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Sustainability Certification and Economic Performance An Analysis of Coffee Marketing Channels in Indonesia

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Abstract
It is generally assumed that sustainability certifications in the coffee sector may shorten the coffee chain, reduce transaction costs and market risks, improve market access, enhance knowledge of good agriculture practices, and in that way improve farmers' livelihood. A fast-growing amount of academic literature examines the impact of sustainability certification on economic performance, but little is known about the influence of different types of marketing channels on efficiency and equity. In this paper we hypothesize that the type of channel is an important structural factor influencing the performance of the coffee production, independent from the fact whether it is certified or conventional coffee. This paper analyzes the performances of different types of coffee channels in terms of efficiency and equity. Efficiency is operationalized by looking at costs, profits and lead times, whereas equity is measured in terms of the division of marketing and profit margins over the actors in the channels. Our results indicate that certified channels are more efficient than non-certified channels although the most efficient channels are not necessarily the most equitable ones. Channels that perform relatively well are either certified or mixed: none of the conventional channels performed well. It is however questionable whether this positive performance results from the certification as the channel's length and the domestic demand for high quality coffee seem to be more important explanations behind performance.
Keywords*:* coffee certification; marketing channels; performance; efficiency; equity

1. Introduction

A clear trend in the governance of agricultural commodity value chains is the increase of voluntary private sustainability standards and certifications (Bitzer & Glasbergen, 2015; Meybeck & Susan, 2014; Henson & Humphrey, 2009). In the coffee sector, sustainability standards like Fair Trade, organic, Rainforest Alliance, 4C, bird friendly and others have become significant players in the market (Ibnu, Offermans, & Glasbergen, 2015; Reinecke & Von Hagen, 2012; Bitzer, Francken, & Glasbergen, 2008). These sustainability certifications compete among each other for a market share, whilst demand for conventional coffee is relatively stagnant in mature markets (Reinecke & Von Hagen, 2012; Kodoma, 2009; Ponte, 2004).

Statistics on the global annual sales of sustainable coffee are still difficult to interpret. First, because coffee can be certified under more than one sustainability standard, yet counted separately (and therefore sometimes double) in each firm's total numbers of sold certified coffee. Second, because coffee can be produced as sustainable, but end up being sold through conventional channels. It is however estimated that 20%-25% of the global coffee production is certified under a sustainability standard in 2015. According to ITC (International Trade Centre, 2011), the share of sustainable coffee consumption compared to the total coffee consumption is rather strong in the Netherlands (40%), the United States (16%), Denmark (10%), Sweden (10%), Norway (more than 10%), and Germany (5%). The demand for certified coffee is also growing in emerging markets such as China, the Republic Korea, Brazil and India (Potts, Matthew, Ann, Gabriel, Maxine, & Vivek. 2014; International trade Centre, 2011).

Certified products have become fast growing niche markets, which may even lead to changes in the mainstream market (Panhuysen & Joost, 2014; Green America, 2013; International Trade Centre, 2011). Leading multinational companies in the global coffee market, such as Nestle, Kraft, Sara Lee, Smuckers, Strauss, Starbucks and Tchibo have committed to offering sustainable coffee to consumers by establishing purchasing targets for sustainable coffee (Bamber et al., 2014; Panhuysen, S. & Joost P, 2014). For example, Nestle targets 90,000 tons of Nescafe Coffee to be certified by Rainforest Alliance by 2020 (www. Nestle.de), Starbucks and Kraft announced to make all of their coffee sustainably certified (Panhuysen, S. & Joost P, 2014), while Sara Lee targets more than 20% of their coffee to be certified by 2015 (www.saralee.com).

Non-governmental organizations (NGOs) play an important role in standard setting, such as in agenda

setting, creating and developing standards, policy implementation, catalyzing consumer influence and demand for such systems, and engaging with the industry to build stronger markets for certified products (Bitzer, 2012; Steering Committee of the State-of-Knowledge Assessment of Standards and Certification, 2012). Certifications also assist consumers in selecting products with claims of a better environmental and social performance (Oosterveer, Rossing, Hendriksen, & Voerman 2014). Moreover, consumers are assumed to be willing to pay more for products from companies that are committed to positive social and environmental impacts (Yang, Shang-Ho, Mupandawana, & Liu, 2012; De Pelsmacker, Driesen, & Rayp, 2005).

Research on the effects or impacts of coffee certification shows ambiguous results (Ibnu et al., 2015; Stellmacher & Ulrike, 2011). Some authors attribute positive effects to certification (Panneerselvam & Hermansen, 2011; Goldberger, 2008; Bakewell-Stone, 2008; Eyhorn, Ramakhrisnan, & Mader, 2007) and suggest that overall efficiency gains (Valkila, 2009) as well as a more equitable redistribution of income and profits is possible, which improve the livelihood of farmers (Dragusanu, Raluca, Giovannucci, & Nunn, 2014; CIDIN, 2012; Ruben & Zuniga, 2011). More critical authors express the view that certification cannot change the structural inequalities involved in the global coffee trade as it cannot solve problems related to poverty, such as low yield levels, low educational levels, and farmers' undeveloped entrepreneurial skills (Ruben & Hoebink P. 2015; Paschall, 2013; Beuchelt & Zeller, 2009; Blackmore & James, 2012) express a more dynamic perspective in which they refer to certification as a learning process to achieve economies of scale and lower transaction costs.

This paper connects to the positive expectations of certification, particularly the assumption that participation in certifications shortens the coffee chain which may positively relate to the economic performance of the sector. However, while most research compares (types of) certified coffee with conventional coffee, we argue that this categorization is still a very rough one. What is neglected is that the coffee sector comprises many actors in various relationships among them. These so-called marketing or distribution channels connect the local producer, via intermediaries, to ultimately the consumer (Saremi & Seydeh, 2014; Lopoyetum, 2014; Shumeta, Urgessa, & Kebebew, 2012).

In this paper we hypothesize that the type of channel is an important structural factor influencing the performance of the coffee production, independent from the fact whether it deals with certified or conventional coffee. This implies that, in this paper, we question whether certified marketing channels are essentially different from conventional channels in terms of their performance.

We operationalize the concept of performance in efficiency and equity indicators (Nzima, Joseph, & Bonnet, 2014; Shumeta et. al, 2012). A marketing channel is regarded more efficient than another channel when the movement of goods from producers to consumers is made at lower costs, with a higher profit, and in a shorter lead time (Viere, Jan, Stefan, 2011. Ngwainbi, 2008). The concept of equity refers to the distribution of benefits among actors in the channel; a more even distribution of rents characterizes a more equitable channel. We adapted the equity model proposed by Shively, Jagger, Sseserunkuuma, Arinaitwe, & Chibwana (2010), Consoli (2004); Coughlan, Anne, Anderson, Stern, Louis, Ansary, & Adeli (2002) to measure the division of marketing margins and profit margins over the respective actors in the coffee marketing channels.

