

Original Article

An Evaluation, the Total Exports Indonesian Coffee, focuses on April Group in Several Exporting Countries

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Abstract - This study uses techniques for order preference by similarity to ideal solution (TOPSIS) combined within formation Entropy weight to examine the Total Exports Indonesian Coffee focus on April Group in Several Exporting Countries. Calculations in research and improvement ability reveal short-term and long-term performance. Exact values and intervals characterize the attribute values in the current model. A comparison and experimental analysis show the applicability, feasibility, effectiveness, and advantages of the proposed method. This study applied TOPSIS and Entropy to calculate the student's performance. The rationality of TOPSIS conferring to the standard decision theory. It forms that TOPSIS also has a built-in multi-attribute value meaning that is not revealed explicitly. Some alternatives must be considered and evaluated on many different encounter criteria in the problem of the Total Exports Indonesian Coffee focuses on April Group in Several Exporting Countries.

Keywords - Coffee, Entropy, Evaluation, Exports, Indonesian, TOPSIS.

I. INTRODUCTION

In this paper, the study is to propose methods to create and find suitable methods to create strategies for developing coffee exports from Indonesia into the international market. Further, the performance of the Indonesian coffee bean export was not satisfactory. The implied that there were problems with the competitiveness of Indonesian coffee bean export. This study was expected to come up with some views related to the problem. This study was aimed to analyze the competitiveness of Indonesian coffee bean export in international markets. Some policy implications are derived following the conclusions.

Also, this study was aimed to deliver some arguments referring to organic coffee development as an alternative export development. Data used in this study was data series ranging from 2001 to 2018 supported with some primary data.

The export data were analyzed descriptively, and the Revealed Comparative Advantage (RCA) Index was employed to analyze the competitiveness of the

Indonesian coffee bean export. The export of Indonesian coffee beans was product-oriented, not market-oriented. Further, the Indonesian coffee bean export is characterized by low quality with no premium price, the difference is that of Vietnam coffee export. Besides quality, the uncompetitive Indonesian coffee export was related to market hegemony by buyers, an emerging issue of Ochratoxin A (OTA). Contamination and high-cost economy in export. Also, the competitiveness of Indonesian coffee export was lower than those of other countries, such as Columbia, Honduras, Peru, Brazil, and Vietnam. Therefore, Indonesia still held an opportunity to develop organic coffee for export.

Finally, the objective of this research is to investigate and highlight the significance of Indonesian coffee exports. Arrange that a direct relationship exists between total coffee consumption and total coffee production in Indonesia. In order to characterize alternative tools to make decisions and policymakers need in the future prediction of coffee exports. The proposed research is significant as not only highlights the importance of TOPSIS and Entropy methods to Indonesia coffee exports but provides strategies that can create knowledge in the total production of coffee in more cost-effective and efficient ways in the future.

II. PREVIOUS STUDIES

Several studies that have addressed the issue of Indonesian Coffee Exports used several methods. Wang and Ghalih (2018)[1] said that the Indonesian government, coffee farmers, and industries should make an action plan for the future to develop coffee sectors in all aspects because the coffee market nowadays develops rapidly in over the world. It is true that contrary to expectations, this study did not find significant differences between males and females in order to buy coffee products [2].

Also, sustainability labels rely on symbolic quality to create and retain visibility in the coffee market[3]. Indonesia's coffee smallholders are thus linked to global production networks via traders with both domestic and export market orientations, and then on to branded roasting firms proximate to end markets, which ultimately govern the network[4]. Indonesia's



jump in coffee production is expected to help increase exports to approximately 9.05 million bags GBE in MY 2015/2016. Post expects Indonesian coffee imports to decline from 1.295 million bags GBE in MY 2014/2015 to 1.280 million bags GBE in MY 2015/2016, based on industry reports that soluble coffee producers will procure more local Robusta in 2015/2016[5].

Furthermore, post estimates 2016/17 exports to decline to 7.9 million bags GBE, based on low production. 2016/17 imports are expected to rise to 1.04 million bags GBE from 990 thousand bags GBE in 2015/16. The rise in imports is expected due to the decline in 2016/17 production compounded by rising Indonesian consumption[6]. Indonesia exports more than 60 percent of its products mostly in the form of green beans. Major markets include the EU, U.S., Malaysia, and Japan. Notably, shipments to Malaysia have almost doubled since 2008. Exports usually peak in June – July following the harvesting period in Southern Sumatra.

