Original Research Article

Indonesian Coffee Development Path: Production and International Trade

ABSTRACT

Aims: The objectives of this study are (i) to compare Indonesia's coffee production efficiency among the top five world coffee-producing countries, (ii) to analyze Indonesia's coffee competitiveness against major world coffee producers in the international market, and (iii) to analyze Indonesia's coffee export structure based on unit price of export price to determine profitable differentiation of export destinations.

Methodology:A descriptive comparative analysis was conducted on coffee productivity (kg/ha) in the major coffee-producing countries and on the export unit price (USD/ton) received by Indonesia and other exporting countries.To reveal the comparative advantage of Indonesian coffee in the global market, Symmetry Revealed Comparative Advantage (RSCA) is employed, and GL-Index is utilized as an analysis tool for export destination differentiation.

Results: The results of this study are (i) Indonesian coffee production is very low due to various factors, including production techniques that do not apply innovation to increase production, (ii) the composition of production is dominated by Robusta Coffee which is known to get a lower price than Arabica Coffee, (iii) exports are in the form of low-quality products so that they attain a meager unit price even though Indonesian coffee has competitiveness with SRCA> 0, and (iv) GL-Index analysis shows that the most profitable export destinations for Indonesian coffee are to the United States and Australia and New Zealand, while contrary to what has been assumed, exports to West Europe, Northeast Asia and Middle East and North Africa do not show conclusive results while ASEAN (Association of Southeast Asian Nations) is not a profitable export destination.

Conclusion: At various supply chain stages, Indonesian coffee needs to improve, especially at the production and export levels. Appropriate policies to address the weaknesses of Indonesia's coffee position have the potential to catch up with the existing productivity and export gaps.

Keywords: Coffee Global Market, Indonesian Coffee Export, Export destination differentiation, GL-Index.

1. INTRODUCTION

Indonesia's agricultural sector plays three strategic roles in the economy [1]: (i) providing food for the community to realize food security, (ii) providing employment, and (iii) reducing poverty. 27.68 million Indonesian households earn income from managing farms [2], which employs 40.69 million people. In the last decade, the agricultural sector's contribution (farm level) to GDP was around 13%, with a downward trend. However, learning from the experience of industrialized countries such as the United States, the contribution of the

agricultural sector along with related sectors such as the food industry and culinary services, as well as marketing of products and distribution of production inputs and equipment can reach ten times the GDP of the primary agricultural sector [3].

Analysis by subsector shows that in the last decade, the plantation subsector has become the main contributor to the agricultural sector GDP, previously led by the food crop subsector. The contribution of the plantation subsector is between 28 and 30%, while the contribution of the food crop subsector is between 20% and 26%, with a declining trend [4].

Coffee is one of the leading commodities of Indonesia's plantation subsector, along with Palm Oil, Rubber, and Cocoa. FAO [5] shows Indonesia is the world's fourth-largest coffee producer after Brazil, Vietnam, and Columbia. Globally, coffee is one of the most traded agricultural commodities in the world [6], and according to [7], the demand for coffee is growing.

Smallholder farmers produce more than 95% of Indonesian coffee with an average area of 0.6 ha ([8]; [9]; [10]; [11]; [12]; [13]) which is a source of income for nearly two million households ([14]; [13]). Assuming each household consists of at least four individuals, coffee generates income for at least eight million people. Thus, developing coffee agribusiness will contribute significantly to welfare improvement or poverty alleviation in rural Indonesia.

World Coffee Research [13] believes that the Indonesian government pays less attention to coffee as a commodity due to more significant palm oil and rubber exports to the economy, while public investment in research and development of food crops takes center stage. As a result, Indonesia is known as a producer of lower-quality Robusta Coffee [14], and Indonesia's export market share declined by almost 40% between 2009 and 2018 [[9].

Various studies have shown a close link between exports and economic growth, which gave rise to the export-led growth hypothesis [15] verified in both developed and developing countries (e.g., [16]; [17]; [18]). For Indonesia, this hypothesis applies nationally ([19]; [20]; [21]) as well as in provinces such as North Sumatra [22], East Java [23], and South Sulawesi [24]. The effect of exports as a driver of economic growth will be more significant if a country diversifies its exports, in the sense of increasing exports of commodities with high-added value replacing low-quality commodities ([25]; [26]; [27]).

