

Marketing channels of chili: players, levels, and segmentations

Joko Mariyono

Universitas Pancasakti, Tegal, Central Java, Indonesia

ARTICLE INFO

Article history:

Received 20 May 2019

Revised 20 September 2019

Accepted 20 September 2019

Available online 7 November 2019

JEL Classification:

M21; M31

Key words:

chili markets, intermediaries, agribusiness terminals

DOI:

10.14414/jebav.v22i2.1688

ABSTRACT

Chili production is an essential commodity in Indonesia, and the marketing issues frequently disrupt the economy. This paper aims to analyze the distribution channel of chili and formulate a suitable policy to overcome the marketing problems. A market survey was qualitatively conducted at a producer, intermediary, wholesaler, and retailer levels. The results were descriptively presented using tables and figures. The analysis shows that the marketing channel of chili in Indonesia was long and complicated. Many players were starting at the village level to the provincial level. Segmented markets were based on the types of chili, which were categorized as local and hybrid cultivars. Farmers selected the marketing channels because of business circumstance and their farm location. Distance and gentleman agreement with traders limited farmers to select the marketing channel. Thus, the government is strongly recommended to provide a unique vegetable market such as an agribusiness terminal close to the center of production. This action will shorten the marketing chain such that both producers and consumers gain the benefits. The role of the private sector will be crucial in order to keep healthy agribusiness.

ABSTRAK

Produksi cabai merupakan komoditas penting di Indonesia, dan masalah pemasaran sering kali mengganggu perekonomian. Penelitian ini bertujuan untuk menganalisis saluran distribusi cabai dan merumuskan kebijakan yang sesuai untuk mengatasi masalah pemasaran. Survei pasar dilakukan secara kualitatif di tingkat produsen, perantara, grosir dan pengecer. Hasilnya disajikan secara deskriptif menggunakan tabel dan gambar. Hasil analisis menunjukkan bahwa saluran pemasaran cabai di Indonesia rumit dan panjang. Banyak pemain mulai dari tingkat desa hingga tingkat provinsi. Pasar yang tersegmentasi didasarkan pada jenis cabai, yang dikategorikan sebagai kultivar lokal dan hibrida. Petani memilih saluran pemasaran karena kondisi bisnis dan lokasi pertanian mereka. Adanya perjanjian tak tertulis dengan pedagang dan jarak antara lokasi dan pasar membatasi petani untuk memilih saluran pemasaran yang lebih menguntungkan. Oleh karena itu, pemerintah direkomendasikan untuk menyediakan pasar khusus sayuran seperti terminal agribisnis di dekat pusat usahatani. Hal ini akan memperpendek rantai pemasaran sehingga menguntungkan bagi produsen maupun konsumen. Peran sektor swasta akan sangat penting dalam usaha untuk menjaga agri- bisnis yang sehat.

1. INTRODUCTION

The performance of agricultural marketing becomes an important theme because of its ability to trade harvests and reduce price fluctuation. When marketing activities are performed rightly, the productions are cleared by the market at a reasonable price. Failure in marketing leads to price fluctuation. From the supply side, the price

fluctuation is unfavorable to producers. If the price fluctuates much, farmers are discouraged from entering the market as they face a problematic prediction of the price when harvesting. This is because the main characteristics of agribusiness are the fact that producers respond to the current prevailing prices, and the outcomes will be gained a couple of months later. In particular, for

* Corresponding author, email address: mrjoko28@gmail.com

commonly perishable vegetables, timely marketing should be conducted once they start harvesting the farm.

In Indonesia, chili pepper is a valuable cash crop, providing income and livelihood benefits to several millions of smallholder farmers. Within Indonesia, Java Island is famous for the production of chili and the supply of chili to several other islands in the country. Chili was cultivated in over 175,000 ha of land in Indonesia and with the production of around 995,000 tons. Central Java province is one of the five provinces with top chili crop acreage in the country, with a total of 31,000 ha of chili area in Central Java alone, and with the average yield less than 6 tons per ha BPS 2014. Therefore, the characterization of production practices and socio-economic analysis of chili in Central Java carries a broad policy implication in the understanding of overall production and supply patterns of chili in Indonesia now.

The marketing of an agricultural product plays a central role in the process of agricultural commercialization. The commercialization, as a crucial feature of the development process, was perceived by most development economists. The commercialization shows a promising pathway from a semi-subsistence agricultural community to a more differentiated with high-valued commodities and confident food economy with higher standards of livelihood (Mariyono et al. 2017). Along with other business and household characteristics, transaction costs are the main restriction for farmers to market the produces (Osebeyo and Aye 2014).