Meanwhile, post revises its Indonesian export number to 7.2 million bags GBE in MY 2016/17, reflecting 11 months of trade data (April 2016 to February 2017). Exports are more aggressive than expected, with January -February 2017 green bean exports 25 percent higher than the same period in 2016 (although export levels match Jan-Feb 215 performance). Post expects that coffee bean exports will increase to 7.3 million bags GBE in MY 2017/18, reflecting out-year production that is consistent with the current year and stable international demand for Indonesian coffee[7].

III. THE PROPOSED METHODS

This section presents the research method and details of data collection for analysis of An Evaluation the Total Exports Indonesian Coffee focus on April Group in Several Exporting Countries. To achieve the research objectives of this research, the next section presents the proposed methods to explain the concept of these days, and most decision-making problems are involved in the optimization of more than one single objective. In many cases, decision-makers are faced with various criteria, which are also in conflict with each other. Multi-Attribute Decision Makings, also called Multi-Criteria Evaluation, assume that the decision space is discrete. Although there is no optimal solution for this problem with a limited set of options, the aim is to select the best option based on multiple attributes. A technique for Order Preference by Similarity to Ideal Solution (TOPSIS)[8] method is also one of those useful multi-criteria decision-making methods for surveying issues[9] in the real-world raised by Hwang & Yoon (1981)[10] for the first time. This method was also suggested by Ghali and Rohanah (2018)[11]. There are various applications of TOPSIS adopted in many

areas of scientific societies, and there are different extensions[12] of TOPSIS, such as in this study used TOPSIS and Entropy[13].

Create a data evaluation matrix

$$D = \begin{bmatrix} x_{ij} \end{bmatrix}_{m \times n} = \begin{bmatrix} A_1 & A_2 & \dots & A_n \\ x_{11} & x_{12} & \dots & x_{1n} \\ x_{21} & x_{22} & \dots & x_{2n} \\ \vdots & \dots & \dots & \dots \\ x_{m1} & x_{m2} & \dots & x_{mn} \end{bmatrix}_{m \times n}$$

$$i = 1, 2, \dots, m, j = 1, 2, \dots, n$$

(1)

Normalization of the matrix

$$r_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^m x_{ij}^2}}$$

$$i = 1, 2, \dots, m, j = 1, 2, \dots, n$$

(2)

$$R = \begin{bmatrix} r_{ij} \end{bmatrix}_{m \times n} = \begin{bmatrix} C_1 & C_2 & \dots & C_n \\ A_1 & A_2 & \dots & A_n \\ r_{11} & r_{12} & \dots & r_{1n} \\ r_{21} & r_{22} & \dots & r_{2n} \\ \vdots & \dots & \dots & \dots \\ r_{m1} & r_{m2} & \dots & r_{mn} \end{bmatrix}_{m \times n}$$

$$i = 1, 2, \dots, m, j = 1, 2, \dots, n$$

(3)

Calculate the objective weight with Entropy

$$e_j = -\frac{1}{\ln m} \sum_{i=1}^m r_{ij} \ln r_{ij}$$

$$i = 1, 2, \dots, m, j = 1, 2, \dots, n$$

(4)

Recalculate the value of each evaluation criterion

$$W = (w_1, w_2, \dots, w_n)$$

$$w_j = \frac{1 - e_j}{\sum_{j=1}^n (1 - e_j)}$$

$$i = 1, 2, \dots, m, j = 1, 2, \dots, n$$

(5)

Weight matrix

$$v_{ij} = r_{ij} \times w_j \quad (6)$$

$$V = \begin{bmatrix} v_{ij} \end{bmatrix}_{m \times n} \\ i = 1, 2, \dots, m, j = 1, 2, \dots, n \quad (7)$$

Calculate positive and negative ideal solutions

$$V^+ = \{v_1^+, v_2^+, \dots, v_n^+\} \quad (8)$$

$$V^- = \{v_1^-, v_2^-, \dots, v_n^-\} \quad (9)$$

Calculate the distance between the sample being evaluated and the ideal positive and negative solution

$$S_i^+ = \sqrt{\sum_{j=1}^n (v_{ij} - v_j^+)^2} \\ i = 1, 2, \dots, m, j = 1, 2, \dots, n \quad (10)$$

$$S_i^- = \sqrt{\sum_{j=1}^n (v_{ij} - v_j^-)^2} \\ i = 1, 2, \dots, m, j = 1, 2, \dots, n \quad (11)$$