The coffee value chain is complex, due to the following factors ([14]; [6]; [28]; [13]): (i) coffee goes through a large number of production stages and many actors are involved along these stages, (ii) coffee is mainly produced in developing countries while most of it is consumed in industrialized countries (representing vertical value chains or North-South linkages), (iii) an increasing number of non-producing countries participate in coffee exports, (iv) the global value chain for coffee is dominated by a small number of critical companies all based in Western Europe or the United States, and (v) the global value chain for coffee is dominated by a small number of significant companies all based in Western Europe or the United States, and (v) the global value chain for coffee is dominated by a small number of significant companies all based in Western Europe or the United States, the major companies based in Western Europe or North America, and (v) increasing inequality in the global coffee value chain in the form of the share of total revenues increasingly shifting in favor of consuming countries (in the 1980s producing countries still controlled 20% of total revenues and consuming countries 55%, in the 1990s the share of total revenues accruing to producing countries fell to 13% while in consuming countries it increased to 78%). Large global roasting companies have dominated the coffee market to such an extent that they control the entire value chain and impose product and process standards that suppliers elsewhere must adhere to [14]. In response to global coffee market conditions, [14] and [12]

advocate increasing productivity and improving quality in the sense of product upgrading rather than functional upgrading, while [11] make diversification of market destinations a policy option to increase export value which will lead to an increase in coffee farmers' income.

This research aims to analyze Indonesia's position in the global market from the production stage to the trade of production products. In detail, the research objectives include (i) comparing Indonesia's coffee production efficiency with that of significant world coffee producers, (ii) analyzing Indonesia's coffee competitiveness against major world coffee producers in the international market, and (iii) analyzing Indonesia's coffee export structure based on export price per unit as a basis for determining profitable export destinations.

2. METHODOLOGY

Indonesia's position in coffee production among world coffee producers can be assessed by comparing coffee farm productivity (kg/ha). In contrast, the position of Indonesian coffee among other exporting countries' products can be observed by comparing the unit price earned. Productivity information can be obtained from FAO, and unit price data is available from UNComtrade. UNComtrade refers coffee and its derivatives (processed products) into the harmonized system with the code HS-0901.

The competitiveness of a product in the export market (local, country, region, and world) can be assessed with various analytical techniques/methods [29]. One popular analytical tool is RCA (revealed comparative advantage), which was first introduced by Balassa in 1965. This technique is widely used because the required data is easy to obtain, and the data processing is simple. An export commodity with RCA > 1 indicates that the commodity has a comparative advantage in the export destination market [30]. From the original Balassa RCA formula, [31] inventoried nine modifications/variations. [32] outlined various alternatives for improving the ability to measure RCA that has been developed since the 1980s, such as (i) the Lafaye index, (ii) the symmetric RCA index, (iii) the weighted RCA index, (iv) the additive RCA index, and (v) the normalized RCA (NRCA). In this research, the index used is symmetric RCA (SRCA). The symmetric RCA index is a modification of Balassa's RCA, which aims to ensure that the range of values obtained is between -1 and +1, provided that SRCA > 0 indicates that the observed export commodity has a comparative advantage in the export destination market. In contrast, a value smaller than zero indicates no competitiveness. This comparative advantage index is formulated in equation (1).

$$SRCA = (RCA - 1)/(RCA + 1) \quad (1)$$

Meanwhile, RCA is obtained by formula (2):

$$RCA = \frac{Xij/Xit}{Xnj/Xnt} = \frac{Xij/Xnj}{Xit/Xnt} \quad (2)$$

Where X denotes export value, *i* is the exporting country, *j* is the observed export commodity, *t* is the set of commodities, and *n* is the countries. For Indonesian coffee exports in the world market applies:

X*ij* = Indonesia's coffee export value X*nj* = world's coffee export value
X*it* = Indonesia's total export value for all goods X*nt* = world's total export value for all goods

