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Market Efficiency Analysis of Organic Coffee in Ermera Regency

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ABSTRACT

Coffee is one of the commodities becoming the source of income of about 25% of households in Timor-Leste, including in Ermera Regency as a production center with a total area of about 57%. Coffee has been developed since decades ago with the organic systems approach and its products have been exported to several countries in Europe, USA, Australia, New Zealand, Japan, China and Singapore. However, its marketing still becomes the concern of many stakeholders in the coffee agribusiness. This study then aims to (1) Determine the pattern of the existing marketing channels (2) Analyze market efficiency by looking at market structure, market conduct and market performance. The results of the analysis show that the market structure is oligopoly, seen from a high concentration index value (96%) while the analysis of the Minimum Efficiency Scale (MES) results in 62%. This suggests that pricing mechanism is dominated or determined mostly by wholesalers than farmers and middlemen as well as the presence of sizable barriers for new companies to enter the market of organic coffee in Ermera Regency. The analysis on marketing margin indicates that farmers obtain higher price share (56%) on the sale of coffee in the form of coffee cherries while the sales of coffee parchments are relatively low both for Arabica coffee beans (47%) and Robusta coffee beans (38%). Thus, selling the coffee cherries through channel one and channel two is more profitable for farmers than selling in the form of coffee parchments for both Arabica and Robusta beans, yet, purchasing coffee in the form of parchments is more profitable for coffee wholesalers.

Key words: Efficiency, market structure, market conduct, market performance

INTRODUCTION

Coffee plants in Timor-Leste are generally cultivated by adopting the organic systems. For the economy of the country, coffee is one of the most favorite plantation commodities holding such important and strategic role as a source of income for about 25% of farm households in Timor-Leste, contributing a sizeable foreign exchange for the country, which is more than 90% of the non-oil sector and provides employment (PES., 2009). Coffee is not a native plant of Timor-Leste but was introduced by the government of Portugal during its reign; it has been long developed with low input such as organic fertilization and natural-enemies pest and disease control and used Paraserianthes falcataria and Casuarina junghuhniana trees as the main shade trees. The type of coffee planted to date is Arabica, Robusta and Liberica. However, only Arabica and Robusta coffee play an important role in the agricultural sector in Timor-Leste. Results of a survey in 2001 show that coffee as the main source of non-oil foreign exchange and the main source of income for

approximately 45,000 households (families) spread in several regencies as coffee production centers, such as the Regencies of Ermera, Liquica, Ainaro Manufahi and Bobonaro (World Bank, 2001). The production and productivity of coffee in Timor-Leste is still far from normal production potential. The highest production achieved in the last ten years was in 2007 as many as 14,000 tones with an average productivity of 200 kg (green beans) or half of the production using good and proper technology. The average export volume of coffee is 90% of the total production while the remaining 10% is for domestic trading (DNPIAC.MAP TL). In general, the coffee marketing system in Timor-Leste r involves multiple parties or agencies, such as middlemen, cooperatives and NGOs (non-governmental organizations) as well as farmers and wholesalers or exporters. The forms of coffee sold by the farmers to middlemen and wholesalers are coffee cherries and parchment. Thus, the price received by farmers is different, depending on the type of coffee, the form of coffee (cherry or parchment), the distance from the production or processing center and the quality of the coffee itself. In general, coffee cherries are sold by the farmers at a price of 0.25-0.75 dollars while the parchment's price varies between 1-1.5 US dollars.

So far, there has not been much research on the market efficiency of organic coffee in Ermera Regency which analyzes the market structure, market conduct and market performance. Thus, the decision system of marketing agencies, obstacles in and out of the market, product differentiation and market concentration index has not been known. Some indicators that can be used to determine the market efficiency is price efficiency, technical efficiency and operational efficiency. In this study, the market efficiency indicators are seen from the market structure, market conduct and market performance analysis through marketing margins analysis, farmer's share and profit ratio. Thus, the objectives of this study are (1) To find out the existing pattern of marketing channel, (2) To examine the market structure and market conduct in the marketing of organic coffee and (3) To examine the performance of organic coffee marketing in Ermera Regency, Timor-Leste.

Coffee plants are not native to Timor-Leste but they were introduced by the Portuguese in the mid-eighteenth century the types bought were the Arabica and Robusta coffee. However, their development began in the 1870s through various programs such as nurseries, processing, distributing seeds to farmers and the programs were also done through forced labor program. Coffee began to contribute as an important source of income for farmers and their families after a couple of years in the late 1980s and started to become one of the reliable export commodities at the time. The main buyers of coffee from the community were the Chinese traders and European traders. In 1956, Cafe Hibrido de Timor became famous around the world as it was the natural result of a plant breeding system between the two varieties of Arabica Tipica and Robusta having a special characteristic being resistant to leaf rust disease (Hemilia vast).