Calculate the relative ability indicator value

$$C_i = \frac{S_i^-}{S_i^+ + S_i^-} \quad (12)$$

Sorting (Ranking)

According to the relative distance values of each C_i evaluation sample, it is the relative pros and cons of each evaluation sample after evaluation. $0 < C_i < 1$, C_i the closer the value becomes 1, the closer the evaluation sample is to a positive ideal solution; it also means that under the existing evaluation criteria, illustration evaluation is the best evaluation sample relative to other evaluation samples. Conversely, if C_i values are further separated from each other, it means

that the evaluation sample is a poor evaluation sample, and there is sufficient room for improvement.

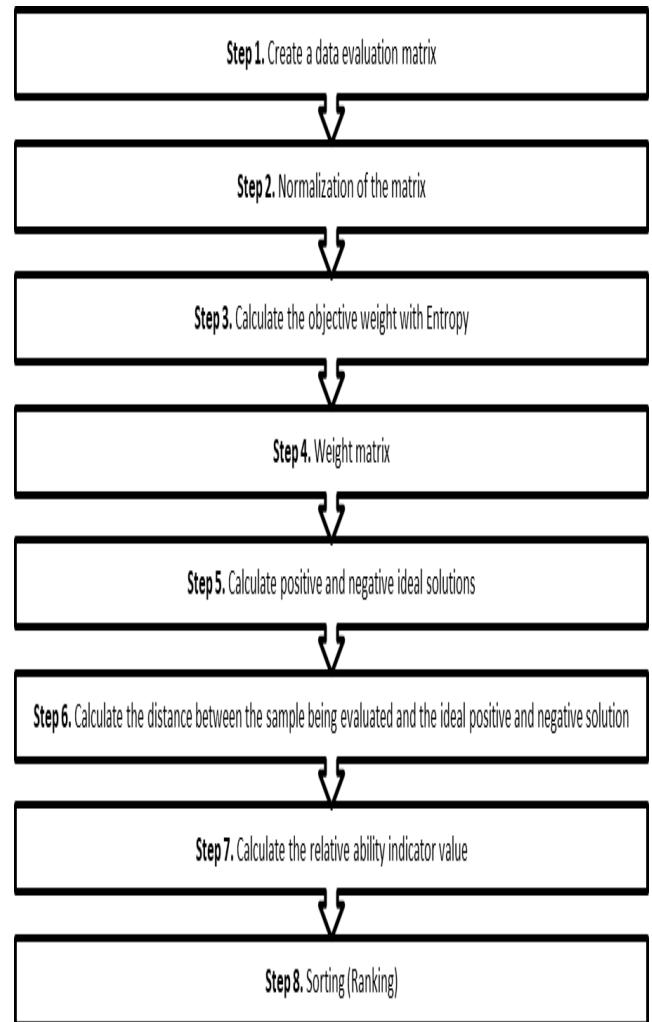


Fig. 1 Proposed conceptual framework

I. DATA ANALYSIS

Tabel 1. Normalized student performance matrix

April group	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Angola	10,69	11,64	13,01	4,77	4,97	5,10	5,63	7,61	3,42	4,97	8,72	7,79	4,94	9,41	10,52	14,83	5,01
Bolivia	63,52	89,17	64,82	109,81	68,97	104,43	72,53	75,42	82,48	69,72	82,84	54,78	67,91	46,38	29,22	20,98	25,31
Brazil	23767,10	29612,63	24909,41	27468,15	25077,98	28485,73	28044,46	30291,52	30254,81	34054,41	32148,83	29285,23	32761,08	36875,98	36927,64	33466,76	30483,17
Burundi	216,55	431,06	323,69	477,02	232,16	372,73	276,85	351,03	172,94	350,72	202,13	405,96	159,22	245,55	274,10	246,79	168,80
Ecuador	712,85	585,22	627,79	761,44	1001,30	1025,02	961,70	858,85	1156,28	1273,98	1553,11	1578,40	1209,55	1089,01	839,49	889,88	643,57
Indonesia	5173,14	4280,46	4821,08	5822,44	6794,96	4769,67	4417,56	5667,35	7989,67	5647,51	3644,92	8970,04	8700,95	6679,28	7985,48	6891,03	7761,32
Madagascar	74,44	194,29	122,25	85,44	123,48	131,43	155,50	149,69	44,96	88,72	134,85	89,71	174,48	111,45	55,21	60,82	56,69
Malawi	59,39	43,46	47,16	19,62	21,42	16,66	19,81	19,75	15,92	15,93	24,83	21,83	26,79	23,71	20,20	18,52	10,74
Pap ua New Guinea	1073,17	1076,49	1152,09	1010,69	1253,41	811,20	969,84	1063,65	1048,99	880,09	1417,62	714,78	833,32	795,64	710,18	1169,14	731,94