There is still a problem that is hypothesized to inhibit the process of market participation by smallholder chili farmers in the vegetable producing regions of Indonesia. The problem perceived by farmers relates to marketing issues (Mariyono et al. 2018). The market is still inefficient where the harvested products have not been entirely sold in the market, and this leads to transaction costs.

Marketing margin is considered one of the transaction costs, which causes a gap between the price received by producers and the price paid by consumers (Wohlgenant 2001). Okoye et al. (2016) and Osebeyo and Aye (2014) find that the existence of transaction costs discourages farmers from participating in profit-oriented farming. The inclusion of smallholder farmers in more profitable markets could improve household welfare and reduce poverty among rural households (Mmbando, Wale, and Baiyegunhi 2017).

Given the very perishable nature of vegetables, along with the risks and potential sales volume of particular channels (LeRoux, Schmit, Roth, and Streeter 2010), the right selection of marketing channels is needed to maximize overall firm performance. From the supply side, the objective of this study is to analyse the distribution channel of vegetable sectors in Indonesia, its economic impact on the performance of vegetable sales, and the factor affecting marketing channels selected by farmers.

This study aims to illustrate production characteristics, socio-economic issues involved in chili cultivation, and market structures of chili in Central Java province of Indonesia.

2. THEORETICAL FRAMEWORK AND HYPOTHESES

Price fluctuation is one of the limiting factors in the development of the agribusiness sector. Highly fluctuated prices have been considered an important subject that provides necessary implications for forecasting and option pricing and risk management, among other economic and financial problems, since a long time ago (Baillie and Myers 1991; Bessembinder and Seguin 1993; LeRoux et al. 2010). For agricultural commodities, many factors cause price volatility, and there remains much work to be done in future extensions (Power and Turvey 2011).

In the vegetable sector, distribution channel varies, which depend on the farming scale and commercial purposes. There is a need for the distribution channels to sell the products of farmers at a rate that would offset their efforts and continue to keep them in business. This is due to the high risks taken by farmers associated with the perishability and seasonality of agricultural production (Imam, Chibok, and Gamama 2014). Furthermore, market transactions in large vegetable markets require high transparency. The reason is that buyers are located in remote places, and the volume of sales is very high (Modekurti 2016).

Contract farming is one of the distribution channels. This channel is unique because before cultivating the crops, an agreed transaction has been made by both producers and buyers. Earlier, contract farming has seen as a tool for creating new market opportunities hence increasing incomes for smallholder farmers. Nevertheless, contract farming is likely to pass risks to small-scale farmers, thus favoring large-scale farmers at the expense of smallholder farmers.

Contract farming has been considered as a pessimistic scenario in the marketing of agricultural products (Sachan, Sahay, and Sharma 2005). (Mwambi, Oduol, Mshenga, and Saidi 2016) show that participation in this scheme is not sufficient to improve household, farm, and income. According to Wang et al. (2014), the common belief that contracts are a risk management tool for risk-averse farmers, the risk-lovers tend to use contract farming instead of risk averters. In contrast, contract farming was determined by farmers' attitudes toward risk, gender, yield, farm-scale, and availability of labor. Larger farms are more likely to engage, but farms with more labors and women-headed households tend not to engage in the contracts. These suggest farmers' primary motivation of contracting is not market price risk management but instead seeking better offers and marketing transaction cost reduction. The inquiry remains regarding the efficient implementation of the arrangements to promote spill-over effects on other farm households.

There are other distribution channels other than contract farming. Farmers mainly selected farmers' market, cooperative, and wholesaler to sell their products, which comprised 96.57 percent of total sales. Cooperative, vegetable acreage, price satisfaction, and slow sales are the most critical factors positively influencing the probability of selecting to sell vegetables at a cooperative rather than at the farmer's market (Zhang et al. 2017). Various attempts to improve the vegetable markets lead to efficiency. For example, supermarkets play essential roles in connecting farmers to markets through direct transactions while enhancing farming practices of participating farmers in order to enhance the quality of produce (Srimanee and Routray 2012). For sustained growth of vegetables, the farmers must entrust the marketing procedural system. This is possible if farmers obtain the right price for their products. Buyers acquire high-quality goods at desired prices, which further encourage more buyers from other regions to participate in the process, stimulating an increased demand (Modekurti 2016).

Marketing margin that burdens producers and consumers is one of the crucial issues in the distribution channel. The higher the income collected by the player led by a higher level of marketing channel. In Malawi, a study suggests high margins accumulated to traders at the assembly level. On average, traders manage more volume than producers, thus generating their total margin higher as a proportion of the farmers'

margin. As such, only a few traders with transport facilities can reach remote areas where they gain monopolistic rents. Such high margins are often attributed to high perceived transaction risks in the remote areas that often boundary competition. Profit is very high compared to the profit that accrues to the producer. Tuffour and Dokurugu (2015) conclude that the higher the marketing margin burdens the market is because of, the longer the marketing channel. Carambas (2005) suggests that for a particular labeled commodity, the changes in demand rather than the changes in supply express most of the variations in margins.