Coffee has always been a belle commodity for export from Timor-Leste in addition to gas and oil. Timor-Leste has the potential and opportunities in the development of organic coffee especially Arabica coffee. The factors which strongly support the development of coffee in Timor-Leste are the climate, type of soil, topography and altitudeCall are suitable for coffee plants. Coffee is a plant that grows in almost all regencies of Timor-Leste; however, there are only six regencies as the center of production of coffee, because they have such vast area compared to the rest. In the sixth production center, many facilities such as nurseries, cherry and bean processing facilities both in medium and large scale have been built. According to statistics of the National Directorate of Industrial Crops and Agribusiness, in 2013 the total area of coffee plantation in the Timor-Leste is 54,876 ha with a production of 9,379 t, or an average of less than 200 kg (green beans) per hectare, as shown in Table 1.

Table 1: Area and coffee production by regencies, 2013

Regency	Area (ha)	Production (t)	Productivity (t ha^{-1})
Ermera	31616	3615	0.12
Ainaro	5077	1605	0.32
Liquica	6795	1655	0.25
Aileu	1457	192	0.14
Bobonaro	2583	462	0.18
Manufahi	7350	1850	0.25
Total	54876	9379	

Direcao Nacional Plantas Industriais e Agro-comercio (DNPIAC), Timor-Leste

Ermera Regency is a production center with the largest area, measuring 31 616 ha, or about 56% of the total acreage in the country but the productivity is only 120 kg per acre numbering the lowest compared to the other regencies while the highest productivity belongs to Ainaro Regency (320 kg ha^{-1}). Fluctuated coffee price in the world significantly affects the price of coffee at farmer level or producer level. Some of the important factors affecting the price of coffee on the world market or internationally is the consumption, distribution and quality in addition to global issues such as healthy products, sustainable agriculture and environmentally friendly farming. Good and stable price of coffee would be a very good motivation of farmers in an effort to improve the production and quality of their coffee. Conversely, if the coffee price slumps or falls dramatically, farmers usually abandon coffee plantations and move on to another form of agriculture. Thus, price stability needs to be realized in order to guarantee the good quantity and quality of coffee continuously.

Organic coffee is none other but coffee produced with or without the use of inorganic fertilizers and pesticides. This is traditionally known as a low input use, the use of human labor in the management, including in harvesting. Basically, organic coffee farming does not refer simply to refusal to inorganic materials but this kind of farming also considers other factors such as natural methods in controlling erosion on sloping land, coffee pruning, maintenance, weed control and provision of organic materials such as compost and mulch.

From the socio-economic aspects, there are also benefits to be obtained not only by farmers but also by all parties involved in the agribusiness, especially buyers or intermediaries and consumers of organic coffee itself. Organic coffee farms can maintain and improve the biological cycle through the improvement of flora organisms, micro-organisms in the soil, as well as plants and animals. Thus, in turn, it will contribute to good environmental balance. Some basic criteria or standards set by IFOAM (International Federation of Organic Agriculture Movement) that need to be considered in the management of organic coffee in Timor-Leste as follows: (1) The coffee plant area should be free from synthetic chemicals such as inorganic fertilizers and pesticides and has a relatively large buffer region, (2) Varieties of coffee grown should be able to adapt to the conditions of the area such as soil conditions, climate, as well as pests and diseases resistance; the use of good shade trees for coffee with major shade tree of Paraserianthes falcataria and junghuhniana is also necessary; and (3) The use of organic materials in an effort to improve soil fertility and pest and disease control wisely with IPM (Integrated Pest Management).

Information associated with organic coffee prices are varied depending on the sources. There are sources stating that it is very difficult to define premium quality as it depends on the quality and origin of the coffee itself; and one of the criteria is the reputation of the manufacturer or the addition of certifications like the fair-trade certification. But in essence, the word "Apremium" is related to quality (Pay, 2009).

