world market.

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Arabica Coffee Exports by Country (2005 & 2006)					
Arabica Coffee Exports by Country (2006)			Arabica (2005)		
	Tons	% of Total		Tons	% of Total
Brazil	1,367,108	38.94%	Brazil	1,477,541	41.47%
Colombia	644,131	18.35%	Colombia	660,271	18.53%
Guatemala	200,892	5.72%	Guatemala	207,442	5.82%
Peru	177,861	5.07%	Peru	175,292	4.92%
Honduras	175,714	5.00%	Ethiopia	157,197	4.41%
Ethiopia	160,488	4.57%	Honduras	143,714	4.03%
Mexico	150,460	4.29%	Mexico	114,441	3.21%
Nicaragua	85,622	2.44%	Costa Rica	90,590	2.54%
El Salvador	76,115	2.17%	El Salvador	78,718	2.21%
Costa Rica	74,781	2.13%	Papua New Guinea	67,012	1.88%
India	71,962	2.05%	Nicaragua	60,907	1.71%
Indonesia	68,517	1.95%	India	57,725	1.62%
Papua New Guinea	59,382	1.69%	Indonesia	55,515	1.56%
Kenya	38,564	1.10%	Kenya	39,525	1.11%
Uganda	34,961	1.00%	Tanzania	31,546	0.89%
Tanzania	27,301	0.78%	Uganda	30,304	0.85%
Ecuador	26,074	0.74%	Burundi	29,427	0.83%
Rwanda	17,580	0.50%	Ecuador	24,675	0.69%
Dominican Republic	7,566	0.22%	Rwanda	15,441	0.43%
Burundi	6,542	0.19%	Zambia	6,351	0.18%
Venezuela	6,480	0.18%	Cameroon	6,276	0.18%
Zambia	5,756	0.16%	Venezuela	6,083	0.17%
Cameroon	5,310	0.15%	Bolivia	4,958	0.14%
Panama	4,948	0.14%	Panama	4,883	0.14%
Congo, Dem. Rep. of	3,842	0.11%	Congo, Dem. Rep. of	4,670	0.13%
Bolivia	3,780	0.11%	Zimbabwe	3,538	0.10%
Zimbabwe	3,420	0.10%	Dominican Republic	2,464	0.07%
Paraguay	1,342	0.04%	Cuba	2,051	0.06%
Haiti	1,320	0.04%	Paraguay	1,258	0.04%
Jamaica	1,204	0.03%	Jamaica	1,257	0.04%
Malawi	1,032	0.03%	Malawi	1,089	0.03%
Cuba	902	0.03%	Haiti	629	0.02%
TOTAL	3,510,956	100%	TOTAL	3,562,790	100%

Note: October - September 2005 and 2006

Source: International Coffee Organization

The United States, Japan and Germany are the primary export destinations for both Arabica and Robusta coffee from Indonesia. Specifically, the United States is the largest importer of both Arabica \$32.5 million (37.3%) and Robusta \$19.4 million (20.2%) from Indonesia.

Total Value and Volume of Indonesia Coffee Exports by Destination (2004)

Arabica	Tons		Value (\$)	
	2003	2004	2003	2004
USA	17,462	9,529	\$ 32,538,000	\$ 13,535,000
Germany	4,993	4,317	\$ 7,382,000	\$ 4,030,000
Japan	5,496	2,972	\$ 10,769,000	\$ 5,700,000
Bulgaria		1,616		\$ 1,093,000
Egypt		886		\$ 357,000
Italy		861		\$ 622,000
Singapore	666	573	\$ 1,157,000	\$ 886,000
UK	795	568	\$ 1,631,000	\$ 633,000
Canada	1,170	433	\$ 1,953,000	\$ 783,000
Malaysia	206	397	\$ 244,000	\$ 1,264,000
Robusta				
USA	28,612	61,514	\$ 19,377,000	\$ 63,078,000
Japan	45,062	50,518	\$ 35,020,000	\$ 48,456,000
Germany	51,791	47,933	\$ 29,235,000	\$ 32,331,000
Italy	24,686	20,206	\$ 17,500,000	\$ 14,426,000
Algeria	5,329	13,208	\$ 2,897,000	\$ 7,896,000
UK	11,365	9,875	\$ 5,839,000	\$ 6,150,000
Singapore	7,677	9,272	\$ 4,818,000	\$ 7,300,000
Belgium		8,493		\$ 5,361,000
Romania	9,096	7,341	\$ 5,233,000	\$ 4,068,000
Egypt	5,362	7,089	\$ 3,702,000	\$ 4,532,000

Source: Compiled by Global Development Solutions, LLC based on data from ICO

1.3 Key Market Drivers

Demand Pull vs. Supply Push Market for Coffee

There continues to be a lack of appreciation and understanding of the different market characteristic and dynamics involved in the Arabica and Robusta coffee value chains in Indonesia. Specifically, farmers as well as public sector officials view coffee as a supply driven product. While this may be the case for Robusta coffee, the Arabica coffee market is principally driven by demand from local and foreign specialty coffee wholesalers/retailers and roasters.

Characteristics of the Coffee Market in Indonesia		
Coffee type	Arabica	Robusta
Market dynamics	Demand pull	Supply push
Market segmentation	Niche	General
Standards requirement	High	Medium – low
Price volatility	Medium – low	High
Pricing	High per unit profit margin	Low per unit profit margin

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Robusta Coffee: Highly Competitive Supply Push Market

Robusta coffee continues to be treated as a commodity-based product where quantity rather than quality serves as the principal market driver. In this context, Indonesia faces stiff competition from Vietnam, Brazil, India and other coffee producing countries as reflected in the thin profit margins (refer to the table below), limited direct private sector technical support towards coffee farmers, and leveling off of investments in the sector.

Value and Volume of Robusta Coffee Exports by Destination (2004)			
Robusta		\$/Ton	Tons
USA	\$	1,025.43	61,514
Japan	\$	959.18	50,518
Singapore	\$	787.32	9,272
Italy	\$	713.95	20,206
Other	\$	703.70	57,725
Germany	\$	674.50	47,933
Egypt	\$	639.30	7,089
UK	\$	622.78	9,875
Malaysia	\$	603.15	6,035
Algeria	\$	597.82	13,208
Korea	\$	558.48	5,959

Source: Compiled by Global Development Solutions, LLC

Unit value of Robusta coffee ranges from \$558 - \$1,025, while the unit value of Arabica coffee is nearly 3 to 4 times that of Robusta. In this context, Robusta coffee continues to be a volume business where price is a driving factor in the market.