In the following section we first introduce our research, followed by a description of our methodology. Next, we will first localize different coffee channels, after which we will further analyze the performance of the most dominant channels in terms of efficiency and equity indicators before we will get to our conclusions.

2. Research field

Our research was conducted in Indonesia because most research on the impacts of coffee certification is performed in Latin America and Africa whereas Indonesia is the third largest coffee producer in the world (Mafusire, Salami, Kamara, & Lawson, 2010; Hall Hill, 2000) and the second world's largest exporter of Robusta coffee (Wahyudi & Jati, 2012). Our study encompassed 234 questionnaire respondents in the provinces of Java and Sumatera between September 2013 and January 2014. The choice for these areas follows from their importance in the Indonesian coffee production as they cover 85% of the total Indonesian coffee production (Indonesian Agricultural Ministry, 2014). Besides, the choice for these areas guaranteed the inclusion of actors in Robusta marketing channels (e.g. central Java and Lampung) and Arabica market channels (e.g. Central Aceh and North Sumatera) as well as the inclusion of conventional and certified actors (4C, Rainforest Alliance, UTZ certified, Fairtrade, Organic USDA, CAFÉ Practices and bird friendly) (see table 1). The questionnaire included questions about costs, direct economic benefits and network relationships.

Table 1: Overview of respondents in the questionnaire

	Robusta	Arabica
Smallholder farmers | certified	114 |77	51 |39
Collector traders | certified	24 |8	21 |9
Exporters | certified	5 |4	7 | 5
Roasters | certified	7 |2	5 | 4

Table 2: Employed method per subtopic

Topic	Sub topic	Method
Localization of Indonesian coffee channels	• Defining the different channels • Explaining the choice for participation in one or more channels • Explaining the existence of many different coffee channels • Implications of the existence of many coffee channels	• Questionnaire • Interview • Interview • Interview
Performance of (different actors in) Indonesian coffee channels	• Efficiency - Costs - Profit margin - Lead time • Equity - Market margin share - Profit share margin	• Questionnaire - verified by interviews • Questionnaire – verified by interview

We interviewed the respondents personally and in the evenings after they had finished their work. During these interviews we filled out a questionnaire about the performance of each actor. The response rate among farmers was very high, around 95 %. Some farmers did not want to participate in our study because they were tired or had other obligations. We employed random sampling techniques to interview traders in the market and snowball sampling techniques to contact Indonesian-based roasters. For the exporters, we contacted the 40 most important Indonesian exporters (see www. aeki-aice.org). Many exporters did not want to participate in our study due to time constraints. The relatively small number of respondents in this study, especially regarding the exporters, may raise questions regarding the representativity of the study. Therefore we decided to also conduct interviews with 43 respondents in Lampung, Central Java, North Sumatera, Central Aceh, DKI Jakarta and South Sulawesi. These interviews took place between October 2014 and February 2015. The respondents consisted of farmers, traders, cooperative staff, exporters, roasters, policy makers, scientists and researchers (see table 3). These interviews were used to verify the data resulting from the questionnaires and to gain more insight into the structure of the different Indonesian coffee channels. To that end, we used open-ended questions about the reasons behind the existence of many Indonesian coffee channels, the implications of this plurality in channels and the motivations behind actor's choices for (a) particular channel(s).

Table 3: Actors interviewed

Actor	Number of interviews
Farmers	8
Collector Traders	9
Large Traders	8
Cooperative	4
Exporters	5
Roasters	3
Policy makers	2
Scientists	4

3. Methodological framework

The theoretical framework we use and which forms the fundament of our method is that of (global) value chain analysis as developed by Kaplinsky & Morris (2001). The methodological aspects of applying this framework are described below.

3.1 Localization of channels.

To localize the coffee channels, we included questions in our questionnaire about network relationships. More specifically we asked every respondent from which actor(s) they buy their coffee and to which actor(s) they sell it again. This allowed us to identify a large number of coffee channels by simply connecting buyers and sellers in a diagram. Given the large amount of coffee channels in Indonesia, we decided to only include the most dominant channels in our analysis. To distinguish between dominant and non-dominant channels we used two criteria: the volume of coffee flowing through the channel and the number of farmers involved in the channel. We selected those channels that cover an equal or higher volume of coffee (in kilograms) compared to the average volume of coffee in all channels, and that cover at least an average number of farmers.

3.2 Performance of channels – efficiency.

For each selected channel we measured the economic performance. To this end, we adopted a three-step approach. First we calculated each channel's efficiency by calculating i) the total unit costs of all actors in each channel, ii) the profit margins and iii) the lead time from producer (e.g. farmer) to the roaster or exporter (dependent on the channel and the question whether the coffee will be roasted in Indonesia and/or exported abroad).

Related to costs, we first developed an initial list of cost items for each actor. This list was verified and adapted through interviews with the different actors before presenting it to our questionnaire respondents. The final lists of farmer's costs covered costs for buying chemical and organic fertilizers, agricultural equipment, transportation, hired labor, and miscellaneous costs. Trader's costs cover expenses for handling the coffee beans, transportation, storage, grading, drying, depreciation of costs, and miscellaneous issues. Exporters have to pay for handling, storing, grading, drying, and transporting the coffee and make additional costs for money depreciation, certification (only for certified exporters), overhead, and miscellaneous issues. Roasters' costs relate to processing (roasting) coffee, packaging, marketing, distribution of coffee, depreciation of money, overhead, and miscellaneous issues.

As we also asked questions about the volume (in kilograms) of coffee that each actor sold we were able to calculate the unit costs (in Rupiah per kilogram of coffee). We present units costs rather than total costs to equalize the measurement among actors with differences in the volume of coffee that is being sold. By adopting this procedure we can compare the unit costs between actors in different channels, and the total unit costs of each channel.

In the aforementioned questionnaires we also asked the respondents to indicate the annual average selling prices (in Rupiah per kilogram of coffee) and the annual average buying prices (again in Rupiah per kilogram of coffee). This information was used to calculate the profit margins for each actor through the following formula:

Profit Margin = (SP-BP) –C

Where SP is the annual average annual selling price (in Rupiah per kilogram); BP the annual average buying price (Rupiah per kilogram) and C the unit costs (in Rupiah per kilogram). As the farmers do not buy a ready-to-buy package of a coffee product, BP in their case also refers to the cost of production. In some cases, the respondents could not answer our questions based on annual sales or purchases. In cases this occurred, we asked them for monthly or bi-weekly purchases and sales and translated these numbers to annual scores. Data are systematically checked and verified through the interviews.