The marketing cost coefficients and their significance are generally lower in labeled commodities than in conventional commodities. Tuffour and Dokurugu (2015) show three different market channels that exist simultaneously in the supply chain. Annually, wholesalers recorded a profit margin of 79.93%, retailers had a profit margin of 89.83%, and farmers just achieved a profit margin of 45.42%. It is an unsurprising outcome that retailers achieve at the highest efficiency and gain the highest incentives in the marketing chains.

3. RESEARCH METHOD

This study was performed in two districts of Central Java, Indonesia, i.e., Brebes and Magelang. Based on BPS (2015), about 35% of the total chili acreages in Central Java in 2014 were concentrated in these districts. Furthermore, Central Java is one of the largest chili-producing regions in Indonesia (BPS 2016). Thus, the selection of these areas is expected to represent the situation of the provincial level.

This analysis is from baseline survey exercise in the selected communities. The baseline survey adopted a framework of integration of qualitative and quantitative survey data to meet the above objectives. The qualitative survey approach was used for the collection of social and institutional issues involved in chili farming and the information at the community or group level average in the village surveyed. This includes tools and techniques of participatory rural appraisal such as key informant surveys, focus group surveys, and institutional mapping for assessing the importance of local institutions and agency factors on chili farming.

By using focus group discussions among knowledgeable chili farmers in the community, the researcher collected the information on history of chili farming and changes on key chili crop

production-related indicators in the village, crop cultivation practices, farm-level constraints and opportunities of chili cultivation, level of relative return and riskiness of chili farming from that of other commonly grown vegetables. The key informants include farmers, local traders, and government officials at the sub-district level.

Likewise, out of the broader set of the household-level survey done for baseline survey task, economic costs and benefits of production of chili and paddy were analyzed by taking farm statistics (inputs used and the output produced) and related detailed information from average representative households in sites. Using the farm survey data, we analyzed the average productivity, gross returns, net returns, and returns to farm family and management of chili production.

The assessment was based on farmers' group level survey carried out during February-June of 2017 in two communities each in Brebes and Magelang districts. Each of the communities/districts selected here has an intensive chili production area, and each site represents a distinct variation of production characteristic and agro-ecology settings of chili farming practice in the region. Samples for the surveys include Magelang of 70 households and Brebes of 80 households (Kersana=40 households, Klampok=40 households). Market surveys are conducted to trace the supply chain of chili, stemming from farmer households to final consumers in big cities of Indonesia.

4. DATA ANALYSIS AND DISCUSSION

Household and farm characteristics

Before presenting the primary outcomes of this study, it is interesting to show the characteristics of farmer households in the communities. Table 1 shows the household characteristics. On average, the farmers were about 45 years old, indicating that they were still in productive ages. Their level of education was just graduated from elementary school but dropped out of junior high school. For this current era, the level of education is considered low. This low education level might make it difficult for farmers to adopt and adapt to new technology (Xayavong, Kingwell, and Islam 2016).

Table 1
Characteristics of farmer households

Characteristics	Mean	St. Dev.
Age (year)	44.64	13.02
Education level (year)	7.47	3.18
Farming experience (year)	16.93	10.26
Chili experience (year)	4.93	2.80
Land acquisition (ha)	0.93	0.86

They had undergone general agricultural aspects for more than 15 years, but they had just experienced in chili farming for five years. Experience is an essential factor in business, including agribusiness, because it determines behavior toward risk (Feder and Savastano 2017). Chili farming is a risky business (Bhattarai and Mariyono 2009).

On average, the farmers held agricultural land almost 1 ha, which considered substantial if the land was devoted to chili farming. In fact, not all land held by farmers were allocated to chili farming (Mariyono and Sumarno 2015). It is drudgery to run intensive chili farming on a large scale. There are many required preparations and maintenances to keep the intensive chili farming in an excellent performance (Ali 2006, 2008; White 2007).

Chili is one of the commodities that have specialized and segmented markets. The characteristics of chili play an essential role in the success of marketing. One of the essential characteristics is a variety of chili. The variety brings specific indicators such as color, size, shape, and aroma. Each segment has a particular preference. When a particular variety of chili is marketed in the wrong segment, the price of such chili will be lower than usual. Even during peak season, the product is unacceptable to the market.