This study applies the product differentiation analysis approach to export market/country destination differentiation. Product differentiation analysis derives from the view that export quality is reflected in the value or price received. Products in the form of raw materials will receive a lower/cheaper price than intermediate goods, which are processed from raw

materials and will be further processed into final goods. Final goods, which are consumer goods, receive a higher price than intermediate goods. Therefore, an increase in export quality can be read from the unit price of the product in question. In intra-industry trade, the pattern of product differentiation can be seen where the position of a product is seen by comparing the export unit price to the import unit price of the same type of product. The comparison of unit prices will result in horizontal intra-industry trade (IIT) categories (the quality of export products is relatively the same as the quality of imported products) and vertical IIT, where the quality of export products is higher than the quality of imported products. Vertical IIT indicates, among other things, that imported products are raw materials or semi-finished goods. At the same time, exports are final goods/consumer goods that have undergone processing and added value. Suppose the proportion of vertical IIT increases over time. In that case, it means that the exports of the observed commodity have experienced a structural change in the form of an increase in export quality. Product differentiation analysis was introduced by [33] as formula (3).

$$1-\alpha \leq \frac{\mathrm{UV}_j^x}{\mathrm{UV}_j^m} \leq 1-\alpha \qquad (3)$$

The ratio $\frac{\mathrm{UV}_j^x}{\mathrm{UV}_j^m}$ is the GL-Index, which refers to Grubel and Lloyd, who introduced it in 1975 [34]. Product differentiation is denoted by α. Traded products are considered similar (horizontal IIT) if the value per unit of exports (UV_j^x) and the value per unit of imports (UV_j^m) differ by less than α. The value of α is not uniformly determined but varies between 15% and 25%. Researchers who use α = 15% include [33], [35], and [36], while researchers who use α = 25% include [37] and [38]. This study uses α = 25%. By using the 25% threshold, the value ratio in formula (3) will result in three categories of intra-industry trade:

(i) $\frac{\mathrm{UV}_j^x}{\mathrm{UV}_j^m} \leq 0.75$, countries faced exporting low-quality commodities.

(ii) $\frac{\mathrm{UV}_j^x}{\mathrm{UV}_j^m} \geq 1.25$, countries enjoy exporting high-quality commodities (vertical IIT).

(iii) $0.75 \leq \frac{\mathrm{UV}_j^x}{\mathrm{UV}_j^m} \leq 1.25$, intra-industry trade is horizontal.

Countries that experience structural change in their export sector will experience an increase in the proportion of higher-quality exports ($\frac{\mathrm{UV}_j^x}{\mathrm{UV}_j^m} \geq 1.25$) from year to year.

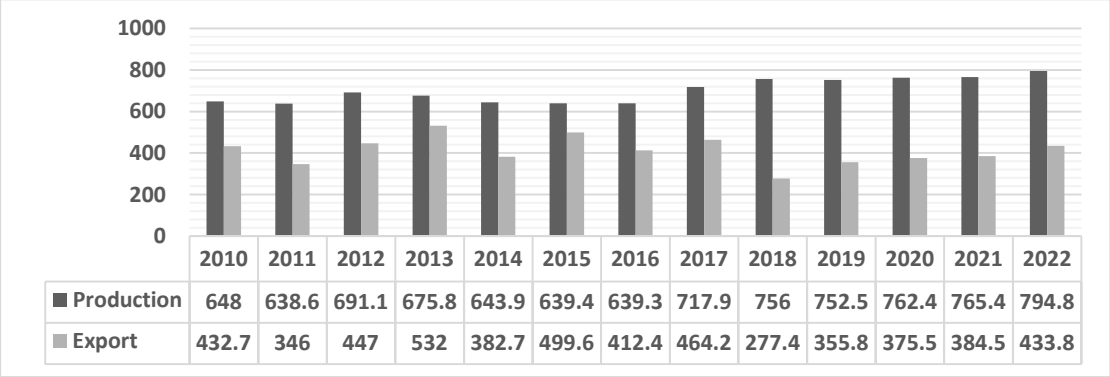
In this study, the export destination country is a source of differentiation, given that the world coffee trade pattern separates the position of high-income countries, namely European and North American countries, as exporters of roasted coffee and instant coffee, while countries with lower incomes supply coffee beans [6]. Regarding this provision, the export destination countries that provide benefits for Indonesia are those with $\frac{\mathrm{UV}_j^x}{\mathrm{UV}_j^m} \geq 1.25$, which UV_j^x is the weighted average of Indonesia's coffee import value and UV_j^m is the unit price in the export destination country in the year of observation.