The lead time in each channel was measured in the number of days between picking the coffee beans by farmers (or labor hired by the farmers) and delivering the coffee to customers by the exporter or to the coffee delivery by the roaster. We asked each actor about the average number of days between purchasing the coffee and selling it again. The most efficient channels are those in which the actors all together have relatively low unit costs; relatively high profit margins; and where the lead time is relatively short.

3.3 Performance of channels – equity.

The second step in our performance analysis consisted of analyzing the equity of different channels by measuring the marketing margin share and the profit margin share for each actor. The difference between marketing margin and profit margin is that the latter also considers the unit costs. The marketing margin share was calculated through the following formula:

$$\text{Marketing margin share} = \frac{\text{MM}}{\text{TMM}} \text{x} 100$$

Where MM refers to the price differential between selling price (SP) and buying price (BP) for each actor and TMM refers to the total marketing margin in every channel. For the farmers, the buying prices refer to the investment costs for growing and picking 1 kilogram of coffee beans, whereas the selling price of the roaster refers to the processed coffee resulting from 1 kilogram beans. In addition, the profit margin share was calculated through the following formula:

$$\text{Profit margin share} = \frac{\text{PM}}{\text{TPM}} \text{x} 100$$

Where PM refers to the earlier described profit margin for each actor and TPM to the total profit margin in a channel. A channel can be considered equitable if marketing margins and profit margins are relatively equally distributed among actors in the channel. The equality of the distribution was measured based on the sum of differences between each actor's MMs and PMS compared to the theoretically most equitable distribution of MMs and PMS (100%/ the total number of actors in the channel). The most equitable coffee channel has the lowest overall deviations.

3.4 Performance of channels – combining efficiency and equity

The third step in our analysis determined the best performing coffee channels. We considered a channel to perform well if it scored better than average on both the efficiency and equity indicators. If it scores worse than average on

both indicators, we evaluate the respective channel as performing relatively poorly. For the efficiency indicator, to determine whether a channel scores better than average, we used the criteria that at least two out of the three aspects (e.g. costs, profit or lead time) should score better than average; for equity both the deviations from MMs and PMS had to score below average.

4. Localization of Indonesian coffee channels

In our study areas we identified 42 coffee marketing channels; 17 channels covering Robusta coffee and 25 covering Arabica coffee (see Annex 1). Of the 42 channels, seven channels can be classified as certified marketing channels which implies that these channels only cover the trade in certified coffee products. Nine conventional channels only exist of conventional actors trading conventional coffee. More than a half of the identified channels (26 in total) are so-called mixed channels where certified coffee penetrates the conventional market or the other way round (see figure 1). Certified coffee mostly enters the conventional market at the moment it is sold by the farmers to traders, or from traders to middlemen. Certified farmers sometimes prefer to sell their beans to conventional traders as these traders directly pay the beans in cash. When certified farmers sell their beans to certified traders they have to wait for their money till the exporter has set the price based on the quality of the coffee beans (see Astuti et al. , submitted), which may take up to one week. Another reason for selling certified beans to conventional traders is that these traders provide advance loans to cover production costs, under the prerequisite of purchasing a specific volume of coffee beans from the certified farmers in the future. Sometimes, the quality of certified coffee beans does not meet the requirements of the certified market. In those cases we observed certified traders selling these beans to middlemen in the conventional market. In 10 mixed channels we observed the penetration of conventional coffee into the certified market when conventional farmers sold beans to certified traders, or when certified exporters purchased conventional coffee beans from middlemen or traders to mix it with certified coffee. These exporters explained that the supplementation of certified coffee with conventional coffee is necessary to fulfill the market demand, which has grown significantly due to upcoming coffee markets in Asian and Arabic countries (particularly Korea and Japan). This did not only result in mixed coffee being exported to these upcoming coffee markets, but also in mixed coffee being sold as purely certified coffee to Western markets. There were no significant differences in the number of mixed channels (see Annex 2) for Arabica coffee (53%) and Robusta (59%).

In most coffee channels, coffee flows from farmers to traders, sometimes via middlemen to either roasters or exporters. Roasters generally process coffee for the domestic Indonesian market, whereas the exporters export the coffee beans to roasters in Europe, the United States, and several Asian countries. These international roasters were not part of our study. Certified channels are generally shorter in terms of involved actors compared to conventional channels, which mainly results from the absence of middlemen. The average annual volume of coffee flowing through each channel equals 4,157 kilos (see table 4). Here we however observe large differences between Robusta channels, with an annual average of 6,956 kilos and Arabica channels with an annual average of 2,255 kilos. The volume differences among the channels are also large and vary from 524 kilograms (channel 36) up to 55,526 kilograms in channel 1 (see Annex 1 and Table 4 for an overview). Further, the number of involved farmers varies substantially over the channels and ranges from 1 farmer up till 54 farmers, with an average of almost 4 farmers per channel. Actors, including farmers, can be involved in different channels (1-4 in the case of our study, with an average of 2, see Figure 1). This mostly implies that farmers sell their coffee to the same trader(s), but that the channel diversifies in a later stage in the commodity chain. Figure 1 shows that 55% of the total overall coffee is sold from certified farmers to certified traders; 6% from conventional farmers to certified traders; 24% from conventional farmers to conventional traders and 15% from certified farmers to conventional traders. We observe a pattern wherein certified actors sell a higher proportion of their coffee to other certified actors compared to conventional actors and vice versa.