Arabica Coffee: Demand Pull Market

A distinguishing feature of the Arabica coffee sector is the stringent standards imposed on stakeholders along the value chain by buyers and international organizations. Such standards apply to the quality of coffee, as well as in the context of meeting international and corporate standards as reflected in fair trade and corporate social responsibility mandates. While there are numerous challenges in meeting international and corporate standards, compliance with such guidelines has its rewards, particularly with respect to premium prices which Arabica coffee commands in the international market. As the table above indicates, although high quality Robusta is grown in Indonesia, the unit value of Arabica coffee in the export market is as much as 3 to 4 times the value of Robusta coffee.

In the premium Arabica coffee sector, demand for Indonesian Arabica from specialty coffee wholesalers/retailers and roasters continues to increase. Similarly, specialty coffee exporters, both local and foreign, are constantly seeking opportunities to support and develop supplier relationships with producers of Arabica coffee. While Indonesia Arabica coffee commands premium prices in the international market, Indonesia's export market share worldwide is less than 2% (refer to the table below). In this context, the

potential for expanding exports is vast, and yet, the sector faces a range of challenges along the farm-to-cup value chain.

Arabica Coffee Exports by Country (2006)

	Tons	% of Total
Brazil	1,367,108	38.94%
Colombia	644,131	18.35%
Guatemala	200,892	5.72%
Peru	177,861	5.07%
Honduras	175,714	5.00%
Ethiopia	160,488	4.57%
Mexico	150,460	4.29%
Nicaragua	85,622	2.44%
El Salvador	76,115	2.17%
Costa Rica	74,781	2.13%
India	71,962	2.05%
Indonesia	68,517	1.95%

1.4 Options for Growth: Targeting the Premium Arabica Coffee Market

Given the high unit price of Arabica coffee, Indonesia's low market share in the international market, combined with the substantial demand from specialty coffee wholesalers/retailers and roasters, the potential for expanding export market opportunities in the Arabica coffee sector is substantial. At the same time, the sector faces a number of challenges which requires substantial level of sector-wide coordination through public-private dialogue and partnerships.

High percentage of mature and damaged trees

While the overall production area of coffee in Indonesia is over 1.3 million hectares, Arabica coffee is produced in less than 10% of that area. In fact, the area of production for Arabica coffee has remained the same in the past several years, which suggests that no new planting has taken place. As the table below indicates, not only has there been no increase in new areas being planted with Arabica coffee, the percentage of matured and damaged trees constitute over 66% of the total Arabica coffee area.

	Arabica Producing Areas by Region and Tree Maturity (ha) 2004 - 2005								Matured & Damaged Trees as % of Total (ha)	
	Immature (ha)		Mature (ha)		Damaged (ha)		Total (ha)		2004	2005
	2004	2005	2004	2005	2004	2005	2004	2005		
Sumatra	8,940	8,910	8,811	8,891	594	594	18,345	18,395	51.3%	51.6%
Java	5,803	5,763	5,897	5,957	1,156	1,156	12,856	12,876	54.9%	55.2%
Nusa Tenggara	2,734	2,734	9,245	9,245	2,449	2,449	14,428	14,428	81.1%	81.1%
Kalimantan	-	-	-	-	-	-	-	-	-	-
Sulawesi	15,707	15,707	30,331	30,331	7,761	7,761	53,799	53,799	70.8%	70.8%
Maluku & Papua	-	-	-	-	-	-	-	-	-	-
Total	33,184	33,114	54,284	54,424	11,960	11,960	99,428	99,498	66.6%	66.7%
% of Total	33.4%	33.3%	54.6%	54.7%	12.0%	12.0%	100%	100%		

Public-private dialogue and partnerships are essential for introducing a sector-wide replanting and tree husbandry program to replace mature trees and to improve upkeep of existing stock of Arabica coffee trees. While Sumatra is well known for its premium

Arabica coffee, opportunity for establishing a replanting program is in Sulawesi where over 70% of the planted area is maturing or damaged.

Targeted Marketing Campaigns

Targeted marketing campaigns for premium Arabica coffee from Indonesia have been limited, and have generally taken place at the individual company rather than at the national level. Given the limited volume of Arabica coffee produced in Indonesia, the sector will need to focus on targeting its marketing campaign towards countries willing to pay premium prices. As the table below indicates countries like Japan, the United States, and Germany not only import substantial volume of Arabica coffee from Indonesia, but are also willing to pay premium prices. While countries like Canada pay premium prices for Arabica coffee from Indonesia (\$1,808/ton), the volume of imports (433 tons) is only a fraction of the volume imported by the United States (9,529 tons) and Japan (2,972).

Value and Volume of Arabica Coffee Exports by Destination (2004)

Arabica	\$/Ton	Tons
Malaysia	\$ 3,183.88	397
Japan	\$ 1,917.90	2,972
Canada	\$ 1,808.31	433
Belgium	\$ 1,760.00	325
Taiwan	\$ 1,623.38	385
Singapore	\$ 1,546.25	573
USA	\$ 1,420.40	9,529
Other	\$ 1,140.93	2,370
UK	\$ 1,114.44	568
Germany	\$ 933.52	4,317
Italy	\$ 722.42	861

Source: Compiled by Global Development Solutions, LLC

Further detailed market research is required to identify market saturation and to define the competitiveness of Arabica coffee from Indonesia in a number of strategic markets. However, it is clear that public-private partnership to develop targeted marketing campaign is essential to help improve the value of Arabica exports from Indonesia.

Potential revenue gains from Arabica coffee exports

As the value chain analysis will show in the following section, yield rates for coffee in Indonesia are low compared to its competitors. Field visits confirmed that with a number of easy to implement tree husbandry activities, yield rates can be improved by up to 35%. Similarly, the stock of immature Arabica coffee trees in Indonesia is expected to become mature at a rate of approximately 15% - 20% per year. Based on these assumptions, combined with an average export price of \$1,584/ton, a number of scenarios for potential revenue gains can be analyzed.

Scenario 1: Improve on-farm production and yield rate. Under Scenario 1, farmers would be assisted to improve production and yield rate of existing Arabica tree stock by 35% through a number of simple to implement on-farm technical assistance activities. This alone would increase export revenue on an annual basis by approximately \$15.5 million and revenue from the coffee levy by \$33,438.