METHODOLOGY

Research methods: This research was conducted in Ermera Regency with consideration that it is a center of coffee production having the largest area in Timor-Leste. The study was conducted from June until August 2014. The type of data collected consisted of quantitative data and qualitative data. The data is collected from primary and secondary data sources. (1) The primary data was collected in the form of cross-section data. (2) The secondary data was collected from relevant agencies such as the Ministry of Agriculture, the National Directorate of Industrial Crops, the Ministry of Industry and Trade and related agencies. Sampling method used was probability sampling based on the concept of random selection. Random sampling is a method of selecting a random sample size in which every member of the population has an equal opportunity to be selected as the sample. The sampling is done by a lucky draw method (Hussein, 2008). The data collection methods used included (1) Observations, (2) Interviews and (3) Documentation.

Data analysis methods: There are two methods of data analysis used in this study, namely the descriptive analysis and quantitative analysis. Descriptive analysis is used to describe the agencies involved in the coffee marketing system as well as functions they do. Quantitative analysis is used to examine or analyze the market efficiency of the organic coffee by looking at market share, market concentration and barriers to entry or exit market, as well as market performance, marketing costs, marketing margins, farmers share and profit ratio.

Analysis of market structure: Four Firm Concentration Ratio (CR4) is a method of analysis able to see the output generated by the four major industries (in this case the organic coffee farmers) in the Regency of Ermera. Baye (2010) explains that there are two criteria for determining the market concentration. First, if the value of CR4 is near zero (0), it indicates that market has a lot of sellers as well as provides an increase in sales of producers to consumers. Conversely, when the value of CR4 approaches one (1), This indicates that the market is concentrated, meaning that it experiences little competition among manufacturers. The calculation of market share analysis can be viewed as follows:

$$\text{Market share (MSn)} = \frac{\text{sn}}{\text{SA}} \times 100\%$$

Where:

Market Share (MS)	=	0-100%
Market Share (Msn)	=	farmer's share of the market "n" (percent)
Sn	=	Purchase of coffee from farmer (kg/season)
SA	=	Total amount of coffee in Ermera (kg/season)
n	=	Number of organic coffee farmers

Barriers to entry or exit market can be analyzed or calculated by the Minimum Efficiency Scale (MES). MES represents the calculation of coffee purchased by farmers to the total organic coffee available in Ermera Regency. If the value obtained or generated from MES calculation shows more than 10%, it indicates that there are barriers to entry the market of organic coffee in Ermera Regency.

The formula of MES is as follows:

$$MES = \frac{\text{Amount of organic cofee purchased by wholesaler}}{\text{Total amount of organic coffee in ermera district}}$$

Analysis of market conduct: Market conduct gives more emphasis on activities that occur or take place in the market by observing the practice of sale and purchase, the determination and payment system and cooperation that exists among marketing agencies. Performance is characterized by market structure and market conduct. Some of the important marketing function performed is physical functioning, role exchange functioning and provision of facilities (Kohls and Downey, 1972).

Market performance: Some important formulas used in analyzing market performance are as follows:

- **Marketing margin:** The delivery of a product to consumers always involves some marketing agencies so that the total marketing margin is the sum of the marketing margin of each marketing agencies. Systematically, it can be formulated as follows:

$$MT = \sum_{t=t}^{n} Ml$$

Where:
Mt = Total marketing margin (US\$ kg^{-1})
i = 1, 2, 3 ... n

Mathematically, the marketing margin can be written as follows (Limbong and Sitorus, 1987):

$$Mi = pri\text{-}pfi$$
$$Mi = ci\text{+}\pi i$$

Where:
Mi = Marketing margin on institution-i (US\$/kg)
Pri = Price at retail level-i
Pfi = Price at farmer level-i
Ci = Marketing cost incurred by institution-i
πi = Profit earned by institution-i

- **Farmers share:** The indicator used to compare the prices received by producers in comparison to the price paid by the final consumer is the farmer's share (part of the price received by farmers) is expressed as a percentage. Mathematically, it can be written as follows (Limbong and Sitorus, 1987):

$$Fs = \frac{Pf}{Pr}$$

Where:
Fs = Farmer's share
Pf = Price at the producer/farmer level
Pr = Price at consumer level

If the price offered by the merchant/marketing agencies is higher and the consumer's ability to pay is also increasing, the share received by farmers will be lower. This is because farmers sell commodities at a relatively low price. The larger the margin, the profit earned by farmers is relatively small. Thus, it can be seen that there is a negative relationship between the marketing margin and farmer's share.

- **Ratio of profits and costs:** The ratio of benefits and costs in marketing agencies can be formulated as follows:

$$\frac{Li}{Ci}$$

Where:
Li = Profit earned by marketing agencies
Ci = Cost of marketing

When the value of the ratio of benefits and costs is equal to one, it indicates that the profits generated is equal to the cost incurred and when the value of is greater than one, it indicates that the benefits outweigh the costs already incurred.