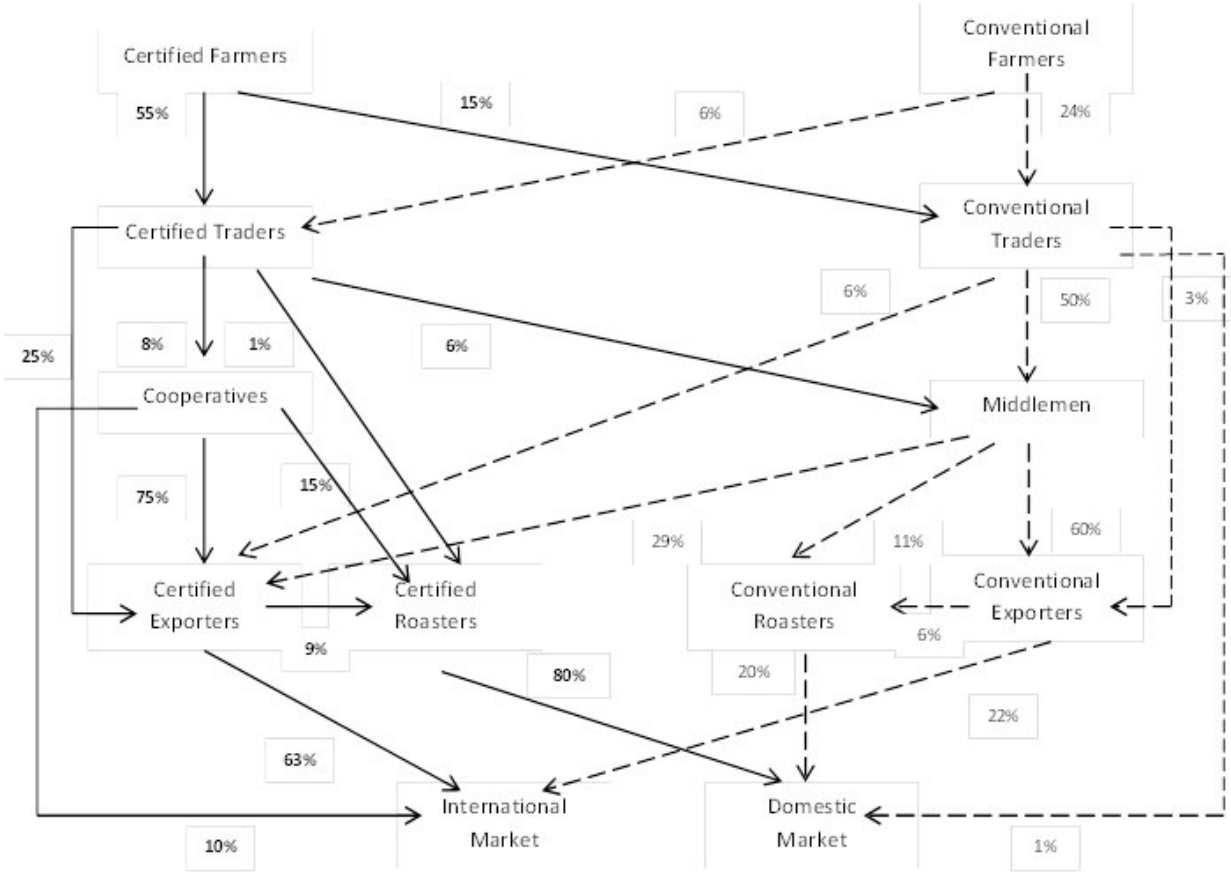


Figure 1. Coffee Marketing Channels in Indonesia. The numbers represent the relative volumes of coffee in every horizontal layer of the product chain.

We can explain the existence of many coffee channels in Indonesia by the absence of formal contracts and agreements among actors, and the subsequent existence of many personal, often verbal agreements. These agreements mostly result from strong social ties, trust and a shared cultural identity and the fact that both certified and conventional actors experience huge freedom to sell and buy coffee to and from actors they wish. Even if certification goes together with a contract, this contract does not oblige certified traders and cooperatives to sell their coffee to certified exporters or certified roasters. Combined with the fact that internet and cell phones enable an easier and faster communication about coffee prices, we see actors easily diverting their businesses to buyers and sellers who offer the best prices at the moment of a transaction. This holds true within channels (e.g. by selling beans to different traders within the same channel), but also across channels (e.g. the preference to sell to exporters over middlemen, or the certified trader's preference to sell to cooperatives, roasters or exporters).

The existence of many channels in the Indonesian coffee market can be beneficial for several actors. High competition combined with freedom to select buyers and sellers offers chances for price-negotiations which potentially result in better prices, a more efficient market and possibilities to mitigate market distortions. As farmers have a broad choice of traders to whom they can sell their beans and as the demand for their beans is generally high, the existence of many channels can be considered positive for the farmers. The existence of many channels is also beneficial for traders and exporters as it allows them to diversify their risks and search for the best prices. In addition, individual consumers may benefit from the existence of many different coffee channels as this offers a wider variety of choice in different coffee types, coffee quality and coffee prices. Consumers can choose high quality coffee for relatively good prices.

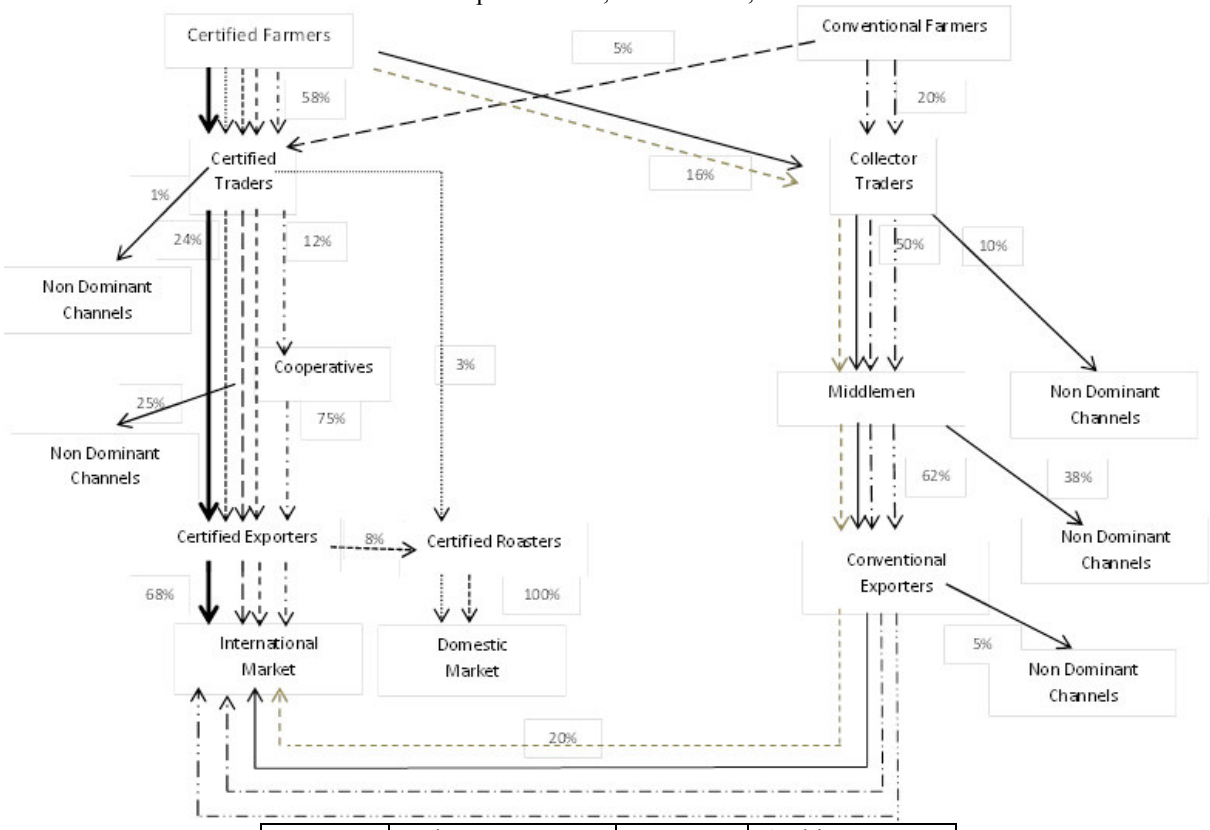
5. Dominant coffee channels

To analyze the economic performance of Indonesian coffee actors and to assess the role of certification in this performance, we selected the most dominant coffee channels based on the criteria mentioned in the method section (see Table 4 and Figure 2). This selection resulted in ten dominant coffee channels: six Robusta channels and four Arabica channels. The Robusta channels consist of certified channels (channel 1, 2, 10), one conventional channel (channel 5), and two mixed channels (channel 13, 15). The Arabica channels cover two certified channels (channel 18 and 20), one conventional channel (channel 24) and one mixed channel (channel 35).