Summary of Potential Revenue Gains per Annum from Arabica Coffee Exports		
	Increase in Export Revenue (US\$)	Increase in Annual Revenue from Levy (US\$)
Scenario 1: Improved on-farm production and yield rate	\$15,536,723	\$33,438
Scenario 2: Increase in hectares of mature trees	\$12,966,941	\$27,908
Scenario 1 & 2 combined	\$33,042,093	\$71,113

Source: Global Development Solutions, LLC

Scenario 2: Increase in hectares of mature trees. Scenario 2 assumes that no on-farm technical support is provided and that yield rates remain the same, but the stock of mature trees increase by approximately 20%. In such a scenario, annual export revenue would increase by approximately \$12.9 million and revenue from the coffee levy would increase by \$27,908.

Potential Revenue Gains from Arabica Coffee Exports	
Scenario 1: Improve on-farm production and yield rate	
Increase on-farm yield rate (%)	35%
Estimated yield rate (ton/ha)	1,015
Current area producing > 0.6kg/ha (ha)	18,971
Production from areas with > 0.6kg/ha (ton)	14,744
Potential mature production area with increased yield rate (ha)	35,453
Production in improved area (ton)	35,996
Total production (ton)	50,740
Increase in production (ton)	9,809
Potential increase in export revenue (\$)	\$ 15,536,723
Potential increase in annual levy revenue (\$)	\$ 33,438
Scenario 2: Increase in hectares of mature trees	
Increase in hectares of mature trees (%)	20%
Total productive area (ha)	65,309
Increase in mature production area (ha)	10,885
Increase in production based on current yield rate (ton)	8,186
Potential increase in export revenue (\$)	\$ 12,966,941
Potential increase in annual levy revenue (\$)	\$ 27,908
Scenario 3: Increase in hectares of mature trees and improved on-farm production and yield rate	
Increase in production based on improved yield rate (ton)	9,809
Increase in mature production area (ha)	10,885
Increase in production from mature production area based on improved yield rate (ton)	11,051
Total increase in production (ton)	20,860
Potential increase in annual export revenue (\$)	\$ 33,042,093
Potential increase in annual levy revenue (\$)	\$ 71,113

Scenario 3: Increase in hectares of mature trees and improved on-farm production and yield rate. Scenario 3 combines the first two scenarios, which has the potential for improving annual export revenue from Arabica coffee to approximately \$33 million, and increase in revenue from the coffee levy to \$71,113.

These scenarios suggest that the scope for improving export revenue from Arabica coffee is readily attainable. Combining these improvements with a replanting program to replace mature trees is likely to have a substantial magnifying affect on the Arabica coffee sector, but will require a comprehensive plan to help coordinate both public and private sector initiatives and investments in the sector.

2.0 Institutional Support Structure and the Supply Chain

The coffee sector in Indonesia is represented by AEKI (Coffee Exporters Association of Indonesia), a para-statal organization under the Ministry of Trade. As the title of the organization suggests, AEKI represents only exporters. In this context, AEKI's mandates are limited and do not cover the interest and needs of the farming and primary processing sectors where the bulk of the supply side bottlenecks is found.

In addition, there is a general consensus among both industry and public sector sources directly engaged in the coffee sector that AEKI has not performed well in representing the interests of the sector, particularly in promoting premium coffee in the international market. Combined with the fact that the coffee sector in Indonesia is currently void of an umbrella organization that facilitates the needs and interest of the entire farm-to-cup supply chain, both the private and public sector officials have expressed their interest in establishing an independent steering committee or another entity with representation from stakeholders along the entire coffee supply chain.

At the farming level, the Ministry of Agriculture has extension offices at the provincial level, but between the lack of funds, capacity and know-how, effective and meaningful extension services have not been available to coffee farmers.

Supply Chain Structure for Arabica Coffee: An Example from Sumatra

Sumatra is one of the leading sources for premium Arabica coffee in Indonesia. In this context, the supply chain structure for Arabic coffee presented below reflects the relationship between farmers, collectors, brokers, and processors/traders in North Sumatra.

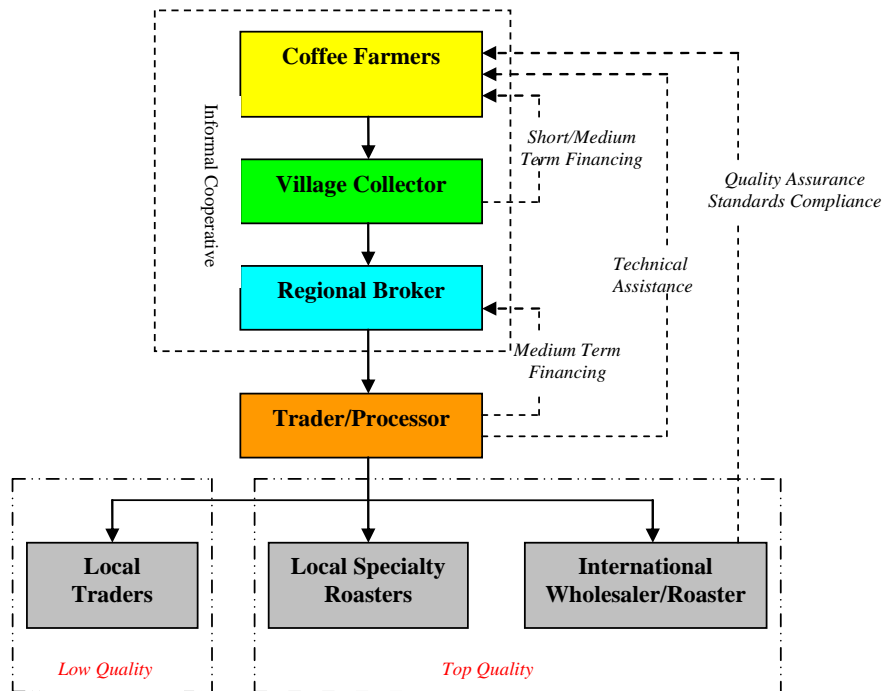
As the diagram below indicates, the supply chain from farmer to the end buyers of coffee is a simple vertical supply chain where relationships between farmer, village collector, regional broker and the processor/trader is built on trust with no contractual arrangements.