RESULTS AND DISCUSSION

Channels and marketing functions: Based on research conducted by Ima (2006), Dila (2013), Salazar, (2006), Ladi (2003) and Roni (2009) regarding the marketing of agricultural commodities such as coffee, cashew nuts, gambir and cocoa, there are some to consider, among which are (a) farmers lack information about the commodities they sell making them not knowing the more favorable price for them this make them to prefer the existing marketing agencies with consideration of easier payments in the transaction process, reducing the risk because farmers bear higher risk during transaction and low attention to the grading factor in determining price; (b) the general marketing system of commodities is not efficient due to several factors such as the length of marketing channels, lack of honesty on the intermediaries and market structure which tends to be oligopolistic and not integrated and (c) on cocoa commodity, the factors that positively influence the choice of marketing channels is farmer age, education and livelihood as well as the high selling price of cocoa beans.

Coffee marketing channel according to the Hanafiah and Saefuddin (1986) consists of middlemen who buy and sell coffee regardless of whether they own the coffee themselves or just act as an agent on behalf of the coffee owners or farmers. Organic coffee marketing channels emerge due to the needs of the other areas restricted by the distance from the manufacturer. With the limitations possessed by coffee farmers such as distances, limited capital, lack of knowledge, difficult access to transportation facilities and infrastructure, they are in the position of low bargaining power.

Salazar (2006) in her research described that Arabica coffee still dominates coffee market which reaches 75% of the coffee sold in the world, although not all types of Arabica coffee have high levels of productivity. The use of organic fertilizer on coffee farming is inefficient compared to the use of inorganic fertilizers. In contrast, the use of chemical pesticides makes faming inefficient seen from the cost allocated. A study by Shumeta *et al.* (2012) on coffee marketing with SCP approach shows that there are only three main actors in the chain of coffee market in Southwest Ethiopia seen from the standpoint of market structure, namely farmers, retailers and wholesalers. The portion of the largest profit margin is earned by exporters.

So far, organic coffee is the most successful model in the niche marketing of products that have high value seen from the social and environmental aspects able to have a positive effect on the income of small farmers and ecosystems. Mexico is a major exporter of organic coffee in the world with an estimate of 11,000 certified and organized organic farmers owning an area of approximately 15,000 ha capable of producing more than 6,000 t organic coffee per year (Bray *et al.*, 2002).

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Coffee is sold by the respondent farmers (as many 100 farmers) only to the wholesalers who subsequently export the beans to various destination countries such as the United States, several European countries, Japan, China, Australia, New Zealand and others. As for the coffee channel in the Regency of Ermera, East Timor is presented in Fig. 1.

Based on Fig. 1, it can be seen that farmers in Ermera Regency market their coffee through two marketing channels, namely middlemen and wholesalers buying coffee cherries and wholesalers buying parchments. Seen from the forms of coffee sold by farmers, they only have two marketing channels. In the first channel, respondents (86%) sell their cherries at the average price of US$ 0.32 per kilogram to wholesalers and all the process of coffee production from the cherries until it is ready to be sold to costumers or to be exported is done by wholesalers. Then, wholesalers export or sell the coffee (green beans) to customers at US$ 3.5 per kilogram in 2013.

Meanwhile, according to the study conducted by Ika (2013) and Efendi (1999) regarding the market efficiency of crop and horticulture such as corn and vegetables, it has been revealed that wholesalers have the greatest influence in determining price in addition to other intermediaries.
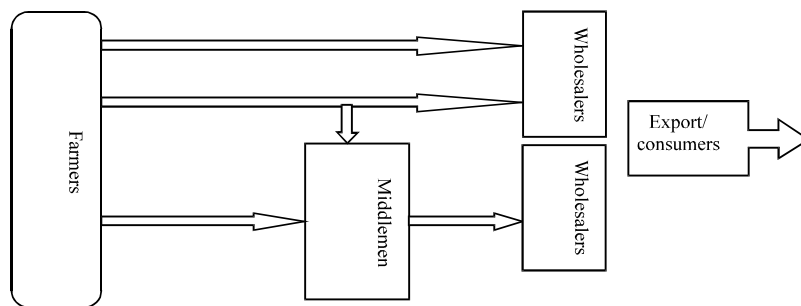

Fig. 1: Coffee channel in the regency of ermera, Timor-Leste, 2013

Organized farmer groups can improve the bargaining position to get better prices and also have the ability to provide sufficient volume of commodities needed. As an example, certain vegetable farmer groups are more easily organized because the average level of education is secondary and upper secondary school with the productive age range of 18-40 years. For vegetable commodities, there are two important factors causing low prices; the first is that farmers do not perform physical functions and facilities and the second is that farmers do not harvest the vegetables at the same time.