Paraguay	1,60	10,05	37,73	10,24	23,24	15,75	24,63	0,02	0,02	0,20	0,02	0,01	0,01	0,07	1,00	0,01	0,00
Peru	2638,11	2838,32	2479,99	3305,16	2271,83	4113,06	2657,93	3823,26	2999,09	3831,82	5053,53	3928,05	3878,24	2443,23	3063,55	3972,88	4029,61
Rwanda	293,51	308,42	267,38	457,69	276,01	393,01	223,04	356,73	266,94	327,92	250,07	260,56	256,73	237,34	291,63	230,09	243,58
Timor-Leste	32,85	36,81	41,82	16,59	23,52	46,21	36,30	47,69	46,91	59,61	46,86	60,26	79,73	110,43	58,67	81,53	72,81
Zimbabwe	117,04	106,12	87,65	116,31	61,93	46,15	32,24	20,25	17,37	6,09	4,86	3,32	4,64	11,01	10,28	11,12	2,39

Tabel 2. Objective value with Entropy

April group	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Angola	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Bolivia	-0,02	-0,02	-0,02	-0,02	-0,02	-0,02	-0,02	-0,01	-0,02	-0,01	-0,02	-0,01	-0,01	-0,01	-0,01	0,00	-0,01
Brazil	-0,03	-0,02	-0,02	-0,03	-0,04	-0,02	-0,02	-0,03	-0,04	-0,02	-0,02	-0,05	-0,04	-0,02	-0,03	-0,03	-0,04
Burundi	-0,04	-0,06	-0,06	-0,07	-0,04	-0,06	-0,04	-0,05	-0,03	-0,05	-0,03	-0,06	-0,03	-0,03	-0,04	-0,04	-0,03
Ecuador	-0,10	-0,08	-0,09	-0,10	-0,12	-0,12	-0,11	-0,10	-0,12	-0,12	-0,14	-0,15	-0,12	-0,10	-0,08	-0,09	-0,08
Indonesia	-0,33	-0,28	-0,31	-0,33	-0,35	-0,30	-0,29	-0,31	-0,35	-0,30	-0,24	-0,36	-0,35	-0,31	-0,33	-0,32	-0,34
Madagascar	-0,02	-0,03	-0,03	-0,02	-0,03	-0,02	-0,03	-0,03	-0,01	-0,02	-0,02	-0,02	-0,03	-0,02	-0,01	-0,01	-0,01
Malawi	-0,01	-0,01	-0,01	-0,01	-0,01	0,00	-0,01	0,00	0,00	0,00	-0,01	-0,01	-0,01	0,00	0,00	0,00	0,00
Papira New Guinea	-0,14	-0,12	-0,14	-0,12	-0,15	-0,10	-0,11	-0,12	-0,11	-0,09	-0,14	-0,09	-0,09	-0,08	-0,07	-0,11	-0,09
Paraguay	0,00	0,00	-0,01	0,00	-0,01	0,00	-0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Peru	-0,24	-0,22	-0,23	-0,25	-0,21	-0,28	-0,22	-0,26	-0,22	-0,24	-0,29	-0,26	-0,25	-0,18	-0,20	-0,25	-0,26
Rwanda	-0,05	-0,05	-0,05	-0,07	-0,05	-0,06	-0,04	-0,05	-0,04	-0,04	-0,04	-0,04	-0,04	-0,03	-0,04	-0,03	-0,04
Timor-Leste	-0,01	-0,01	-0,01	0,00	-0,01	-0,01	-0,01	-0,01	-0,01	-0,01	-0,01	-0,01	-0,01	-0,02	-0,01	-0,01	-0,01
Zimbabwe	-0,03	-0,02	-0,02	-0,02	-0,01	-0,01	-0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00