Coffee Farmer: A coffee farmer belongs to an informal cooperative, where the regional broker acts as a marketing agent to identify and negotiate sales of coffee to processors/traders. As a member of an informal cooperative, farmers benefit from access

to inputs where some portions of inputs required by a farmer such as fertilizers are provided free of charge to its members. In addition, after covering all costs and paying salary and commission to the regional broker, profits from sales of coffee to the processor/trader are shared by its members.

Village Collector: The village collector provides both short and medium term finance to coffee farmers who utilize the services of the collector. Short term financing occurs on a regular basis whenever coffee is harvested to help farmers pay for hired local labor. Generally such loans are 4 – 5 days in duration. Medium term financing is provided to farmers after harvest for purchase of inputs such as fertilizers and sprays. Medium term loans are generally for duration of up to 9 months. Both types of loans are interest-free, and 100% of the farmers request financing from their collectors. According to village collectors, the default rate is virtually zero.

**Supply Chain for Arabica Coffee in Indonesia:
An Example from Sumatra**



Global Development Solutions, LLC

When coffee is delivered, village collectors pay farmers on the spot at the prevailing market price (market price information is readily available at the local market). The price offered to farmers may be subject to discount if the moisture content of the parchment is high. Generally, acceptable moisture content at delivery is around 45%.

Farmers generally bring their parchment to the village collector where it is measured for volume using a tin can called the 'tumba' which holds 1.1 kg (2 liters) of parchment. During the time of this research, farmers were receiving a price of between Rp9,500/kg (September) – Rp11,500/kg (December).

Given the limited financial means of a village collector, they are capable of collecting coffee from up to 25 farmers. When asked whether collectors would consider borrowing money from a financial institution to help expand their business, all collectors responded negatively pointing out that they were not interested in going into debt and did not trust banks with their money.

The market for village collector is very competitive, which allows farmers to pick and chose a collector with whom to work. However, the informal lending scheme offered by village collectors to their coffee suppliers acts as an effective mechanism to encourage loyalty among coffee farmers to their respective village collectors. According to interviews, on average, a village collector charges the regional broker approximately Rp200/tumba (1.1kg) for his services.

Regional Broker: The primary role of the regional broker is to represent the interest of the cooperative by facilitating the sales transaction between the processor/trader and the coffee farmer, using the village collector as an intermediary to help consolidate production. The regional broker collects coffee from the village collector three times a week and delivers the coffee to a processor/trader in the city where he is paid either on the spot or within two to three days, at the latest, following delivery. The price received by a broker generally reflects the prevailing international price for coffee on the day of the transaction. Brokers usually have their own truck which they either drive themselves or hire a driver.

In addition, the regional broker is also a source of information and acts as a conduit between the processor/trader and the coffee farmer. For example, CBB (coffee berry borer) is a growing problem among coffee farmers in some regions, and the regional broker points out to the trade/processor some of the 'hot spots' and seeks guidance and assistance to tackle the CBB. Similarly, processor/trader may provide guidance to the regional broker about improving the cleanliness of the parchment, which is then communicated back to the village collector and the coffee farmer for further action. In this context, regional brokers play an important role in a sector where a formal market structure has yet to evolve.

Processor/Trader: In North Sumatra alone there are over 40 companies exporting coffee. There is very little accurate information about the actual number of processors/traders operating in the country, and whether they are a local company or a part of an international company with a global network in the coffee industry.

The focus of this analysis is on processors/traders which are a part of an international company. The rationale for this approach was that these companies were able to command the highest price for coffee in the wholesale market, and their purchase of coffee was driven principally on quality where adherence to international quality standards and compliance to codes of conduct form the foundation of their business transaction with coffee farmers.

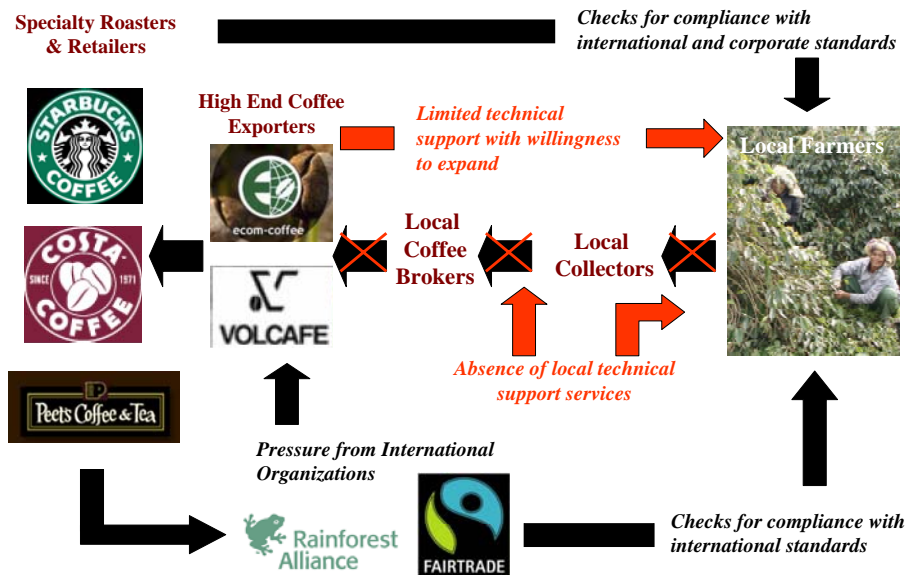
Given their concern for quality, processors/traders provide technical support to their farmers, often by dispatching their own field agents who have some level of expertise on agronomic issues related to coffee. In addition, to address problems associated with CBB, some processors/traders are developing field trials with coffee farmers on the effective use of alcohol traps to help curtail damage to the coffee from CBB. In this context, processors/traders have a vested interest in supporting coffee farmers, particularly given that extension services are not available to provide support to coffee farmers.

As a part of a large international company, coffee purchased by the processor/trader is sold to a wide range of clients including wholesalers and roasters worldwide. In this context, in addition to ensuring quality, the principal role of the processor/trader is to:

- Sort, clean and dry incoming coffee;
- Cup and grade coffee; and
- Weigh, pack and facilitate shipping arrangements for export.

International Wholesaler/Roaster: Companies like Starbucks purchase a substantial volume¹ of coffee from Sumatra. In this context, they have a vested interest in ensuring quality and compliance with international standards such as Fairtrade and Rain Forest Alliance. As a part of their compliance requirement, agents are sent to the field to help ensure that coffee farmers are following basic guidelines prescribed by these international organizations.

Weak Farm-to-Export Linkage in the Arabica Market in Indonesia



This not only helps guarantee a premium price for the coffee at the wholesale/retail level, but also responds to the corporate social responsibility agenda that companies like Starbucks adhere to.