Table 4. Number of Farmers and coffee volume in the dominant (marked cells) and non-dominant (transparent cells) channels

Channel	Actors				Total Percentage	
	Farmers		Certified Farmers			
	Persons	Kg	Persons	Kg	Person	Kg
1			54	55526	32,6	31,8
2			5	5588	3,3	3,2
3	2	1956			1,1	1,1
4	3	2794			1,7	1,6
5	15	14143			9,1	8,1
6	2	1921			1,2	1,1
7	3	3318			1,7	1,9
8	3	3492			1,8	2,0
9			3	3318	1,8	1,9
10			4	4540	2,6	2,6
11			1	1048	0,7	0,6
12			1	1222	0,7	0,7
13			5	4889	2,9	2,8
14			2	2445	1,3	1,4
15	9	10127			5,6	5,8
16	1	873			0,5	0,5
17	1	1048			0,7	0,6
18			11	12223	2,8	7,0
19			1	1222	0,9	0,7
20			8	5064	2,8	2,9
21			2	1571	1,1	0,9
22	1	873			0,7	0,5
23	1	1222			0,7	0,7
24	7	6984			4,3	4,0
25	2	2095			1,3	1,2
26			2	2445	1,6	1,4
27			1	1397	0,7	0,8
28			1	1048	0,7	0,6
29			1	1048	0,8	0,6
30			1	1135	0,7	0,7
31			1	1484	0,8	0,9
32			3	3318	2,0	1,9
33			1	1135	0,7	0,7
34			1	960	0,7	0,6
35			6	0	2,8	2,7
36	1			524	0,5	0,3
37	1			943	0,7	0,5
38	1			908	0,6	0,5
39	1			0	0,7	0,6
40	1			0	0,7	0,6
41	1			0	0,7	0,6
42	1			0	0,7	0,6
	49		116		100	100

Figure 2 illustrates the dominant coffee marketing channels in Indonesia, including Robusta, Arabica, certified, conventional and mixed channels. First, we observe that some dominant channels are the same for Robusta and Arabica coffee (channels 1 and 18; 13 and 35; 5 and 24). Second, we see that both certified and conventional exporters supply coffee beans to the international market, although certified exporters provide higher quantities of coffee to the international market (68%) compared to conventional exporters (20%). Third, the domestic Indonesian market is serviced entirely through certified coffee channels in the dominant channels. Fourth, we also observe that conventional coffee penetrates the certified market in one of the dominant channels (channel 15). Although this only refers to a small portion of the conventional coffee that is sold from conventional farmers to certified traders (5%) it is a dominant channel. Fifth, it becomes clear that least diversification in channels takes place once coffee ends up with the conventional traders. All dominant channels follow the same route after the conventional traders (via middlemen and conventional exporters to the international market). Finally, the most dominant channel is channel 1 in which certified farmers sell their Robusta beans to certified traders. These certified traders sell the beans to certified exporters who, on their turn, sell to the international market.



	Robusta		Arabica
⟶	Channel 1	- - ->	Channel 18
.....>	Channel 2	-·-·->	Channel 20
—·—>	Channel 5	—··—>	Channel 20
------>	Channel 10	- - ->	Channel 35
⟶	Channel 13		
— —>	Channel 15		

Figure 2. Dominant Coffee Marketing Channels in Indonesia.

6. Efficiency of Indonesian coffee channels

Table 5 presents the efficiency of each dominant channel. We see that costs differ substantially between the channels and vary from 14.154 to 33.513 Rupiah per kilogram. Also the profits vary from 7.871 to 107.243 Rp/Kg as well as the lead time which lies between 14 and 36 days. We also see that the channels with the lowest costs (channel 5) are not those with the highest profits (channel 10) or the ones with the shortest lead time (channel 18). At first sight, patterns regarding the channel's destination (international versus domestic market), the status of certification (certified, conventional or mixed) or the species (Robusta and Arabica) seem absent. A closer look however, reveals the following indicative patterns:

1. Profits are significantly higher[1] in the channels with a domestic destination (channel 2 and 10) compared to channels for the international market (P=0.000). The costs are however also significantly higher in those channels targeting at the domestic market (P=0.000). The latter can be explained by the high unit costs (e.g. for processing, roasting, packaging, and marketing) in these domestic channels.
2. There are no significant differences in costs, profits or lead time between Robusta and Arabica channels.
3. The lead time is significantly shorter in the certified channels compared to the conventional and mixed channels (P=0.002). The main explanation is that there are fewer actors involved in the certified channels compared to the conventional and mixed channels.

Table 5. The efficiency of Coffee Marketing Channels (in Rupiah and number of days). Shaded cells refer to those channels whose costs and lead time are lower/ shorter than average, and its profits are higher than average.

	Channel 1	Channel 2	Channel 5	Channel 10	Channel 13	Channel 15	Channel 18	Channel 20	Channel 24	Channel 35
Efficiency	RIC	RDC	RICO	RDC	RIM	RIM	AIC	AIC	AICO	AIM
Cost	14173	32442	14154	33513	14909	14568	14666	15008	22988	15036
Profit	9442	103613	7871	107243	8957	8356	27283	28441	20761	30934
Lead Time	19	16	36	26	34	21	14	21	35	33

R: Robusta I : International Market C : Certified
A: Arabica D: Domestic Market CO: Conventional
M : Mixed

Overall, we conclude that none of the channels scores better than average on all three aspects (costs, profits and lead time) and only 1 channel (channel 24) scores poor on all these aspects. Based on table 5, and following the criteria mentioned in the method, we conclude that channel 1, 2, 15, 18 and 20 score well in terms of efficiency, whereas the other channels, and particularly channel 24, have relatively low scores on efficiency. Four of the 5 efficient channels are certified channels whereas one refers to a mixed channel. This implies that none of the conventional channels can be considered efficient. Nonetheless, we also find one certified channel among the inefficient channels (channel 10). The lead time of channel 10, however, is exactly equal to the average lead time in all channels. Following the criteria in the methods section, this implies that this channel just falls behind the wayside of being evaluated as efficient. Therefore, we conclude that certified channels are generally more efficient than conventional channels.