In the second channel, farmers sell their cherries to middlemen and then the middlemen do some marketing functions before the cherries are sold to wholesalers and wholesalers also do some marketing functions before selling the coffee to costumers or exporting. Thus, there are processing activities done by both middlemen and wholesalers. The respondents (47%) sell their coffee in the form of cherries (2,640.4 t) and parchments (6,277.5 t). The respondents selling their coffee in the form of parchments are 40%. Based on the two marketing channels, the average amount of cherries sold by each farmer is 1.26 t (86% of the respondents) and the average amount of parchments sold by each farmer is 1.9 t (14% of the respondents). Therefore, it can be said that the average amount of cherries sold by farmers is lower than the average amount of parchments sold. The payment system for both channels is done through a cash payment, thus farmers can get the payment directly after transaction is done. The amount of coffee sold by the respondents as well as wholesalers based on the forms and types of coffee is presented in Table 2.

Analysis on the marketing function is performed against each of the agencies involved in the each marketing channel, in addition to marketing margin they gain. To see whether a marketing system is efficient or inefficient, analysis on the marketing functions is needed. As for the functions carried out by each marketing agencies of organic coffee in Ermera Regency of Timor-Leste is shown in Table 3.

Table 2: Marketing volume, marketing value and average price of coffee in ermera Regency, 2013

No.	Note	Marketing volume (t)	Value (USD)	Average
Respondents				
1	Cherries	106.401	36176.34	0.340
2	Arabica parchments	26.404	35935.64	1.360
3	Robusta parchments	6.277	4583.88	0.730
Wholesalers				
1	Arabica coffee beans	3556	12,232,640 3.440	
2	Robusta coffee beans	315	822,150	2.610

Primary data processes

Table 3: Marketing channel agencies and their marketing functions

Marketing channels	Marketing functions									
	Exchange			Physical				Facility		
	Sell	Buy	Transportation	Storage	Packing	Processing	Market information	Financing	Risks	Sorting
Channel I										
Farmers	V	-	-	-	-	-	-	-	-	-
Wholesalers	V	V	V	V	V	V	V	V	V	V
Channel II										
Farmers	V	-	-	V	V	V	-	-	-	-
Wholesalers	V	V	V	V	V	V	V	V	-	-
Wholesalers	V	V	V	V	V	V	V	V	V	V

V: Carry out marketing functions, -: Not carry out marketing functions

Market structure analysis: The structure of the market is the dimension that describes the system of decision-making by companies or industries. There are four determinants of market structure characteristics: (1) The number and size of the market (2) A condition or state of the product (3) Exit or entry conditions and (4) Market information. There are sellers and buyers in the market as well as in the agricultural commodity market. Ermera Regency as an area of coffee production whose community is mostly coffee farmers and the number of sellers is more than the number of buyers of cherries and parchments. The market with equal number of sellers and buyers categorized as a perfectly competitive market. In such market conditions, price is determined by the demand and supply of the products so there is competition in the nature of products, the amount of products and others. Within this kind of competition, some sellers with their specifications on their economic activities establish marketing channels and market structure in the marketing system.

As for the number of buyers and sellers, the presence or absence of product differentiation, barriers to entry or exit and market structure in marketing organic coffee in Ermera Regency is presented in the Table 4.

As presented in Table 4, there are 100 farmers as respondents selling their coffee to 9 wholesalers consisting of 5 intermediary traders or middlemen and 4 wholesalers or exporters. The sale transactions are then performed by middlemen to 4 wholesalers and then the wholesalers sell the product to consumers or export them. Coffee sold by farmers is in the form of cherries and parchments with average moisture content of 14% while middlemen simply sell coffee in the form of parchments with average moisture content of 12% to wholesalers and coffee sold by wholesalers is in the form of green beans. In general it is known that Arabica coffee has a yield of 16-1% while Robusta coffee has a yield of 22-24%.

At all levels, both at the level of farmers, middlemen and wholesalers, processing and storage is conducted so there is a differentiation of products marketed by each of these marketing agencies. At the level of farmers, 14% of the respondents do not conduct any processing method to the coffee they harvest, 39% of the respondents process the coffee and also sell their coffee in the form of cherries or raw. The reasons for not conducting any processing methods are limited time and the unavailability of processing machines, as well as immediate needs of money for daily needs. Respondents selling their coffee in the form of parchments state this way gives them higher bargaining power and possibility to get higher price. The coffee sold by wholesalers to consumers or exporters is the green beans with average moisture content of 10%.