3. Results and discussion

3.1. Overview of Indonesian Coffee Production and Exports

Indonesia's coffee production has shown an increasing trend since 2010. In contrast to the global production composition where Arabica is 60% and Robusta 40%, Indonesian coffee

production is dominated by Robusta (80%) while Arabica is less than 20%. In general, Arabica coffee is known to be of higher quality and therefore commands a higher market price than Robusta coffee ([14]; [39]). Indonesian Arabica coffee mainly originating from North Sumatra and Aceh is a specialty in the global market with its trademarks Gayo, Lintong, and Mandheling. Unlike Indonesian Robusta Coffee, Indonesian Arabica Coffee has a strong international reputation for high quality. Export markets for Indonesian Arabica tend to be more stable than Robusta and are dominated by developed markets in North America, Western Europe, and Northeast Asia ([14]; [40]). In contrast to other coffee-producing countries, in the last five years, Indonesia's coffee production has been consumed domestically rather than exported (figure 1).



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Production	648	638.6	691.1	675.8	643.9	639.4	639.3	717.9	756	752.5	762.4	765.4	794.8
Export	432.7	346	447	532	382.7	499.6	412.4	464.2	277.4	355.8	375.5	384.5	433.8

Figure 1. Development of Indonesian Coffee Production and Exports 2010-2022 (in 000 tons).

Various studies reveal that Indonesia produces very low productivity per hectare (e.g., [8]; [14]; [12]). The productivity of Vietnam (ranked 2nd as the world's coffee producer) is four times that of Indonesia, while China (ranked 14th) records five times the productivity. Even with Malaysia (the 48th world coffee producer), Indonesia's productivity is only 26.79% (Table 1). Indonesia relies on land area in production, not average production per hectare. The same agricultural pattern has made Indonesia the highest palm oil and rubber producer. However, the productivity of oil palm fresh fruit bunches and latex is far below Malaysia, Thailand, and Vietnam. Recently, the allocation of agricultural production in Asia has followed a labor-intensive and land-intensive pattern, with China relying on labor to produce vegetables and fruits on a small land area. In contrast, Indonesia, India, Thailand, and Malaysia rely on the land area to produce plantation and grain products such as palm oil, rubber, and rice [41]. The causes of low productivity of Indonesian coffee include (i) natural climate factors, (ii) pests and diseases, (iii) limited use of fertilizer, (iv) lack of pruning, (v) poor planting material and aging stock, (vi) shade-grown coffee (dense canopy of shade), and (vii) diversified livelihoods ([14]; [42]; [7]).

Table 1. Coffee Productivity in Major Producing Countries of the World (2020).

No.	Producing Country	Production (ton)	Area (ha)	Productivity (kg/ha)
1	Brazil	3 009 402	1 823 403	1 650.4

2	Vietnam	1 683 971	622 637	2 704.3
2	Colombia	885 120	853 700	1 036.8
4	Indonesia	760 963	1 258 032	604.9
5	Ethiopia	482 561	758 523	636.2
6	Honduras	476 345	420 957	1 131.6
7	Peru	363 291	359 508	1 010.5
8	India	319 500	416 741	766.7
9	Uganda	254 088	469 364	541.3
10	Guatemala	225 000	308 217	730.0
11	Nicaragua	174 000	180 416	964.4
12	Laos	165 888	87 817	1 889.0
13	Mexico	165 712	629 300	263.3
14	China	120 000	39 607	3 029.8
15	Costarica	84 096	93 697	897.5
Other ASEAN (Association of Southeast Asian Nations) members:				
18	The Philippines	64 044	112 024	536.0
30	Thailand	24 614	36 804	668.8
40	Myanmar	8 769	12 772	686.6
48	Malaysia	3 559	1 576	2 258.2
59	Cambodia	384	408	941.2

Source: Authors calculation according to FAO (https://fao.org/faostat/en/#data/QCL)

Table 2 shows the main world coffee exporters and the price per unit of export (US$/ton) for 2022. The information in the table supports the view that the world coffee market is asymmetric with the emergence of exporting countries that are not producing countries. Germany, Italy, and Belgium are not coffee growers but rank in the top 10 as significant exporters. If expanded to the top 20 exporters in the world, the Netherlands, the United States, Switzerland, Canada, Spain, and Poland would be included. These non-producing exporting countries generally receive a higher price per unit than the average price per unit of exports of producing countries, which indicates that the exporting countries, which are generally developed countries, import coffee beans as raw materials and re-export them after processing in a vertical IIT pattern. The United States, Germany, France, Italy, Belgium, Canada, Japan, the Netherlands, and Spain are the world's top 10 coffee importers (import to export, according to [43]. In 2023, the global coffee market generated a sales value of US$ 88.3 billion, of which US$ 11000 was enjoyed by the United States as the country with the most considerable revenue [28].