7. Analysis of the equity of dominant channels

Table 6 reveals the marketing margins (MM) and profit margins (PM) of all actors in the dominant coffee channels that form the basis of our equity analysis. In table 7 we present the deviations in margins compared to the most equitable distribution of margins in each channel (see the methods section). Table 6 and 7 show that no channel can be considered (close to) equitable. We also see that channels that are relatively equitable in terms of marketing margins are also relatively equitable in terms of profit margins (see for example channel 15). There are several observations to derive from the information in Table 6 and 7:

1. Overall, and particularly in channel 2 and 10, the domestic roasters obtains the highest marketing margins (86.33% and 83.44%) and profit margins (94.39% and 91.20%) of all actors in all channels. These relatively high shares also make the channels in which they are involved less equitable. This can be explained as roasters add most value to the raw coffee beans and therefore receive relatively high PMs and MMs, which is in line with the results presented by Astuti et al. (under review). Further, we found evidence that channels targeting at the international market are more equitable than domestic channels (P=0.028)[2].
2. We observe large differences in MM and PM between farmers in different channels. The farmer's MM ranges from 12.37% in channel 10 to 83.47% in channel 18. Their PM even ranges from 4.68% in channel 10 to 82.93% in channel 18. These large differences result from the high profit margins of the roasters. The higher the roaster's margins are, the lower the shares of the farmers.
3. Except for the earlier mentioned destination (international or domestic) we cannot identify significant effects of the type of coffee (Arabica or Robusta) or certification status (certified, conventional, mixed) on equity. Nonetheless, the chances of identifying a relatively equitable coffee channel are higher in Robusta channels targeting the international market and lower in certified Arabica channels targeting the domestic market.

[1] To reveal indicative results on the effects of a channel's destination, status or species, we performed an independent sample t-test with a 0.05 significance threshold. Given the mall sample sizes, this information should be interpreted as indicative and helpful in guiding potentially interesting leverage points for future research rather than pretending to tell the absolute truth. The t-test however adds a bit more reliability to conclusions resulting from solely observing the differences between numbers in table 5.

[2] As our research focuses on Southern actors in the coffee value chain, our analysis excludes PM and MM of international roasters.

Certification does not significantly lead to a more equitable distribution of market margins or profit margins.

4. For smallholders it seems to be beneficial to be involved in a relatively equitable channel, as their MM and PM are relatively high in these channels. However, unequitable channels are not necessarily bad for the farmers. Channel 35 for example, is relatively unequitable although farmers have a relative high MM and PM.

Table 6. The equity of Indonesian Coffee Market Channels: MM and PM.

Robusta	Channel 1		Channel 2		Channel 5		Channel 10		Channel 13		Channel 15	
	RIC		RDC		RICO		RDC		RIM		RIM	
	MM	PM	MM	PM	MM	PM	MM	PM	MM	PM	MM	PM
Certified Farmers	74.70	53.21	12.80	4.85			12.37	4.68	75.16	56.09		
Conventional Farmers					74.80	50.03					74.33	47.13
Certified Traders	5.09	8.35	0.87	0.76			0.84	0.73			5.16	9.43
Collector Traders					3.02	3.62			2.98	3.18		
Large Traders					3.56	5.15			3.51	4.52		
Certified Exporters	20.22	38.45					3.35	3.38			20.51	43.44
Conventional Exporters					18.61	41.20			18.35	36.21		
Certified Roasters			86.33	94.39			83.44	91.20				
Conventional Roasters												
	100	100	100	100	100	100	100	100	100	100	100	100
Arabica	Channel 18		Channel 20		Channel 24		Channel 35					
	AIC		AIC		AICO		AIM					
	MM	PM	MM	PM	MM	PM	MM	PM				
Certified Farmers	83.47	82.93	80.80	79.91			82.27	82.15				
Conventional Farmers					81.37	73.40						
Certified Collectors	2.47	2.33	2.39	2.24								
Cooperatives			3.20	3.64								
Collector Traders					2.11	2.43	2.01	1.63				
Large Traders					3.03	4.49	2.88	3.02				
Certified Exporters	14.06	14.74	13.61	14.20								
Conventional Exporters					13.48	19.67	12.83	13.20				
Certified Roasters												
Conventional Roasters												
	100	100	100	100	100	100	100	100				

R: Robusta I : International Market C : Certified MM: Market Margins
A: Arabica D: Domestic Market CO: Conventional PM : Profit Margins
M : Mixed

Table 7. Deviations from the most equitable distribution of margins in each channel. Shaded cells refer to deviations that are below average. A score of 0 would reveal a fully equitable share of margins in which all actors receive the same proportion of profits and margins. The higher the number in this table, the less equitable a channel can be considered.

Equity	Channel 1 RIC	Channel 2 RDC	Channel 5 RICO	Channel 10 RDC	Channel 13 RIM	Channel 15 RIM	Channel 18 AIC	Channel 20 AIC	Channel 24 AICO	Channel 35 AIM
MM	82.73	105.99	99.60	116.87	100.33	82.00	100.28	111.60	112.74	114.54
PM	49.98	122.11	82.47	132.39	84.59	47.81	99.20	109.83	96.80	114.30
Average	66.35	114.05	91.04	124.63	92.46	64.90	99.74	110.71	104.77	114.42

8. Performance of Indonesian coffee channels: combining Efficiency and Equity

Table 8 shows the performance of dominant channels in the Indonesian coffee market which reveals that the most efficient channels are not necessarily the most equitable channels. The best performing channels are channel 1, 15 and 18, whereas channel 10, 24 and 35 are performing relatively poorly. It is hard to find patterns in the performance of different channels, as both the well and poor performing channels include Robusta and Arabica coffee, and certified and mixed channels. It is however remarkable that all well performing channels are directed at the international market, and conventional channels are not part of the well performing channels.

Table 8. Performance of the dominant Indonesian coffee channels. Shaded cells with a +-sign indicate that the channel is performing better than average on the mentioned aspect.