Tabel 3. Positive and negative ideal solutions

	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
V_j^+	0,05	0,06	0,06	0,05	0,05	0,06	0,06	0,06	0,06	0,06	0,06	0,05	0,06	0,06	0,06	0,06	0,06
V_j^-	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00

Table 4. Ranking

April group	Calculation	Ranking
Angola	1,00	13
Bolivia	1,00	9
Brazil	0,00	1
Burundi	0,99	6
Ecuador	0,97	5
Indonesia	0,79	2
Madagascar	1,00	8
Malawi	1,00	11
Papua New Guinea	0,97	4
Paraguay	1,00	12
Peru	0,89	3
Rwanda	0,99	7
Timor-Leste	1,00	10
Zimbabwe	1,00	13

V. CONCLUSION

The application of a variety of decision criteria approaches to evaluating lecturer performance discussed. The results obtained from the two Techniques for Preference by Similarity to Ideal Solution (TOPSIS) and Entropy methods are reliable techniques for prioritizing alternatives to ideal solutions such that the chosen alternative must have the shortest distance from the ideal solution and distance the longest of dysfunctional solutions. Meanwhile, the basis of these methods is different; the difference in the final results of the evaluation is justified. Some alternatives must be considered and evaluated on many different encounter criteria in the problem of education management, which leads to a broad range of subjective or ambiguous data from the results.

Consequently, an adequate evaluation approach is fundamental to improving the quality of decisions. Recently, some more significant exporters have sought to short-circuit the established value chain by giving farmers, and village collectors access to mobile applications on their smartphones that allow them to directly calculate the discounted price for their beans, sometimes even supplier the smartphones. With the technology farmers and villages, collectors can see real-time prices, make calculations for discounts based on dust, husks, foreign material, and moisture and potentially shop around to receive a better price for their crop. Some companies have even set up temporary buying stations for farmers to bring in their beans and circumvent the entire value chain.

This disruption has not been well-received by agents, district collectors, and some village and local collectors whose livelihoods were threatened. While it does provide the opportunity for farmers to fetch a better price, it also may prove disadvantageous in

the long term as farmers often rely on village collectors for financing and inputs throughout the year. Larger companies are unlikely and probably unable to fill such a role. While it remains to be seen if the short-term profit may come at the expense of a more significant loss during trying times, the use of technology is likely to continue expanding. Industry sources suggest that 10-15 percent of Robusta beans in Southern Sumatra may already sell outside of the traditional value chain. Some policy implications that emerged from the discussion were as follows: (1) The Government should facilitate market development through the provisions of market information and export incentives. (2) The Government should develop and apply the national standard of coffee bean referring to that of international, as well as, improve processing technology equipment is in the farm level for both wet and dry processes. (3) Besides improving quality, the improvement of competitiveness should also be carried out by reducing up to the elimination of operational costs before and in exporting ports through the provisions of fiscal and monetary incentives (taxes and interest rates). (4) The development of coffee organic started with the socialization of some aspects related to the standard and implementation of farming, processing, and trade. The Government should facilitate producers and exporters of organic coffee with the provisions of market information and incentives.

This study presents a scientific framework for assessing the management of the Total Exports Indonesian Coffee focuses on April Group in Several Exporting Countries. Although the model was developed and tested for use in lecturer performance, it can use with little modification in other decision-making problems in Indonesian Coffee. Also, mathematical models are combined with the proposed model. The improvement suggested a method and is one direction in future research.

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APPENDIX

LIST OF INDONESIAN COFFEE EXPORTERS

KARYA MANDIRI, CV Jl. Ikan Mas No. 10, Kel. Kangkung - 35000 Lampung Phone : (62-721) 484309 Fax : (62-721) 486448 Email : musken@indo.net.id Produk : Cocoa Beans, Whole Or Broken, Raw Or Roasted, Coffee Beans

MEGAHPUTRA SEJAHTERA, PT Jl. Gunung Latimojong No. 131 - 90141 Sulawesi Selatan Phone : (62-411) 3617327 Fax : (62-411) 3618438 Email : mpsejahtera@yahoo.com, mpseja@indosat.net.id Produk : Arabica Coffee, Cocoa Beans, Whole Or Broken, Raw Or Roasted

BINA JASA MULIA, CV Jl. Gunung Latimojong No. 96/131 - 90141 Sulawesi Selatan Phone: (62-411) 317327 Fax : (62-411) 318438, 318834 Email : mpseja@indosat.net.id Produk : Arabica Coffee, Robusta Coffee