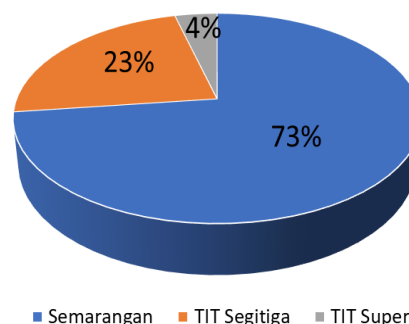


Figure 1
The most-cultivated varieties in Brebes

In Brebes, there were three types/varieties of chili, as shown in Figure 1. They called Semarangan, TIT Segitiga, and TIT Super. Semarangan is an improved, open-pollinated line of chili. The seed initially came from Semarang, a capital city of Central Java. Because farmers preferred to grow this line, farmers use the seed as planting material. Farmers did not purchase the seed because they kept some seeds from selected fruits of chili during harvesting. TIT Segitiga is named by farmers because of its shape that looks like triangles (segitiga means triangles). According to some farmers in Brebes, it was a hybrid cultivar developed by a Taiwanese seed company. However, farmers had carried out a trial and error of re-use the seed in many years such that it became a local seed. This is also the case for TIT Super. All three types of chili were considered local variety.

In Magelang, there were various varieties of chilli. However, the varieties can be sorted into two main groups: TM series and other varieties. TM series are curly chili, which consisted of, among others, TM999, TM99, TM88. Other varieties are big chili, which consisted of, among others, TW, Gada, Lado. Almost 95 percent of chili grown in Magelang were hybrid. Farmers should purchase the seeds from agricultural stores when they started cultivating chili, as shown in Figure 2

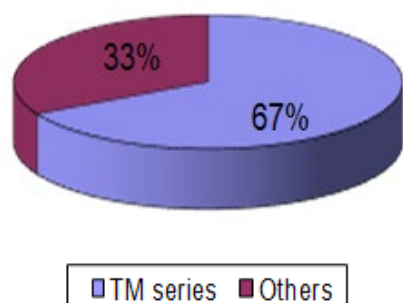


Figure 2
The most-cultivated varieties in Magelang

Market survey

Different types of chili have different markets. Figure 3 shows the distribution channel of chili in Magelang. At the district level of Magelang, of the total production of chili, 20% of production was devoted to local consumption, 80% of production was sent to other cities such as Jakarta, Batam, Surabaya, Pontianak, Semarang, and Jogjakarta. In Magelang, there were at least six big chili traders. They have different markets to sell chili. The destinations included Jakarta/Bogor, Bandung, Pontianak, and Semarang.

There was an agribusiness terminal in Magelang. Farmers and small traders could sell directly to buyers from cities surrounding Magelang. There were also peddlers, traders with a motorcycle to buy chili and other vegetables from the station, and then they sold the vegetables in other cities. The number of peddlers was around 30 a day, and the frequency of peddlers was twice a day. Every peddler carried 100-200kg of vegetables, including 10-20 kg of chili. In the station, there were big traders. Usually, the big traders would buy chili from the station and conducted grading before selling to other big cities. Chili was transported using trucks if it was sold within Java, planes if it sold to West Sumatra and Batam Island, and ships if it sold to Kalimantan, which takes 26-32 hours.

At the village level, chili from a village was brought to local assembly markets, and then from the market, chili was sold by big traders to several markets in other cities surrounding Magelang: Jogjakarta, Semarang, and Purworejo. Chili was transported using a small car (colt). Significant chili types included TM999 (curling chili), which was priced at about Rp10,000/kg, and Lado (big chili, less bright in color), which was priced at about Rp9,000/kg. During normal seasons, the price of chili ranged around Rp9,000-13,000/kg. As the price of chili was very volatile, the price could drop to Rp5000/kg during peak seasons and could rise up to Rp50,000/kg during off-seasons.

The process of trading chili at the village level was started from farmers who harvested chili in the morning. When the volume of the harvest was high, farmers brought their harvest to the "bakuls" or local collectors. However, when the volume of the harvest was low (not in the season), the "bakuls" collected chili from farmers. The "bakuls" set the price based on the previously prevailing price. The "Bakuls" brought chili to the market in the very early morning using public transportation with a transportation cost of Rp5, 000 for 50kg of chili.

There were two types of transactions: cash and credit. The former, when the "bakuls" made a transaction with farmers, they paid directly in cash. If the price in the market was high, the "bakuls" could gain, and conversely, when the price in the market was low, the "bakuls" could suffer from the loss. The later, price was based on the prevailing market price, and then farmers got the payment a day later. This case is similar to that in Sri Lanka, when the producer price and retail prices increase, the margin decrease, and vice versa. It is clear that when the retail price and producer prices rise, the middlemen try to control the market prices by

reducing their marketing. It may support to protect the consumers directly because producer price and retail prices ordinarily increase because of the low supply of the production of vegetables and/or high demand. When the prices drop, they try to get more benefits by increasing their margin as a rational business player (Sandika and Dushani 2009).