¹ While accurate information is not available, some estimates suggest that Starbucks purchases as much as 60% of all premium Arabica produced in Sumatra.

In this context, given the absence of local support services, processors/traders have stepped up their technical support to local farmers, not only to secure adequate volume of coffee, but also to help ensure that farmers are complying with both corporate social responsibility requirements of international buyers, as well as international standards imposed by watchdog organizations.

3.0 Integrated Value Chain Analysis for Arabica Coffee in Northern Sumatra

3.1 Product Profile

The value chain analysis profiles three different non-shade Arabica coffee farms in Northern Sumatra. The area selected for the analysis includes the Tappe Tappe Village and the Tigarunggu Village located at about 1,300 meters above sea level. Coffee farming is relatively new to the area and most plants are no more than 5 years old.

Farms profiled for this analysis grew the Ateng² variety, whose seedlings are locally available. Local farmers also refer to a more recent variety named ‘Sigararutang’³ as Ateng, which is preferred for its quick yielding characteristics (cherry ready for harvest by the second year), and its year round production of cherry. Sigararutang is a large bean with brown flesh, and is reportedly easy to maintain with minimal input required compared to other varieties.

3.2 Integrated Value Chain Analysis

The coffee farming value chain is divided into 5 distinct areas of value addition, namely:

- Land preparation;
- Fertilizing;
- Spraying;
- Plant Maintenance; and
- Harvesting.

Farmers in this region devoted no resources to sprays and plant maintenance. As will be shown in the analysis, the absence of plant maintenance has had a tremendous impact on the poor yield rates experienced by coffee farmers.

Coffee farms profiled for this study range in size from 0.5 – 1.2 hectares with yield rates ranging from 6,900 kg/ha to 17,600 kg/ha of cherry. As the summary table below indicates, yield rates and production costs vary widely between farms, which provide some insights into some of the challenges faced by coffee farmers in the region.

² Ateng (Aceh Tengah) was introduced in the early 1990s to the region.

³ Sigararutang stands for *segera membayar hutang* which translates to ‘quickly repay loan’.

Summary of Arabica Coffee Farming Cost Comparison Across Villages in Sumatra

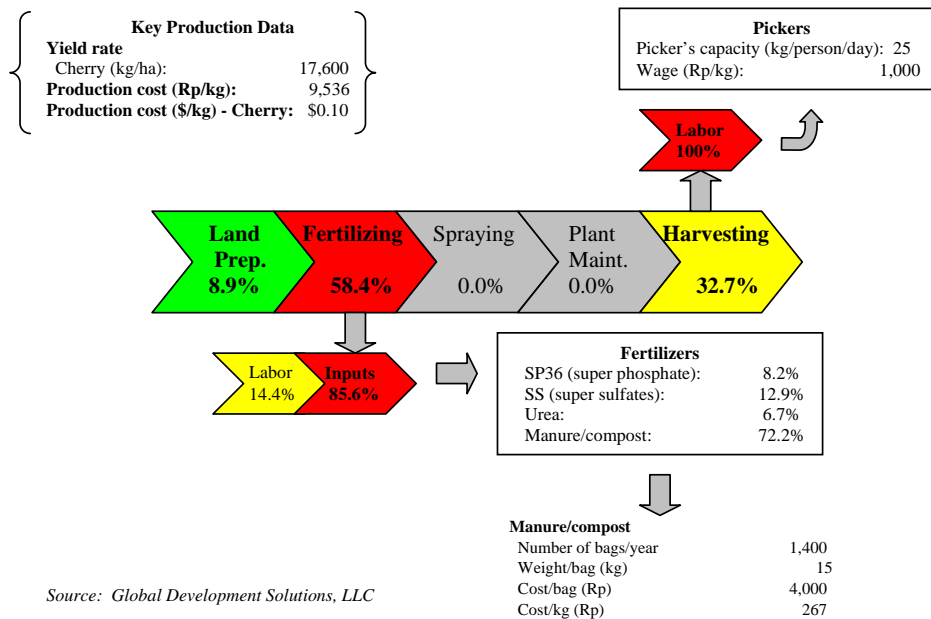
	Tappe Tappe Village	Tigarunggu Village (1)	Tigarunnggu Village (2)
Yield Rate:			
Cherry (kg/ha)	17,600	6,900	8,800
Manure/Compost Use:			
Total Use (kg/ha)	21,000	6,000	6,300
Total Cost (Rp/ha)	5,600,000	1,600,000	1,680,000

Source: Global Development Solutions, LLC

3.2.1 Comparison of Value Chains for Three Coffee Farms

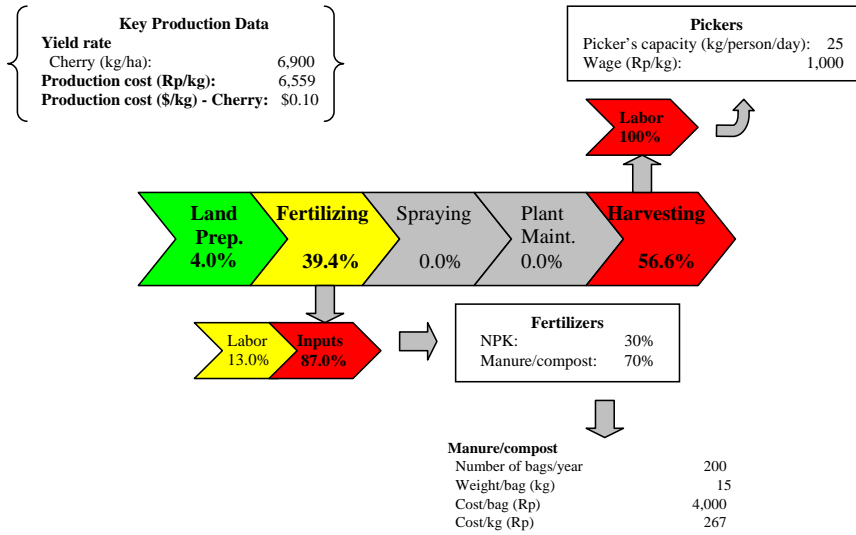
Given the minimal maintenance of the coffee trees, 87% - 96% of total value added came from fertilizing and harvesting. The following schematic provides a snapshot of the value chains for three coffee farms.