ARVIS SANADA, CV Jl. Sisingamangaraja No. 39 A, Simpang Limun - 20219 Sumatera Utara Phone : (62-61) 77484870, HP : (62-811) 615940 Fax : (62-61) 7864982, 7870450 Email : sadarsah@arviscoffee-sumatra.com, ira@arviscoffee-sumatra.com Produk : Coffee Beans

BINTANG SORAYYA, UD Jl. Mesjid Agung No. 8 Sulawesi Tengah Phone: (62-451) 428588 Email: sysorayamad@gmail.com Produk: Coffee, Ginger

AYAM MERAK, PT Jl. Pluit Raya No. 195-197 - 14440 D. K. I. Jakarta Phone: (62-21) 6690002 (Hunting) Fax: (62-21) 6693688 Email: ayamerak@rad.net.id, info@ayam-merak.com Website : www.ayammerak.com Produk : Coffee Beans, Robusta Coffee

ASIA PASIFIK KOPI, PT Jl. Kelapa Sawit Raya Blok BD 12 No. 31, Gading Serpong - 15810 Banten Phone: (62-21) 5463327, HP: (62-813) 97971556 Fax : (62-21) 5461935 Email : hanafi@asiapacificcoffee.com Website : www.asiapacificcoffee.com Produk : Coffee

EXCELSO MULTIRASA, PT Jl. KH Hasyim Ashari 125, Pusat Niaga Roxy Mas Bl B-1/38-39 Cideng - Gambir - 10150 D. K. I. Jakarta Phone: (62-21) 6326352, 6326354, 6326605, 6326631 Fax : (62-21) 6326605, 6326631 Email : pranoto_soenarto@yahoo.co.id, hrd@excelso.co.id Website : www.excelso-coffee.com Produk : Coffee

KAPAL API GLOBAL, PT The Plaza Office Tower Lt. 22 Unit A-D, Jl. MH. Thamrin Kav. 28-30 - 10350 D. K. I. Jakarta Phone : (62-21) 29922288 Fax : (62-21) 29922282 Email : info@kapalapi.co.id Website : www.kapalapi.co.id Produk: Extracts, Essences, And Concentrates Of Coffee

SUMATRA COFFEE LUWAK, PT Jl. Periuk No. 49 - 20118 Sumatera Utara Phone: (62-61) 4510816 Fax : (62-61) 4510816 Email : info@sumatracooffeeluwak.com Website : www.sumatracooffeeluwak.com Produk : Coffee

CIPTA USAHA, CV Jl. Kenari No. 15 - 24315 Nangroe Aceh Darussalam Phone : (62-61) 7367325 Fax : (62-61) 7360994 Email : putrarinimbun@yahoo.com Produk : Coffee Beans

COFFINDO, PT Jl. Selamat No. 1-B, Kel. Binjai - Kec. Medan Denai - 20352 Sumatera Utara Phone : (62-61) 4552455 Fax : (62-61) 4565455 Email : irfan@coffindo.com, irfanwar3@yahoo.com, office@coffindo.com, exim@coffindo.com Website : www.coffindo.com Produk : Arabica Coffee, Coffee Beans, Robusta Coffee

CITRABUANA TUNGGAL PERKASA, PT Jl. Manyar Kertoarjo 3 No. 12 - 60285 Jawa Timur Phone : (62-31) 5936111, 5936382 Fax : (62-31) 5461867 Email : hutama_sugandhi@anekacoffee.com Produk : Arabica Coffee, Robusta Coffee

ANEKA COFFEE INDUSTRY, PT Plaza Central Lt. 20, Jl. Jend. Sudirman Kav. 47 - 12930 D. K. I. Jakarta Phone : (62-21) 57904488 (Hunting), 57904478, 57904515-17 Fax : (62-21) 57904483, 57904484, 52880084 Email: info@anekacoffee.com, acisby@gmail.com, mario_arsanto@anekacoffee.com Website: www.anekacoffee.com Produk: Extracts, Essences And Concentrates Of Coffee

BUMI KARYA SENTOSA, PT Jl. Kali Mati Kulon No. 35 - 60162 Jawa Timur Phone : (62-31) 3523940, 3522495, 3575173 Fax : (62-31) 3537184 Email : bumi_ks@hotmail.com Produk : Arabica Coffee, Coffee Beans, Robusta Coffee