Identified issues related to the supply chain of chili were that information on price was late, and public transportation was still limited. Farmers were frequently late to bring chili to the market, such that buyers have gone, and farmers sold local collectors at a lower price. Figure 4 shows the distribution channel of chili in Brebes. At a district level in Brebes, chili was mostly traded in a big chili market. There were two big chili markets in Brebes. The

markets were places to sell chili from Kemukten, Limbangan, Losari, Kersana, Tanjung, Bulakamba, and Banjarharjo. In the big chili market, there were some market players. These included small collector, who directly collected chili from farmers; centeng/ingser, which bought chili from small collectors with marketing margin of about Rp500-Rp1000/kg; local prominent trader, which collected chili from small collectors and farmers; big trader from other cities that purchased chili from local big traders; dacin, which provided a service of measuring the weight of chili got profit of 2 kg of chili from 100 kg; and lastly commissioner who facilitated buyers and traders with an agreed commission.

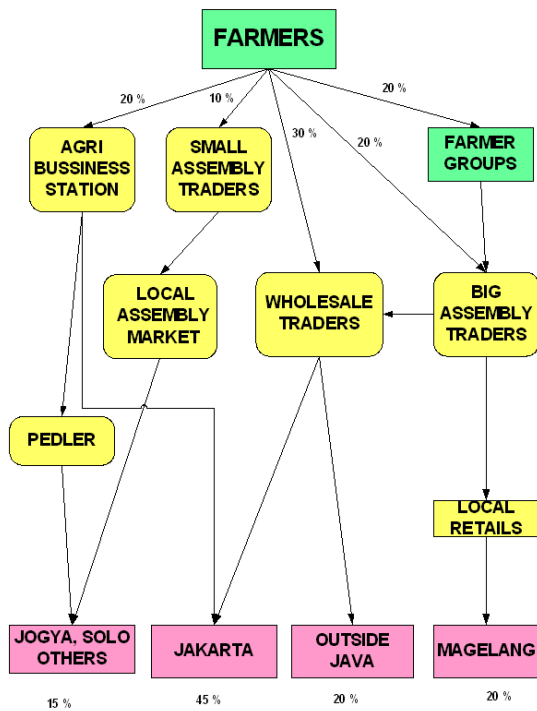


Figure 3. Chili market structure in Magelang

In Brebes, farmers traded chili to collectors (assembly traders) in the village, and the collector sent to big traders from Bandung (40%), Bogor (20%), and Jakarta (30%) via representative traders in Tanjung market. The rest was sold for local consumption and other areas, including outside Java. In this case, farmers had choices of traders to sell chili. The first one was via local collectors (60%). The second was direct to a big trader (40%). Usually, the big traders came to a village to buy chili. These traders already had a contract with farmers because farmers got credit from the traders. The price was set

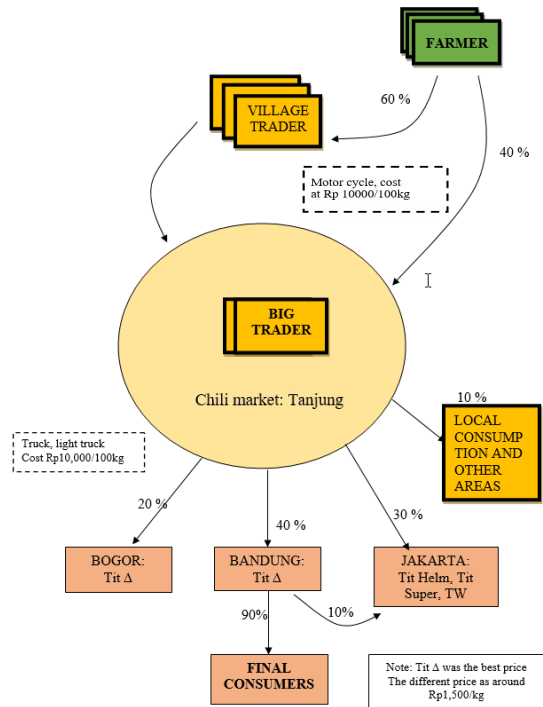


Figure 4. Chili market structure in Brebes

by the traders, which was usually around Rp1,000-2,500/kg below the prevailing market price. Farmers had a contract because the traders provided a loan as operating capital requirements.

In Brebes, the types of chili traded were curling chili and big chili. Each type of chili had different markets and prices. Tit Super priced at Rp10,500/kg was sold in Jakarta and Bandung; Tit Segitiga priced at Rp9,000/kg was sold in Bandung; Tit super priced at Rp9,000/kg were sold in Cirebon and Bogor. Other types were sold in local retail markets priced at cheaper than other types.