The unit price of Indonesian coffee exports is among the lowest on the world market, together with Vietnamese and Indian products, supporting the view that the quality of exports is very low, in the sense that only simple processing is directly exported (coffee bean with HS code 090111 according to the UNComtrade harmonized system). Switzerland, Canada, the United States, Italy, Poland, the Netherlands, and Germany process these intermediate goods into final products. They can sell them on the world market at three to 30 times the price (roasted coffee and roasted and decaffeinated, HS-090121 and HS-090122).

Table 2. Volume and Unit Price of Coffee Exports by Exporting Country (2022).

No.	Exporting Country	Volume (ton)	Price (US$/ton)	Producing Country Rank

1	Brazil	2 135 446	4 000	1
2	Vietnam	1 343 221	2 408	2
3	Columbia	640 575	6 390	3
4	Germany	568 704	5 967	-
5	Indonesia	437 954	2 624	4
6	Honduras	323 396	5 307	6
7	Italy	310 134	7 637	-
8	Belgium	307 273	4 778	-
9	Uganda	288 218	2 821	9
10	Ethiopia	273 804	5 527	5
11	India	271 291	2 804	8
12	Peru	237 235	5 011	7
13	Guatemala	194 021	5 752	10
14	Netherlands	164 615	6 747	-
15	Nicaragua	156 889	4 567	11
16	United States	149 653	8 014	-
17	Swizerland	109 409	31 279	-
18	Canada	84 679	10 051	-
19	Spanyol	78 903	4 865	-
20	Poland	71 438	7 184	-

Source: Authors' calculation based on UNComtrade data (https://intracen.org/resources/data-and-analysis/trade-statistics).

3.2. Structure of Indonesia's Coffee Trade

At all times Indonesia posted a surplus on the coffee commodity trade balance. In line with the fluctuating export value, as shown in Figure 1, the surplus value also shows fluctuations (Table 3).

Table 3. The Indonesian Coffee Trade Balance, 2010 - 2022 (in US$).

Year	Export	Import	Balance
2010	814311	34852	779459
2011	1036671	49119	987552
2012	1249519	117196	1132323
2013	1174044	38838	1135206
2014	1039609	46768	992841
2015	1197733	31492	1166241
2016	1008549	48473	960076
2017	1187157	33583	1153574
2018	817789	155778	662011
2019	883123	66186	816937
2020	821937	38280	783657
2021	858558	32694	825864
2022	1149168	60789	1088379

Source: Author's calculation based on UNComtrade data.

Almost all of Indonesia's coffee exports are coffee beans, processed from coffee cherries, by removing the coffee skin and packing them in dry conditions. Less than 2% of exports are in the form of further processed products such as roasted and decaffeinated coffee. The difference in selling price of coffee bean and roasted coffee, as well as roasted and decaffeinated, is very substantial, ranging from 2270 - 4354 $/ton, 8581-10,487 $/ton, and 10916 - 14247 $/ton, respectively. In the last 12 years, roasted coffee has increased Indonesia's exports and imports. Therefore, the trade balance for this type of coffee has only sometimes posted a surplus, as seen in Table 4.

All five major coffee-producing countries export coffee in the form of coffee beans (HS-090111), and all five countries have a comparative advantage in this product category. For further processed products such as roasted coffee (HS-090121), only Columbia has a comparative advantage, and Ethiopia has shown a comparative advantage in the last three years. Using the SRCA criterion, the comparative advantage of Indonesian coffee exports is always lower than that of Columbia, Ethiopia, Brazil, and Vietnam. The comparative advantages of Ethiopia, Columbia, and Brazil have been relatively stable at high levels, while Vietnam has experienced a continuous decline in competitiveness since 2014 (Figure 2).