Market structure can be examined qualitatively by analyzing market concentration in Ermera Regency, Timor-Leste. According to Baye (2010), market concentration can be analyzed by measuring the output resulted from the industry produced by the Four Firm Concentration Ratio (CR4). The indicator for market concentration is that the higher CR4, then it can be said that there is a power tendency in the market. Some measures that can be used to examine market structure is (a) Market concentration, (b) Exit-entry and (c) Product differentiation-within this situation, companies having high market concentration have the ability to gain more profit through product

Table 4: No. of Sellers, Buyers, Product differentiation, barriers to entry and exit of coffee marketing in ermera regency

Market characteristics	Farmers	Middlemen	Wholesalers/exporters
No. of sellers	100	5	4
No. of buyers	9	5	4
Product differentiation	Yes	Yes	Yes
Barriers to entry and exit	No	Yes	No

Table 5: Four firm concentration ratio of coffee producers in Ermera Regency, 2013

Wholesaler/big companies	Market volume (t)
Wholesaler I	2266
Wholesaler II	715
Wholesaler III	520
Wholesaler IV	55
Total coffee production in ermera regency	3615
Concentration	0.98

differentiation, or the effort to make customers more loyal to the products produced by the companies. The index of market concentration of this organic coffee in Ermera Regency is presented in Table 5.

CR4 value greater than 50% represents a strong oligopoly, the value of CR4 between 25% and 50% represents a weaker oligopoly and the value of CR4 less than 25% shows that the market is not oligopoly. Table 5 shows that the concentration value obtained is very high, 0.98, or it can be said that the Four Firm Concentration Ratio (CR4) is a powerful oligopolistic industry or industry that has the ability to control 98% of the total production. It also illustrates that there is no competition between companies or wholesalers of coffee in the coffee market in Ermera Regency. Based on the description afore-presented and the composition of the marketing actors, especially the number of sellers and buyers, it can be said that the market formed is not a perfectly competitive market due to the fact that the number of coffee sellers are far more than the number of coffee buyers. The other constraint is on the sales coffee cherries or the commodity that has not undergone differentiation. When farmers can sell coffee in the form of parchments or clean coffee, then farmers will gain added value from these additional activities. Meanwhile, the market entry barrier quite visible is the capital. This is indicated by the absence of a financial institution that provides credit facilities to the farmers. While the analysis of the MES (Minimum Efficiency Scale) reaching 62% indicated that the marketing of organic coffee in Ermera Regency does not possess any barriers for new companies to entry or with the assumption that large companies have been able to buy more than half of the coffee production marketed in Ermera Regency.

Pricing system and the formation of inter-seller prices: According to Kohls and Uhl (2002) the behavior of marketing agencies in certain market structure covers purchases and sales, pricing and marketing strategy. Market behavior can be determined by observing the practice of sales and purchases made by each marketing agency, pricing system, the ability of the market to absorb the amount of product sold, market stability, payment system and cooperation among the various marketing agencies. In marketing a product, price is a factor that greatly affects the volume of sales and purchases of a commodity. Coffee price established in the market depends on the information of the price in the international market. In general, the price of coffee is low when there is global increase in coffee production. In this study, it is noted that wholesalers selling coffee to consumers or exporters and the purchase price at the farmer level is based on the price offered at the wholesale level. Usually near the harvesting time, the price of coffee begins to be disseminated to farmers especially the price of cherries. The price of parchments is based on the average yield of the types of coffee sold. The yield of Arabica coffee is 25% while Robusta coffee is in the range of 30% with an average moisture content of 13%, or in other words, taking into account the amount of expenses incurred for parchment production process.

The demand theory explains that if the price of a product increases, the number or amount of products offered will increase as well. Thus, farmers will be more motivated to boost production and productivity in an effort to offer more coffee products when the price of coffee increases. Conversely, if the price of coffee decreases, farmers tend to switch to another kind of crop or commodity and certainly will bring impact to the overall production of coffee. In the study area, there are a number of farmers who do not care for or do not conduct any maintenance for their coffee plants since the price they receive cannot cover the production costs. The average price of cherries is at the range of 0.25 to 0.40 US dollars per kilogram while the average price of parchment is US$ 1.25 per kilogram.