The market share of chili was about 80% in Java, and 20% outside Java. In Semarang, some amount of chili was sold to the food processing industry via a particular supplier. A cell phone has been used for communication among farmers and traders in both within Brebes and outside. It was very occasional that farmers sold directly to the wholesalers or end-users, such as food processing companies. Farming distance (or location) and the scale of farming were supposed to be the cause of the selection of marketing channels.

There was an unwritten rule in the market that farmers were not individually allowed to sell the products directly to end-users. Unlike in West Java, the producers that are close to the capital cities of Indonesia, the farmer's committed verbal agreements rather than written agreements with dedicated wholesalers. The agreements covered price, payment period, quantity, product specification, and seed/other inputs provided on credit (Sahara and Gyau 2014).

Mostly, the end-users were supplied with chili from wholesalers and inter-province markets. Wholesalers play roles as intermediaries by organizing teams of local traders to assemble products from farmers and by selling to supermarkets. They do the business by selling a specific or very few products to different players. Alternatively, they sell a wide variety of products to players from a specific marketing channel (Hernández, Reardon, Natawidjaja, and Shetty 2015). In some cases, they make agreements with supermarkets and along with their traders, are responsible for managing farmers by providing them with the required information on preferred timing, quality, shape, varieties, and sizes while providing farmers with assistance related to management production practices.

Discussion

From the market surveys in Magelang and Brebes, it is worth discussing this study by referring to other research outcomes. There are many factors of marketing issues that determine the success of agribusiness based on vegetable farming. The aspects include marketing constraints, behaviors of farmers in selling the products, access to market information, and the number of traders.

There are many sources of market information accessed by farmers. Local traders and neighboring farmers were the most favored sources of market information, particularly for the prevailing price of vegetables. Farmers frequently traded the produces to their customers, but there was not an exclusive

arrangement between farmers and the customers. Farmers sold the products immediately after harvesting due to the perishability of the products. Farmers tried to get prevailing market prices within three days before harvesting, and farmers attempted to get better prices by negotiating with traders. Less than half of the farmers used a mobile phone in marketing activities (Mariyono et al. 2018). In short, the main drivers for farmers to engage in marketing and sales are the reduction in cost and growth of farming (Rezaei, Ortt, and Trott 2018).

Marketing distribution is illustrated principally by relational contracts between farmers and their buyers. It also highlights a vertical integration by some buyers and growers selling on informal markets. The outcomes of marketing distribution are attributed mainly to the absence of adequate standards and legal systems (Bhattarai, Lyne, and Martin 2013). Farmers need to make a timely decision on where they should trade the products once their farming enters the harvesting stage. With the existing marketing outlets, farmers access one of them based on several considerations.

Failure in selecting the outlets leads to suboptimal outcomes. Wang et al. (2014) suggest that in different market arrangements, decentralized supply chains do better than integrated chains when product substitutability reaches a certain acceptable level. The suppliers and customers have little or virtually no role in demand management, inventory management, and product development processes. The engagement rate of suppliers and customers varies across different supply chain processes and also across different sectors (Sahay 2003).

To sum up, the distribution channel of chili has a vital role in the development of farming as one of the main complications to market development is the relatively low availability of the local community. Market development depends on how farmers will recognize how to choose an optimal distribution channel for their products. For small farmers, it is recommended keeping a close link with the final customer, using distribution channels directly, without intermediaries such as peasant markets and shops at the farm gate. If large farms produce crops that require special storage conditions, it is recommended the use of indirect distribution channels, through which can be sold large quantities of goods. These channels are the supermarkets, specialized organic shops, processors, and various intermediaries (Atănăsoaie 2011). Proper selection of distribution channels will benefit farmers to get a reasonable price, and this leads to improved welfare. Mmbando et al. (2017) show that

farmers' participation with buyers close to markets and wholesalers adjacent to towns have a positive effect on consumption expenditure per capita relative to brokers at the farm-gate, for both maize and pigeon pea-farming households. Several policy gaps are still present to hinder the interests of the farmers in achieving the maximum benefits and in the areas of participation between public and private sectors (Srimanee and Routray 2012). Through appropriate interventions that improve the development of private traders, thus enhancing the structure of markets, it is possible that some of the margins that are captured by the traders could be passed on to the producers, thereby improving the farm-gate prices. This, however, is linked to the extent and quality of public goods, such as access roads. The current study is expected to fill the gap, particularly for the producer side.