Table 4. Comparison of Indonesia's Green Coffee and Roasted Coffee Trade Balance, 2010-2022 (in US$).

Year	Coffee Bean			Roasted Coffee		
	Export	Import	Balance	Export	Import	Balance
2010	812360	32182	780178	1233	2535	-1302
2011	1034725	45456	989269	1142	3524	-2382
2012	1243826	112973	1130853	4216	3571	645
2013	1166189	34278	1131911	7501	4493	3008
2014	1030716	41284	989432	8505	4408	4097
2015	1189550	27435	1162115	7851	3979	3872
2016	1000620	44172	956448	7346	4209	3137
2017	1175547	27315	1148232	11361	6112	5249
2018	808735	147123	661612	7812	8287	-475
2019	872355	55729	816626	9136	9876	-740
2020	809164	31478	777686	9671	6669	3002
2021	849373	25338	824035	6584	7266	-682
2022	1136296	49810	1086486	9336	10655	-1319

Source: Author's calculation using UNComtrade data.

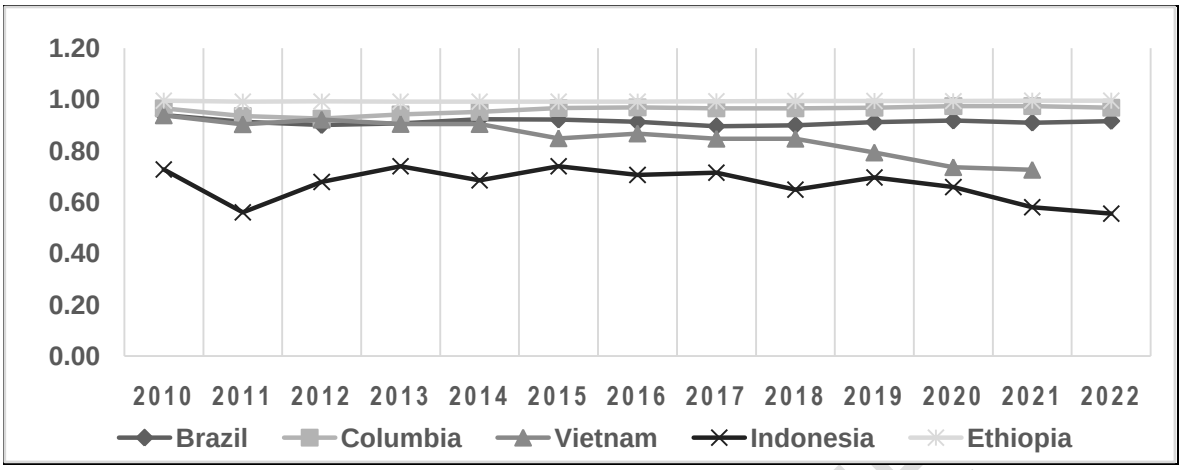


Figure 2. Comparative Advantage of Indonesian, Brazilian, Columbian, and Vietnamese Coffee Exports (SRCA Index).

Source: Author's calculation based onUNComtrade data.

Indonesia's coffee imports are beans from three countries: Vietnam, Brazil, and Timor Leste. These three countries contribute, on average, 92% of imports, with Vietnam as the leading supplier with a proportion of 65%. As for exports, the destination countries of coffee bean exports are more diverse, with the share of exports to the five main destinations being less than 50% and the ten central destination countries absorbing 70% of the export volume. By comparing the value of Indonesia's coffee bean exports to various destination countries in North America, Europe, Australia, East Asia, and ASEAN against the average import value from primary import sources, it can be observed that high GL-Index values are obtained in trade with North America and Australia and New Zealand. Exports to Europe, Arabia, and East Asia show non-uniform results (exports to South Korea always receive a GL-Index above 1.25, but to China and Japan are more often below 1.25). ASEAN is not a profitable export destination for Indonesia's coffee beans because GL-Index values are smaller than unity (Table 5).