Practice of selling and buying coffee: The term "farmer groups" in fact has long been recognized and known by farmers, including coffee growers in the Regency of Ermera. However, the function of the farmer groups is generally limited to activities especially coffee farming practices; although the groups also function to inform the price of cherries before harvesting time. So far, no farmer groups that function in marketing the coffee of their members so all coffee farmers sell their cherries and parchment individually. This is caused by the fact that the farmer groups have not been functioning well to help their members, the existing urgent need for farmers both for families and for coffee farming itself and the lack of clear pricing information. These conditions are taken for good by traders by meeting the farmers directly in buying or selling coffee. The price offered by these traders is usually lower than the price expected by the farmers for both cherries and parchments. With such weak bargaining power, farmers tend to accept the price set by traders. Purchases for cherries are made by officers of Cooperative Café Timor (CCT) in each area or village with their own vehicle while parchments are directly purchased by middlemen and wholesalers. On the purchase of cherries and parchments, payment is made in cash, although payment may be delayed at the most in two or three days. This cash payment is also done in the transaction between middlemen to wholesalers in selling of parchments. Cooperative Café Timor (CCT) is the only wholesaler buying cherries directly from farmers in the Regency of Ermera while parchments are being accommodated by a few large traders such as Timor Corp., Timor Global, Café Lorosae and others. Coffee that has been accommodated by wholesalers is then processed into clean coffee beans (green beans) before it is sold to consumers or exporters. Buyers of coffee cherries and parchments do not find any problems in buying because the division of the area for each of the middleman is clear as well as the purchase of cherries coffee or red fruit. The problem faced by middlemen in general is the capital as well as limited drying and transportation facilities.

System of inter-agency network marketing cooperation: The production process of the plant, known as cultivation, is the main activities of farmers in generating product before marketing. Therefore, marketing would not exist if there is no product to be offered or sold. In terms of coffee production in Ermera Regency, most of the farmers harvest the coffee previously grown by their parents so they are not fully involved in activities such as planting while for marketing activities the farmers themselves involve other parties, namely coffee marketing agencies. Many farmers continue the farming started by their parents so there is no problem related to capital at the beginning of farming except in the expansion of coffee plants. However, the capital required to increase production especially for maintenance of the plants has always been a limiting factor because so far there have not been any financial institutions providing credit to coffee farmers in the Regency of Ermera.

Essentially, the function of farmer groups is not only limited to the activities of the production process but also serve as an institution that can accommodate farmers and distribute products to those agencies that need the products. It also happens to coffee farmers in this research area, in which cooperation of farmers is limited to coffee production activities such as harvesting and cleaning the farming areas in groups; however, these farmer groups are not working as expected in facilitating members of the group in marketing the farming product, i.e. coffee. In coffee marketing, there is no formal cooperation between marketing agencies and farmers but informally there is cooperation in the delivery of information such as the price of coffee cherries at the beginning of each harvest season by Cooperative Café Timor (CCT) and average price information of parchments for each region.

Close cooperation between middlemen and wholesalers is seen from the distribution of coffee from middlemen to only one wholesaler partner, as well as capital lent during harvesting time and the provision of transportation facilities. With the limitation the coffee farmers have, it is difficult to obtain information on the prevailing price as to assist them in determining the price of the coffee they sell. On the sale of coffee cherries, there is almost no bargaining because prices are set by Cooperative Café Timor (CCT) before harvesting time while for parchments farmers still have the option to delay the sale if the offered price is still too low. However, the delay to sell parchment normally does not last long because coffee farmers need money for their daily needs and prices tend to fall when coffee is stored in longer time. Thus, middlemen as the partners of wholesalers as well as the wholesalers always make big profit since wholesalers are experienced and have partners abroad as export destination.

Analysis on market performance: Market performance is the result obtained by each marketing agency through various marketing efforts to meet the satisfaction of the consumers. Market performance is also used as a benchmark to see how far the market structure and market conduct in the marketing of a particular commodity. In this study, the performance of the organic coffee market is analyzed or measured through the market efficiency employing a marketing margin, farmer's share and the ratio of costs and benefits.

Margin analysis and market efficiency: The purpose of the coffee marketing margin analysis is to determine the difference in the revenue earned by each of the agencies involved in the marketing of organic coffee to the final consumers and to know the prices received by producers. The total marketing margin is nothing but the amount of margin on each marketing agency. Marketing margin of every marketing agency is the difference of selling price and purchase price of products, so marketing margin can also reflect all of the costs incurred and the benefits acquired by each marketing agency. The amount of marketing margin of any marketing agencies depends on the economic activity and marketing functions performed by each of the coffee marketing agencies. Small margin value indicates that there is efficiency in the delivery of coffee by marketing agencies. Therefore, rationally determining the benefits acquired by each agency is required in order for the coffee sold to remain competitive with other competitors or in other words the price of coffee is made rational, affordable and remains appropriate with functions performed by its marketing agencies.