5. CONCLUSION, IMPLICATION, SUGGESTION, AND LIMITATIONS

Chili plays an essential role in the Indonesian economy because the commodity serves as the basic necessity that is consumed daily and in fresh form. The economic value of chili is significant. For the supply side, chili generates income for producers because intensive chili farming is more profitable than other cereal crops. Moving on from its subsistence to profit-oriented farming helps rural people improve their welfare resulted from high income generated from farming. However, there is a marketing issue that impedes producers to obtain optimal income from farming. The issue is related to the inefficiency of the distribution channel in the chili market. This study finds long supply chains in the marketing of chili. There were four different levels of intermediaries in the distribution channel. The four intermediaries collected a certain economic margin when they wholesaled vegetables to end-users. The existence of the intermediaries could affect the performance of chili farming. Farmers got a low price, and this discouraged them from producing more such that the sales declined. Farmers perceived the distance from the big market as the cause of why they sold the produce to local collectors.

There was enough room to improve the performance by providing specialized training for producers, along with the use of telephone, affected farmers to select a better marketing channel. As the distance was perceived as the main culprit, it is relevant to improve transportation and market infrastructures, such that the transportation cost decreases. It is also wise for the government to

establishes agribusiness terminals in every chili-producing region. At the local level, the existing cooperatives need revitalization and replace the local collectors. As the cooperatives belong to farmers, the marketing margin collected by the cooperatives can be set at a reasonable level, and eventually, the share of profit gained by the cooperatives belongs to farmers. This should be accompanied by a regulation that controls local collectors to operate in the agribusiness terminals.

This study has several limitations related to study locations concentrated in several sub-districts. Chili pepper has been cultivated in many sub-districts. The relatively homogeneous farming practices within each district minimize the bias; thus, a comparison between two districts still represents characteristics of chili marketing.

REFERENCES

- Ali, M 2006. *Chili (Capsicum spp.) food chain analysis: Setting research priorities in asia*, AVRDC-WorldVegetableCenter.
- Ali, M 2008, 'Horticulture Revolution for the Poor: Nature, Challenges, and Opportunities. A background paper prepared for IAAST World Development Report/World Bank.
- Atănăsoaie, G 2011, 'Distribution channels on the organic foods market', *Journal of Horticulture, Forestry and Biotechnology*, vol. 15, no. 3, pp. 19-25.
- Baillie, RT & Myers, RJ 1991, 'Bivariate GARCH estimation of the optimal commodity futures hedge', *Journal of Applied Econometrics*, vol. 6, no. 2, pp. 109-124.
- Bessembinder, H & Seguin, PJ 1993, 'Price volatility, trading volume, and market depth: Evidence from futures markets', *Journal of financial and Quantitative Analysis*, vol. 28, no. 1, pp. 21-39.
- Bhattacharai, Lyne, M, & Martin, S 2013, 'Assessing the performance of a supply chain for organic vegetables from a smallholder perspective', *Journal of Agribusiness in Developing and Emerging Economies*, vol. 3, no. 2, pp. 101-118.
- Bhattacharai & Mariyono, J 2009, 'Socioeconomic analysis and participatory risk assessment of chilli cultivation in Central Java, Indonesia', *Horticultural Economics & Management Newsletter*, vol. 9, pp. 11-17.
- BPS 2015, 'Jawa Tengah Dalam Angka'. Jakarta: Badan Pusat Statistik.
- BPS 2016, 'Indonesian Horticultural Statistics'. Jakarta: Badan Pusat Statistik.