Performance	Channel 1	Channel 2	Channel 5	Channel 10	Channel 13	Channel 15	Channel 18	Channel 20	Channel 24	Channel 35
	RIC	RDC	RICO	RDC	RIM	RIM	AIC	AIC	AICO	AIM
Efficiency	+	+				+	+	+		
Equity	+		+		+	+	+			

9. Conclusion

In this paper we hypothesized that the type of marketing channel is an important structural factor influencing the economic performance of Indonesian coffee production, independent from the fact whether the coffee under analysis is certified or conventional. We investigated whether certified marketing channels are different from conventional channels and whether certified channels show a better economic performance than non-certified channels. The hypothesis is partly confirmed by our data and partly rejected. First, we indeed found that the type of channel matters for performance as there were clear and significant differences in efficiency and equity among the channels. Second, we could not verify that performance was independent from certification as certified channels were more efficient than conventional channels. In terms of equity, we could however not find significant differences between certified, conventional and mixed marketing channels. Overall, as none of the well performing channels, was a conventional channel, we conclude that certification increases the chances of a relative good economic performance. Certification is however no guarantee for a good economic performance and it may even be questioned whether benefits in terms of economic performance can be attributed to certification or to the institutional context wherein certified actors operate. Particularly the relative shorter length of certified and mixed channels seems to contribute to a better economic performance. However, shortening channels, for example through certification, inevitably leads to ruling out middlemen and traders. Although positive for the vulnerable farmers, this may lead to other challenges like the deprivation of traders and middlemen and therewith shifting the problem of poverty, low bargaining power and vulnerability from the farmers to other actors in the value chain. Following Astuti et al. (under re-review) we cannot only conclude that roasters are the Southern actors who benefit most from certification, but they also seem to benefit from the institutional diversity resulting from the existence of many coffee channels in Indonesia. Profitability improvements, particularly in terms of equity, may be realized if farmers could - next to selling raw beans- also develop roasting facilities. This however may have the same implications as mentioned above: shifting vulnerability and poverty problems from the farmers to middlemen and traders.

We have to acknowledge that this paper, although revealing important patterns, has three flaws that also form the leverage points for further research and improvements. First, the exclusion of Northern-based roasters results in incomplete information regarding the distribution of MM and PM in the international channels. We expect that the involvement of Northern (e.g. European and US) roasters in this study would affect the distributional pattern of marketing margins and profit margins as it seems likely that farmers' rents would even go down further in international value chains. Second, the number of respondents in our study (particularly for the roasters and exporters) was relatively low. Although we checked the reliability of our data through interviews, it is good to treat the data as indicative at this stage and it is therefore advisable to extend this research to other parts of Indonesia to also add more rigor to the method. Third, this study relies heavily on the respondent's estimations on their profits and costs. For a diversity of reasons, these estimations may not be fully in line with reality. Through interviews and cross-checking these estimations we tried to verify the relative reliability of our data, but we have to remain receptive for further verification of these data. An interesting topic for further research embraces the influence of different organizational and institutional characteristics on the economic performance of actors in the Indonesian coffee value chain. More specifically, it would be interesting to investigate the influence of differences in business models on economic performance and the role of certification in these different types of business models. Business models can be approached as alternative ways to enhance economic performance, but also as mediators thought which the effects of certification on economic performance are shaped.