Referring to the results that have been presented, Indonesia's coffee development potential is still tremendous both in terms of production and in terms of international trade. The productivity lag per hectare of land is still substantial at the farm level. Therefore, production can still be increased through certain aspects of cultivation by applying cropping techniques that support increased production, such as the gradual rejuvenation of old plants with new plants with productivity advantages. In addition to applying innovations in the production process, Indonesia also needs to adapt the production process to global trends, such as the emphasis on sustainability aspects in the context of the green economy ([14; [42]; [44]; [7]). In the context of replanting to replace aging stock, the composition of Arabica Coffee can be increased from the current 20% to at least balance with Robusta Coffee, given the higher selling price of Arabica Coffee in the international market ([14]; [39]; [40].

At the post-harvest level (downstream sector), the potential for developing Indonesian coffee exports can be pursued through two different aspects: (i) improving the downstream product process by processing coffee beans into roasted coffee, which requires specific technology and human resource capabilities. The value-added will be even higher if the processing of coffee beans can be increased to decaffeinated coffee, either roasted or in bean form, and (ii) selection of export markets. Coffee consumers have diverse and unique tastes.

Therefore, understanding the character of coffee in high demand in export destination countries is very critical so that the processing of coffee beans into derivative products can be tailored to the tastes of consumers willing to pay higher prices. The GL-Index value indicated that Indonesian coffee is highly favored in North America and Australia-New Zealand, less favored in ASEAN, and received different responses in Europe, Middle East, and East Asia.

Table 5. GL-Index Value of Indonesian Coffee Bean Exports to Various Destination Countries by Region.

Year	USA	Canada	Germany	Italy	UEA	Egypt	Australia	N. Zealand	Japan	China	Singapore	Malaysia
2010	1.68	2.23	1.02	0.97	1.24	0.95	1.40	2.31	1.21	1.10	0.95	0.85
2011	2.21	2.72	1.03	0.82	1.06	0.93	1.34	2.44	1.15	0.93	0.93	0.83
2012	2.19	2.95	1.06	1.03	1.21	1.00	1.48	2.92	1.31	1.03	1.63	0.94
2013	1.39	1.78	0.90	0.90	1.00	0.90	1.19	1.95	1.09	0.83	1.14	0.81
2014	2.28	2.61	1.00	0.92	1.13	0.93	1.54	2.62	1.11	0.97	1.24	0.84
2015	1.88	2.24	0.81	0.86	1.02	0.83	1.32	2.26	1.12	0.93	1.43	0.77
2016	2.24	2.78	1.18	1.03	1.33	1.09	1.83	2.83	1.37	1.30	1.25	0.96
2017	1.73	2.25	0.99	0.89	1.13	0.94	1.39	2.26	1.19	0.87	1.11	0.84
2018	2.57	3.11	1.73	1.02	1.27	1.03	2.55	3.15	1.47	1.95	1.64	0.94
2019	2.34	3.05	1.31	0.92	1.15	0.93	2.03	2.91	1.45	1.60	1.72	0.88
2020	1.82	2.44	1.14	0.80	1.03	0.83	1.14	2.29	1.17	1.51	0.97	0.75
2021	1.72	2.22	1.16	0.88	1.14	0.94	1.35	2.22	1.22	1.52	0.91	0.86
2022	1.45	2.05	0.66	0.62	0.79	0.66	1.40	1.74	0.95	0.96	0.95	0.62

Source: Authors' calculation based on UNComtrade data.

Note: A GL-Index value of ≥ 1.25 indicates that the export price in the destination country is higher than the import price of Indonesian coffee for the same product category.

4. Conclusion

The study concluded that Indonesian coffee at various stages of the supply chain has shortcomings, including (i) Indonesia's coffee production per hectare is far below the coffee productivity of the world's major coffee-producing countries, (ii) 80 percent of Indonesia's coffee production is of the Robusta variety, which is well known to be of lower quality and therefore priced below the price of arabica coffee, (iii) like other major coffee producers, Indonesia exports processed coffee beans that will become raw materials for the advanced coffee processing industry to produce roasted coffee and decaffeinated coffee, which receive enormous value-added.

It is recommended that Indonesian coffee farmers, 95% of whom are smallholders, receive guidance/counseling in cultivation techniques to increase productivity. In addition, it is necessary to replant old coffee plants by increasing the proportion of Arabica Coffee to at least equal the proportion of Robusta Coffee. At the post-harvest stage, in addition to improving processing into roasted or decaffeinated coffee, it is necessary to identify export destination countries. Export promotion should focus on countries or regions that favor Indonesian coffee and are willing to pay a higher price per unit.

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