Diagram XXX: Value Chain for Smallholder Coffee Production in Sumatra, Indonesia
Tappe Tappe Village

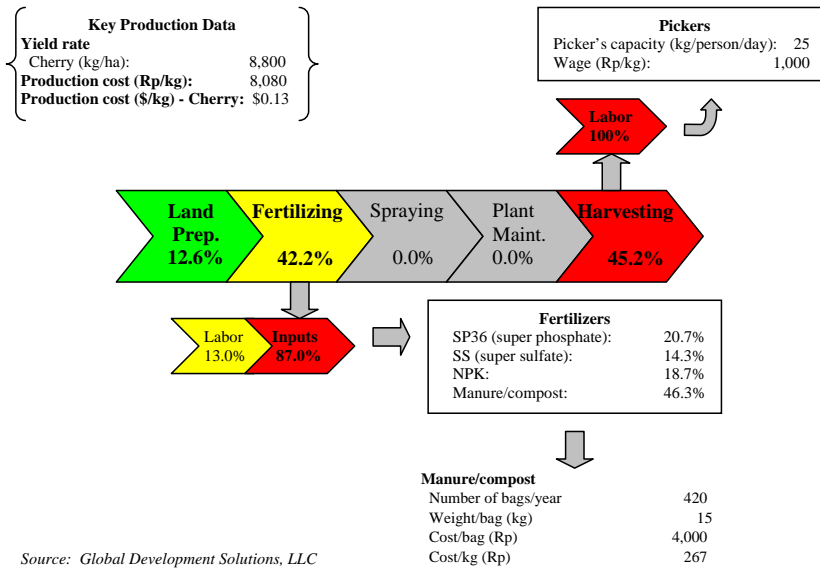


Source: Global Development Solutions, LLC

**Diagram XXX: Value Chain for Smallholder Coffee Production in Sumatra, Indonesia
Tigarunggu Village (1)**



**Diagram XXX: Value Chain for Smallholder Coffee Production in Sumatra, Indonesia
Tigarunggu Village (2)**



The coffee farm in Tappe Tappe Village enjoyed yield rates which were more than 2 times that of the other two farms. At the same time, however, investments in fertilizers, specifically, manure and compost was more than 3 times that of the other two farms. Interviews with farmers consistently point to trial-and-error as the only means by which farmers determined the amount of fertilizer to be applied. Similarly, farmers did not keep field accounts, so they had limited understanding of the relationship between cost and yield. This lack of understanding and the absence of extension services is reflected in the fact that the farm (Tigarunggu Village 1) that used the least amount of manure (6,000

kg/ha) had the most competitive production cost (\$0.10/kg - Cherry) between all three farms.

Benchmarking Fertilizer Use: The use of fertilizer among coffee farmers in Northern Sumatra is ad hoc, and as a consequence, when compared to coffee farmers in Kenya, for example, the cost of fertilizer per kg of coffee cherry production is somewhat higher (refer to the table below). At the same time, however, in the absence of plant maintenance, the overall cost of production measured in \$/kg of cherry is somewhat lower in Northern Sumatra.

Benchmarking Fertilizer Use and Production Cost for Arabica Coffee (\$/kg - Cherry)

	Fertilizer Use		Production Cost	
Tappe Tappe Village	\$	0.06	\$	0.10
Tigarunggu Village (1)	\$	0.04	\$	0.10
Tigarunggu Village (2)	\$	0.05	\$	0.13
Kenya Smallholder	\$	0.03	\$	0.19
Kenya Small Estate	\$	0.04	\$	0.21
Lao Smallholder	\$	-	\$	0.13

Source: Global Development Solutions, LLC

The critical issue is whether coffee farmers in Northern Sumatra could improve yield rates through other means besides intensive fertilizing, such as plant maintenance and spraying for CBB.

Absence of Plant Maintenance: Field interviews indicate that none of the coffee farmers are engaged in plant maintenance – specifically, tree husbandry, include proper pruning and integrated pest management to control CBB and stem borer.

Due to the absence of pruning, the coffee trees in Northern Sumatra suffer from dense foliage, which contributes to lower concentration of coffee cherry, the inability to keep the base of the tree free of weeds and cherry infested with CBB, and increase the time it takes for pickers to harvest ripe cherry during harvest (refer to the table below).

Benchmarking the Impact of Poor Tree Husbandry in Northern Sumatra on Fruit Concentration and Labor Productivity

	Fruit Concentration Cherry (kg/tree)	Labor Productivity Harvest (kg/day)
Tappe Tappe Village	8	25
Tigarunggu Village (1)	4.9	25
Tigarunggu Village (2)	5.2	25
Kenya	2.2 - 9.1	22.5 - 60
Lao	1.4 - 5.2	60

Source: Global Development Solutions, LLC

Interviews suggest that farmers had no knowledge of basic pruning techniques, and feared that pruning would damage or otherwise reduce yield rates. As a consequence, none of the farms visited had pruned their trees. While village collectors and brokers

were aware of the need for pruning, they too had no knowledge about pruning techniques. In this context, rather than introducing tree husbandry techniques, particularly to help control the spread of CBB, processors/traders were starting to introduce the use of alcohol traps.

Acknowledging the problem with CBB and stem borer, processors/traders are considering establishing training centers, at their own expense, to help introduce extension services to their own suppliers. While this would help fill the void left by the absence of extension services in the region, the scope and reach of such a program would be limited given that such centers would generally cover a limited number of farmers, where preference would be given to farmers who supply to a particular processor/trader.

3.2.2 Primary Processing (On-Farm Pulping)

Coffee farmers practiced on-farm pulping using a homemade wood pulper. Most farmers do not have access to a gas motor, so pulping is done manually. According to interviews, given the poor quality of the pulping equipment, beans are subject to damage during pulping, where as much as 25% of the throughput is damaged. Interviews suggest that there is no centralized mechanical pulping.

According to interviews, pulping costs ranged from \$0.06/kg - \$0.11/kg. The second farmer from Tigarunggnu Village used a rented gasoline motor to power his wooden pulper, but as the value chain analysis indicates, the cost per kg of parchment did not vary. No reasonable explanation for the wide variance in cost between primary processing in Tappe Tappe Village and Tigarunggnu Village could be found with the exception that coffee farmer in Tappe Tappe incurred less than one-half of the labor cost during drying and packing than the other two farmers.