- Carambas, MCD. (2005). *Analysis of marketing margins in eco-labeled products*. Paper presented at the presentation at the XIth Congress of the EAAE (European Association of Agricultural Economists), 'The Future of Rural Europe in the Global Agri-Food System', Copenhagen, Denmark.
- Feder, G & Savastano, S 2017, 'Modern agricultural technology adoption in sub-Saharan Africa: A four-country analysis' *Agriculture and Rural Development in a Globalizing World* (pp. 11-25), Routledge.
- Hernández, R, Reardon, T, Natawidjaja, R, & Shetty, S 2015, 'Tomato farmers and modernising value chains in Indonesia', *Bulletin of Indonesian Economic Studies*, vol. 51, no. 3, pp. 425-444.
- Imam, YB, Chibok, BM, & Gamama, Y 2014, 'Channels of distribution of agricultural produce in Nigeria', *Channels*, vol. 4, no. 22, pp. 62-66.
- LeRoux, MN, Schmit, TM, Roth, M, & Streeter, DH 2010, 'Evaluating marketing channel options for small-scale fruit and vegetable producers', *Renewable agriculture and food systems*, vol. 25, no. 1, pp. 16-23.
- Mariyono, J, Dewi, HA, Daroini, PB, Latifah, E, Zakariya, AZ, & Afari-Sefa, V 2018, 'Marketing Aspects of Vegetables: Comparative Study of Four Regions in East Java and Bali', *Agriekonomika*, vol. 7, no. 1, pp. 46-56.
- Mariyono, J, Kuntariningsih, A, Dewi, HA, Latifah, E, Daroini, PB, Negro, AA, . . . Luther, G 2017, 'Pathway analysis of vegetable farming commercialization', *Economic Journal of Emerging Markets*, vol. 9, no. 2, pp. 115-124.
- Mariyono, J & Sumarno, S 2015, 'Chilli production and adoption of chilli-based agribusiness in Indonesia', *Journal of Agribusiness in Developing and Emerging Economies*, vol. 5, no. 1, pp. 57-75.
- Mmbando, FE, Wale, EZ, & Baiyegunhi, LJ 2017, 'The welfare impacts of market channel choice by smallholder farmers in Tanzania', *Development in Practice*, vol. 27, no. 7, pp. 981-993.
- Modekurti, DPV 2016, 'Automation of modified marketing procedural system to maximize transparency: A case study of vegetables in Madanapalle market', *Journal of Agribusiness in Developing and Emerging Economies*, vol. 6, no. 1, pp. 72-88.
- Mwambi, MM, Oduol, J, Mshenga, P, & Saidi, M 2016, 'Does contract farming improve smallholder income? The case of avocado farmers in Kenya', *Journal of Agribusiness in Developing and Emerging Economies*, vol. 6, no. 1, pp. 2-20.
- Okoye, B, Abass, A, Bachwenkizi, B, Asumugha, G, Alenkhe, B, Ranaivoson, R, . . . Ralimanana, I 2016, 'Effect of transaction costs on market participation among smallholder cassava farmers in Central Madagascar', *Cogent Economics & Finance*, vol. 4, no. 1, pp. 1143597.
- Osebeyo, SO & Aye, GC 2014, 'Transaction costs and marketing decision: a case study of smallholder tomato farmers in Makurdi, Nigeria', *Urban, Planning and Transport Research*, vol. 2, no. 1, pp. 333-340.
- Power, G & Turvey, C 2011, 'What explains long memory in futures price volatility?', *Applied Economics*, vol. 43, no. 24, pp. 3395-3404.
- Rezaei, J, Ortt, R, & Trott, P 2018, 'Supply chain drivers, partnerships and performance of high-tech SMEs: An empirical study using SEM', *International Journal of Productivity and Performance Management*, vol. 67, no. 4, pp. 629-653.
- Sachan, A, Sahay, B, & Sharma, D 2005, 'Developing Indian grain supply chain cost model: a system dynamics approach', *International Journal of Productivity and Performance Management*, vol. 54, no. 3, pp. 187-205.
- Sahara, S & Gyau, A 2014, 'Contractual arrangements and commitment in the Indonesian supermarket channel', *British Food Journal*, vol. 116, no. 5, pp. 765-779.
- Sahay, B 2003, 'Supply chain collaboration: the key to value creation', *Work study*, vol. 52, no. 2, pp. 76-83.
- Sandika, A & Dushani, S 2009, 'Growth performance of rice sector: the present scenario in Sri Lanka', *Tropical Agricultural Research and Extension*, vol. 12, no. 2, pp. 71-76.
- Srimanee, Y & Routray, JK 2012, 'The fruit and vegetable marketing chains in Thailand: policy impacts and implications', *international Journal of retail & distribution Management*, vol. 40, no. 9, pp. 656-675.
- Tuffour, M & Dokurugu, MT 2015, 'Margins and efficiency analysis of watermelon Marketing in Rural Northern Ghana', *IOSR Journal of Business and Management*, vol. 17, no. 2, pp. 58-63.
- Wang, R, Zhao, S, Song, W, Cacciolatti, L, Zhang, X, Sausman, C, & Fu, Y 2014, 'Determination of the effect of product substitutability on sales performance of integrated and decentralised

- supply chains through Nash equilibria', *International Journal of Productivity and Performance Management*, vol. 63, no. 7, pp. 863-878.
- White, B 2007, 'Vegetable Value Chains in Eastern Indonesia: A Focus in Chilli: SADI-ACIAR Research Report': Australian Government, Australian Centre for International Agricultural Research.
- Wohlgemant, MK 2001, 'Marketing margins: Empirical analysis' *Handbook of agricultural economics* (Vol. 1, pp. 933-970).
- Xayavong, V, Kingwell, R, & Islam, N 2016, 'How training and innovation link to farm performance: a structural equation analysis', *Australian Journal of Agricultural and Resource Economics*, vol. 60, no. 2, pp. 227-242.
- Zhang, B, Fu, Z, Wang, J, Tang, X, Zhao, Y, & Zhang, L 2017, 'Effect of householder characteristics, production, sales and safety awareness on farmers' choice of vegetable marketing channels in Beijing, China', *British Food Journal*, vol. 119, no. 6, pp. 1216-1231.