Analysis of marketing margins of organic coffee in Ermera Regency can be calculated by looking at the purchase price and the selling price of each coffee marketing agency. Coffee is sold by farmers in the form of coffee cherries to wholesalers and parchments to middlemen who then sell the parchments to wholesalers. This price already includes the cost of production and profits of

Table 6: Costs incurred and marketing margin in ermera Regency, 2013

| | Channel 1 | | | | Channel 2 | |
| | Arabica cherries | | Arabica parchments | | Robusta parchments | |
Marketing agencies	Cost/price USD kg^{-1}	Share (%)	Cost/price USD kg^{-1}	Share (%)	Cost/price USD kg^{-1}	Share (%)
Farmers sell	0.34	54	1.35	47	0.60	38
Middlemen						
Buy			1.35	47	0.60	38
Marketing cost			0.05	5	0.05	6
Profit			0.35	76	0.15	94
Selling price			1.75	61	0.80	5
Marketing margin			1.10		0.20	2
Wholesalers						
Buy	0.34	46	1.75	61	0.80	25
Marketing cost	0.21		0.99	95	0.784	94
Profit	0.08		0.11	24	0.016	10
Selling price	0.63		2.85		1.60	
Marketing margin	0.29		1.10	3.79	0.80	80
Total marketing margin	0.29		2.20		1.00	
B/C ratio	0.39	100	0.11		0.02	100

farmers. Costs incurred here refer to the cost of maintenance and the cost of harvesting. Processing cherries into parchments require some functions to be performed but it is not considered as a marketing expense but as a cost of production of parchments. The functions performed by the coffee farmers and traders in Ermera Regency are presented in Table 5. The functions performed by each marketing agency range from farmers as coffee producers to wholesalers in Ermera Regency. As a producer, farmers do not perform purchase functions while middlemen and wholesalers perform the functions of buying and selling.

In Table 5, it is explained that the coffee sold by the farmer is Arabica coffee cherries, Arabica and Robusta parchments with different prices. On the sale of cherries, farmers have a share on the selling price of 54% or farmers gain 54% from the sale of coffee cherries with no cost incurred for the activities of marketing functions while wholesalers share 46% of the selling price or smaller than the share by coffee farmers. In the second channel, for Arabica parchments, farmers contribute 47% of the selling price and for Robusta parchment they contribute to sales by 38%. This shows that in the sales of cherries, farmers have higher share than in the sale of parchments. On the marketing margin of cherries, wholesalers obtain USD 0.29 on every purchase of one kilogram of coffee cherries. As for the marketing costs incurred by each agency, marketing margin, the contribution made and the efficiency of marketing are described in Table 6.

CONCLUSION

The structure of the organic coffee market in Ermera Regency is not yet efficient, seen from the structure of the market that is in imperfect competition (oligopsony). The marketing agencies especially wholesalers have so much influence and are dominant in determining the price for both cherries and parchments. Coffee farmers and middlemen have not gained much information about the price of coffee on the international market as to enable them to analyze the current trend in the market. This is caused by the rather inefficient function of farmer groups in facilitating the marketing process of coffee produced by farmers; each farmer sells their coffee individually making

them to have a weaker bargaining position. Middlemen act merely on the behalf of wholesalers in purchasing coffee. The most inefficient marketing channel is the second channel in the marketing of Robusta parchments.

Wholesalers have the power to determine the price of both cherries and parchments. Some of the factors affecting this is the small coffee volume owned by every farmer, urgent needs of farmers on daily needs, limited processing machines owned by farmers, limited drying space making farmers to quickly sell their coffee and accept any prices offered by middlemen or wholesalers. Wholesalers or exporters represent the marketing agency that is very dominant in determining the price of coffee.

Market performance analysis also shows that this local coffee market is not yet efficient indicated by the evenly distributed margin share on both marketing channels; however, farmers have gained a better share price on the channel of cherries (56%) while on the second channel they still gain low share at both Arabica parchments (47%) and Robusta parchments (38%). This indicates that although farmers do the processing in the hope of obtaining a better price, this only leads to even lower share price level, compared to the share they gain by selling coffee cherries. Thus, the coffee farmers are not motivated to process their coffee, which actually does not only incur cost but also gives value added.

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