Comparison of Primary Processing Cost (On-farm Pulping) in Norther Sumatra					
Tappe Tappe Village		\$ 0.06 \$/Kg			
	Pulping	Drying/Packing	Transport	Total	
Unit Value	\$ 0.03	\$ 0.03	\$ 0.01	\$ 0.06	
% of Total	40.9%	48.4%	10.7%	100.0%	
Tigarunggu Village (1)		\$ 0.11 \$/Kg			
	Pulping	Drying/Packing	Transport	Total	
Unit Value	\$ 0.03	\$ 0.07	\$ 0.01	\$ 0.11	
% of Total	30.9%	62.7%	6.3%	100.0%	
Tigarunggu Village (2)		\$ 0.11 \$/Kg			
	Pulping	Drying/Packing	Transport	Total	
Unit Value	\$ 0.05	\$ 0.05	\$ 0.00	\$ 0.11	
% of Total	49.9%	50.1%	3.9%	100.0%	

Source: Global Development Solutions, LLC

Drying the parchment is generally done outdoors on a tarp, where the parchment is set out for 1 – 2 days (depending on the weather). At the time of pulping, the moisture content is between 50% - 60%, and the drying process reduces the moisture content to

about 45%. Soon after drying, the parchment is packed into a jute bag and transported to the village collector.

Benchmarking primary processing costs with Kenya and Lao suggests that coffee farmers in Northern Sumatra are well within the acceptable range for pulping costs, but the benchmarking data below does not take into account the 25% damage losses incurred by farmers in Northern Sumatra through the use of poor pulping equipment.

Benchmarking Primary Processing (Pulping) Cost for Arabica Coffee

	\$/kg
Northern Sumatra	\$0.06 - \$0.11
Kenya	\$0.06 - \$0.18
Lao	\$0.02 - \$0.03

Global Development Solutions, LLC

The use of rudimentary pulping equipment at the individual farm level and the absence of a centralized mechanical pulping facility/service is partly a reflection of the absence of market structure and institutional capacity of the coffee farming sector in Northern Sumatra. While some village collectors provide pulping services, capacity and quality of service continues to be limited. In this context, the introduction of support services such as centralized mechanical pulping may be essential to help accelerate broader commercialization of Arabica coffee production in Northern Sumatra.

3.2.3 Secondary Processing

Once the village collector receives the parchments, it is weighed and additional drying takes place before the broker collects the parchment for delivery to the processor/exporter.

Generally, the broker purchases parchment from the village collector at a price of about 11,000 Rp/kg, and plays the village collector a margin of Rp200/tumba (Rp182/kg). The broker makes the 125 km drive into Medan three times per week to deliver coffee to the processor/trader. The transport cost is approximately Rp125/kg using a truck owned by the broker.

Value Chain for Coffee Broker in Sumatra/Medan (Rp/kg)

	Parchment (Labu)	Transport	Total	% of Total
Labor		40	40	0.4%
Material	10,273		10,273	93.1%
Fees	432	3	435	3.9%
Fuel/Maintenance		291	291	2.6%
Total	10,705	334	11,039	100.0%
% of Total	97.0%	3.0%	100.0%	

Source: Global Development Solutions, LLC

It was noted that during the 125 km drive, brokers are stopped at least 3 times on a regular basis by police and other public sector officials. Generally, the informal payments range from Rp1,000/stop for a pick up truck to Rp5,000/stop for a large lorry.

3.2.4 Preparing Coffee for Export

Brokers transport parchment directly to the facility of a processor/trader usually located in Medan where parchment undergoes the following steps before the coffee is loaded on to a container for shipment:

- Inspection/cupping;
- Sorting/grading;
- Drying;
- Cleaning/separating;
- Cupping;
- Weighing;
- Bagging;
- Loading; and
- Fumigation and inspection

According to interviews with processors/traders, it costs approximately Rp799/kg (\$0.09/kg) for hulling and handling (refer to the table below). Over 94% of the value added comes from hulling, of which 43% of the value comes from labor inputs.

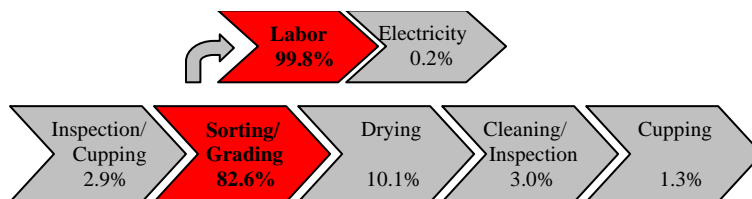
Secondary Processing - Medan Indonesia (Rp/kg)			
	Hulling	Handling	Total
Total	753.7	45.21	798.86
% of Total	94.3%	5.7%	

Secondary Processing - Medan Indonesia (\$/kg)			
	Hulling	Handling	Total
Total	\$ 0.08	\$ 0.00	\$ 0.09
% of Total	94.3%	5.7%	

Source: Global Development Solutions, LLC

Further analysis suggests that labor input for sorting and grading constitutes 82.6% of the total value added for hulling, of which 99.8% was found to be labor input (refer to the table below).

**Value Chain for Secondary Processing (Hulling):
Arabica Coffee, Medan, Indonesia**



Global Development Solutions, LLC

While in countries like Kenya sorting is sometime done using mechanical sorting equipment, sorting in Northern Sumatra is done by hand by trained laborers. Sorters in Medan are generally paid by the amount of parchment they sort at an average rate of Rp275/kg. A skilled sorter is able to sort between 60 – 80 kg/day, thus generating an income of about Rp16,500 – Rp22,000/day (\$1.79 - \$2.39/day).

As the table below indicates, there is a substantial difference in sorting costs between Northern Sumatra, Kenya and Lao. In Kenya, cooperatives and large processors use machine sorting. In Lao, large processors also used machine sorting, but smaller local processors rely on manual sorting very similar to that in Indonesia.

Benchmarking Secondary Processing for Arabica Coffee

	\$/kg
Northern Sumatra	\$ 0.09
Kenya	\$ 0.06
Lao	\$ 0.01

Source: Global Development Solutions, LLC

At the time of this analysis it was not clear whether an adequate volume of coffee is processed to warrant an investment in a sorting machine, but these figures suggest that further consideration may be required for investing in sorting equipment or alternatively to introduce further training to help improve the labor productivity of sorters.

3.3 Export Transaction Costs

Generally, coffee is exported in ventilated 20’ containers, which can hold up to 18 tons of coffee. According to interviews, export transaction costs associated with delivering a 20’ container of coffee from a processing facility in Medan to the Belawan Port is approximately \$372.