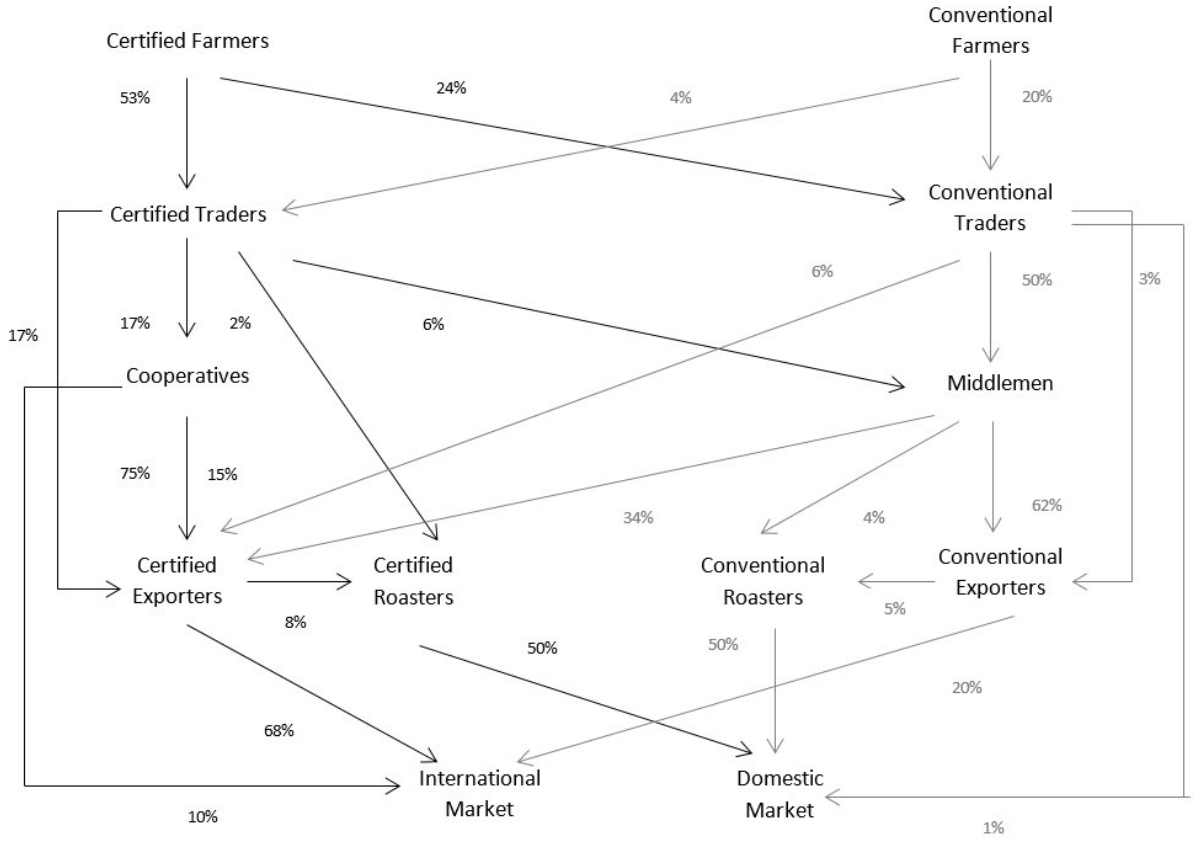
A. Annex 1. Coffee Market Chanels

Channels	Robusta and Arabica Channels
1, 18	Certified Farmers → Certified Traders → Certified Exporters → International Market
2, 19	Certified Farmers → Certified Traders → Roasters with Certified Coffee → Domestic Market
3, 22	Conventional Farmers → Conventional Collector Traders → Conventional Exporters → International Market
4, 23	Conventional Farmers → Conventional Collector Traders → Roasters with Conventional Coffee → Domestic Market
5, 24	Conventional Farmers → Conventional Collector Traders → Middlemen → Conventional Exporters → International Market
6, 25	Conventional Farmers → Conventional Collector Traders → Middlemen → Roasters with Conventional Coffee → Domestic Market
11, 34	Certified Farmers → Conventional Traders → Conventional Exporters → International Market
12, 30	Certified Farmers → Conventional Traders → Roasters with Conventional Coffee → Domestic Market
13, 35	Certified Farmers → Conventional Traders → Middlemen → Conventional Exporters → International Market
14, 31	Certified Farmers → Conventional Traders → Middlemen → Roasters with Conventional Coffee → Domestic Market
Channels	Robusta Channels
7	Conventional Farmers → Conventional Collector Traders → Middlemen → Conventional Exporters → Roasters with Conventional Coffee → Domestic Market
8	Conventional Farmers → Conventional Collector Traders → Certified Exporters → International Market
9	Certified Farmers → Certified Traders → Middlemen → Certified Exporters → International Market
10	Certified Farmers → Certified Traders →Certified Exporters→ Roaster with Certified Coffee → Domestic Market
14	Certified Farmers → Conventional Traders → Middlemen → Roasters with Conventional Coffee → Domestic Market
15	Conventional Farmers → Certified Traders→ Certified Exporters→ International Market
16	Conventional Farmers → Certified Traders→ Middlemen→ Conventional Exporters → International Market
17	Conventional Farmers → Certified Traders→ Middlemen→ Certified Exporters → International Market
Channels	Arabica Channels
20	Certified Farmers → Certified Traders → Cooperative → Certified Exporters → International Market
21	Certified Farmers → Certified Traders→ Cooperative → Roasters with Certified Coffee → Domestic Market
26	Certified Farmers → Certified Traders→ Middlemen → Conventional Exporters → International Market
27	Certified Farmers → Certified Traders → Middlemen → Conventional Exporters → Roasters with Conventional Coffee → Domestic Market
28	Certified Farmers → Certified Traders → Middlemen → Roasters with Conventional Coffee → Domestic Market
29	Certified Farmers → Conventional Traders → Certified Exporters → International Market
32	Certified Farmers → Conventional Traders → Middlemen → Certified Exporters → International Market
33	Certified Farmers → Conventional Traders → Middlemen → Certified Exporters → Roasters with Certified Coffee → Domestic Market
36	Conventional Farmers → Certified Traders → Cooperatives → Certified Exporters → International Market
37	Conventional Farmers → Certified Traders → Cooperatives → Certified Roasters → Domestic Market
38	Conventional Farmers → Certified Traders → Certified Exporters → International Market
39	Conventional Farmers → Certified Traders → Certified Exporters → Certified Roasters → International Market
40	Conventional Farmers → Certified Traders → Middlemen → Conventional Exporters→ International Market
41	Conventional Farmers → Certified Traders → Middlemen → Certified Exporters→ International Market
42	Conventional Farmers → Certified Traders → Middlemen → Certified Exporters→ Certified Roasters→International Market

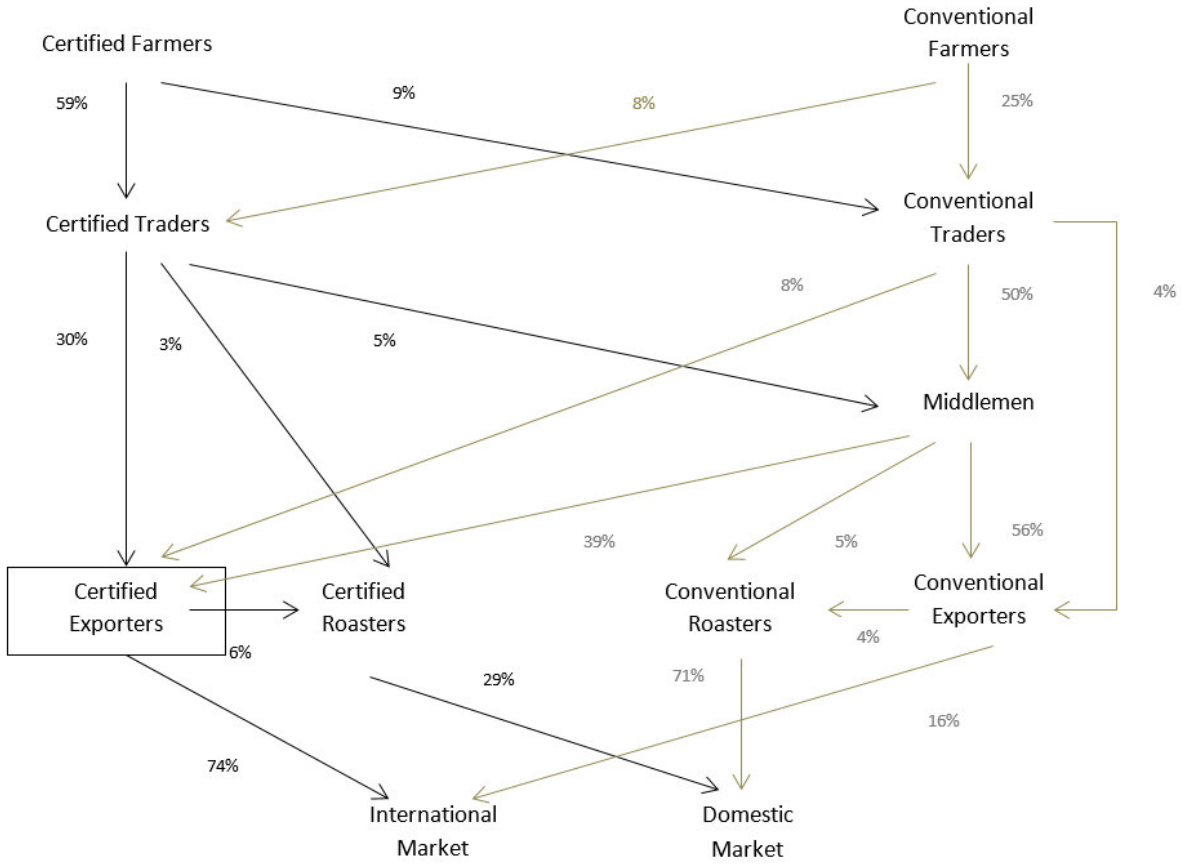
Robusta: channel 1-14; Arabica: channel 15-32; Purely certified market channels: channel 1, 2, 10, 15, 16, 17, 18; Conventional channels: channel 3, 4, 5, 6, 7, 19, 20, 21, 22; Mixed channels: 26 channels in total.

B. Annex 2. Arabica and Robusta Channels

Arabica Channels



Robusta Channels



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