Export Transaction Cost for Arabica Coffee Produced in Northern Sumatra

	Transport	Certification	Freight Forwarding	Port Charges	Total
Unit value	\$ 139.13	\$ 92.39	\$ 34.78	\$ 105.87	\$ 372.17
% of Total	37.4%	24.8%	9.3%	28.4%	100.0%

Source: Global Development Solutions, LLC

High Inland Transport Cost

As the value chain for export transaction costs indicates, transport from the processing facility to the port constitutes 37.4% of the total value added. In this particular example, the distance between the processing facility and the port was approximately 35 km, where the transport cost for a 20’ container was Rp1,280,000 (US\$139.13), which translates to \$0.22/km/ton. As the table below indicates, based on dollars per km ton, trucking charges in Medan are extremely high compared to other countries like Kenya where inland transport costs are approximately \$0.06/km/ton.

Benchmarking Inland Transport Cost

Country	\$/km/ton
India	\$ 0.019
Pakistan	\$ 0.024
Ethiopia	\$ 0.038
Tanzania	\$ 0.057
Kenya	\$ 0.059
Mozambique	\$ 0.146
South Africa	\$ 0.200
Indonesia (Medan)	\$ 0.220

Source: Global Development Solutions, LLC

While increase in fuel price may in part be a cause of the high transport cost, further analysis is required to determine whether there is adequate volume and competition in the transport sector, and to identify measures that can be undertaken by both the private and public sectors to help improve the competitiveness of inland transport costs.

Port Charges: High Terminal Handling Charges

The export transaction cost analysis indicates that port charges constitute approximately 28.4% of the total export transaction costs. Further analysis suggests that 89% of the port charges are reflected in the terminal handling charges (THC), which in Belawan Port is \$95.

Benchmarking Terminal Handling Charges

Country	THC
Belawan, Indonesia	\$ 95
Mombasa, Kenya	\$ 70
Nongkhai, Lao	\$ 65
Maputo, Mozambique	\$ 90

Source: Global Development Solutions, LLC

As the table above indicates, when compared to countries like Kenya and even Mozambique, THC is substantially higher at Belawan Port (refer to the table above). Freight forwarders raised concern about the high THC at Belawan Port, and how it is making the port less attractive as a port of call. In this context, further analysis is required to compile a profile of port charges across Indonesia benchmarked against competing countries to help reassess the pricing structure of port services in Indonesia.

High Certification and Documentation Charges

Coffee exported from Indonesia may require at least four types of certification and documentation (refer to the table below).

Certification and Documentation Requirements for Exporting Coffee from Indonesia		
Certificates and Documentation	Government Ministry/Department	Time Lapse
Certificate of Origin	Customs (Quarantine Office)	2 days
Certificate of Quality	Ministry of Industry	2 days
Certificate of Conformity	Ministry of Trade	1 day

Phyto-sanitary	Customs (Quarantine Office)	1 day
<i>Source: Global Development Solutions, LLC</i>		

Interviews with exporters suggest that the time required to obtain the necessary certificates and documentation is fast, and can be undertaken simultaneously. However, it is not evident whether the high charges are warranted. Similar certificate and document charges for exporting coffee from Lao, for example, are substantially lower than costs incurred by coffee exporters in Indonesia (refer to the table below).

Benchmarking Certification and Documentation Costs

Certificates and Documentation	Indonesia		Lao	
Certificate of Origin	\$	27.17	\$	11.00
Certificate of Quality	\$	27.17	\$	1.92
Certificate of Conformity	\$	16.30		None
Phyto-sanitary Inspection	\$	21.74	\$	1.92

Source: Global Development Solutions, LLC

According to processor/exporters, not all coffee importers in the U.S. and Europe require all four certificates and documentation. With this said, however, exporters expressed some concern over the value of the service they receive from the Government. In this context, further analysis may be warranted to identify whether cost cutting measures and streamlining pricing structure for certification and documentation can be introduced.

4.0 Conclusions and Recommendations

Given the suitable growing environment, and growing interest by farmers to invest in coffee production, the opportunity to expand the production and exports of high quality Arabica coffee is substantial. And yet, in many parts of Sumatra, the coffee sector continues to lack the organization and market infrastructure to transform coffee production into a major competitive force in the international market. While Sumatra has done well as a niche player in the premium coffee sector, ample market opportunities exists to expand production without sacrificing quality.

In the absence of strong on-farm technical support through both private and public provisioning of extension services; however, the level of on-farm technical know-how among coffee farmers is currently limited and does not reflect the technical skills required to aggressively expand market share in the international market.

The Integrated Value Chain Analysis highlighted a number of shortcomings along the coffee value chain, which indicates that establishing an umbrella organization is critical to help facilitate a public-private dialogue between key stakeholders along the entire farm-to-export supply chain. Such an organization is essential for formulating a chain-wide strategy to help tackle the range of policy and market based distortions along the coffee value chain.

The following matrix highlights key issues identified as constraints inhibiting the growth and competitiveness of the Arabica coffee sector, and helps prioritize areas of intervention.

Short, Medium and Long Term Interventions Required to Strengthen the Competitiveness of the Arabica Coffee Sector in Indonesia

	Actions Required	Responsible Entity		
		Gov't	Private	Joint
Short Term Interventions				
1	Initiate public-private dialogue to articulate a medium and long-term strategic plan for expanding exports			X
2	Introduce basic tree husbandry techniques		X	
3	Initiate public-private dialogue to develop and implement a tree replanting program			X
4	Establish organizations to help represent the interest of coffee farmers			X
5	Encourage private sector delivery of on-farm extension services			X
Medium Term Interventions				
1	Conduct soil analysis to identify fertilizer requirement	X		
2	Develop centralized mechanical pulping service			X
3	Improve access to short and medium term trade finance		X	
4	Improve the competitiveness of inland transport		X	
5	Restructure the coffee grading standard to reflect international standards			X
6	Reduce export certification and documentation costs	X		
7	Reduce high terminal handling charges	X		
8	Develop an industry-wide organization to represent all stakeholders along the farm-to-cup value chain			X
9	Introduce training credits or other forms of incentives to encourage private sector delivery of training to farmers			X
10	Establishment of a steering committee or another entity to represent the interest of the entire farm-to-exporter supply chain			X
Long Term Interventions				
1	Strengthen capacity and access to on-farm extension services			X
2	Strengthen R&D capacity to develop new varieties	X		