

# Off Season Planting System as Supply Function in Chili Pepper Availability

(An Analysis of Rational Expectation Model in Red Curly Chili Pepper Farming (Capsicum Annum L) in Cikajang, Garut Regency)

Dety Sukmawati\*, Euis Dasipah

Agribisnis  
 Universitas Winaya Mukti  
 Sumedang, Indonesia

\*detyukmawati@ymail.com, dasipah@gmail.com

**Abstract**—Chili pepper is one of national leading commodities and has a high economic value. One of the factors causing the balance is unplanned and uncoordinated pattern of production and cropping pattern between each district of chili pepper production center resulting the fluctuative income. These research was quantitative research, data collection was done by means of a survey of time series. The data used are time series data and supporting data which come from: Information center of price at production center, and price information at West Java Food Crop Agriculture Agency. From the amount of data (included observation) which amounted to 72 data. The technic analyzed used multivariate. The rational expectation hypothesis of the supply function was analyzed by the EVIEWS 8 program. The analysis results of planting system was the selection of monoculture plant system will increase the harvested area 31,4462 hectares, analysis results showed more farmers planted red curly chili pepper in monoculture system, but the red curly chili pepper in Cikajang has performed off season planting system, it means that the farmers cultivated red curly chili most of the year.

**Keywords:** *planting system, off season, availability of chili pepper*

## I. INTRODUCTION

Chili is a strategic vegetable commodity, both red chili and cayenne pepper. In certain seasons, chili price increases are significant enough to affect inflation. This price fluctuation occurs almost every year and is disturbing the public, but there is no concrete solution from the government to control the price spike [1]. Indonesian people's preference for chili is proven by the per capita need for chili which is in the range of 3 kg / capita / year. If the population of Indonesia is 250 million, this means that 750,000 tons are needed annually. This amount is not expected to be fulfilled by domestic production, especially in the last few years [2].

The high demand for fresh chilies and chilies for industry has not been able to be offset by the availability of domestic chili production by farmers. West Java is one of the largest producers in Indonesia and even occupies the second highest position after Central Java [3].

Chili is a national and regional superior vegetable commodity. Leading commodities are commodities that are feasible to be cultivated because they provide benefits to farmers, both biophysically, socially and economically. Garut Regency as the main production center for chili commodities with the highest amount of production in West Java requires a strategy in creating chili commodities that are competitive in competitiveness if they are cultivated according to their agroecological zones [4].

In general, the problems faced in the development of Red Chili farming, especially in the area of Red Chili production centers, are not yet realized the variety, quantity, quality, and sustainability of supply in accordance with market demand and consumer preferences. For this reason, a comprehensive policy analysis needs to be carried out on the determinants that influence the lack of supply of Red Chili and the phenomenon of price surges in order to develop appropriate policy alternatives so that chili supply can be fulfilled at any time in accordance with the dynamics of market demand [5].

Off season chili commodity development has a higher chance in upland dry land because rainfall distribution patterns are relatively more even when compared to lowland paddy fields [6].

## II. RESEARCH METHODS

These research was quantitative research, data collection was done by means of a survey of time series. The data used are time series data and supporting data which come from: Information center of price at production center, and price information at West Java Food Crop Agriculture Agency. From the amount of data (included observation) which amounted to 72 data. The technic analyzed used multivariate. The supply function was:

$$LP_c = a_0 + a_1 Pf + a_2 PD_{t-1} + a_3 ST \dots\dots\dots (1)$$

$LP_c$  = LUAS\_PANEN\_Ha (Hectare)/harvested area curly pepper (hectares)

$Pf$  = H\_PETANI /Price on farmer (Rupiahs)

$PD_{t-1} = H\_PPK \text{ DASAR} / \text{fertilizer price (Rupiah)}$

$ST = \text{SITIM\_TANAM}$ , (1= sisipan, 2 = monokultur, 3 = *tumpangsari*) / Planting system (1=Insert cropping, 2=Monoculture, 3=Multiple cropping)

The rational expectation hypothesis of the supply function was analyzed by the EVIEWS 8 program.

### III. RESULTS AND DISCUSSION

The results of the analysis for planting system is the selection of monoculture plant system will increase the harvested area of 31,4462 hectares, analysis results show more farmers plant red curly pepper monoculture. The choice of planting system is based on the purpose of risk coverage, farmers plant red curly pepper with inserts and intercropping with the aim of reducing the risk of business. The development of the price of red chili pepper in Cikajang production center is not influenced by the supply or the number of products, because the red pepper plant in Cikajang already doing off season. Meaning that the farmers cultivate curly red peppers for most of the year and some farmers grow red curly peppers by means of inserts and intercropping, this ensures the availability of the product for a year, in terms of the area the condition is commonly called *nyirem*. This is in accordance with the opinion of Wiranto in the Ministry of Trade of the Republic of Indonesia, 2012, that there are several technologies that are applied in cultivating chilies that are cultivation technology off season to maintain the continuity of production and maintain price stability.

The supply in the rational expectation model is a function of supply which the forming variable is harvested area as dependent variable and independent variable consists of farmer price, basic fertilizer price and planting system. The harvested area is the area of red curly chili plants harvested by farmers in hectares. Farmers price is the price of red curly pepper prevailing in Cikajang production center. Basic fertilizer used by farmers for red curly pepper plant is ZA fertilizer and NPK. ZA fertilizer in 2 years has increased from Rp.1.400 to Rp.1.600 in 2015, NPK fertilizer (*kujang* / petro) has increased the price from Rp.2.200 to Rp.2.300. Planting system is the activity of farmers in planting red pepper curly in Cikajang there are 3 kinds of monoculture, inset and multiple cropping. Varieties of red curly chili planted by farmers consist of Bianca, Siramping, Redsabel, TM 99, Alligator, Kaka and Phoenix. From the amount of data (included observation) which amounted to 72 data, while the results of the analysis can be seen in the equation below:

$$\text{LUAS\_PANEN\_Ha} = - 990.786324648 - 0.00389351848518 * H\_PETANI + 0,679421255692 * H\_PPK \text{ DASAR} + 31.4462758864 * \text{SITIM\_TANAM}$$

The equation shows that:

- Price on farmer/H\_PETANI (-0.00389351848518\*H\_PETANI): if the price of red curly pepper in the farmer 1 rupiah will decrease the harvest area of 0.0038 hectares of red curly pepper harvest area, this is in accordance with the theory if

there is a decrease in production (supply) it will raise the price.

- Fertilizer price/H\_PPK DASAR (+0,679421255692\*H\_PPK DASAR). Each basic fertilizer price of 1 rupiah will increase the harvested area of 0.6794 hectares (an increase of 67% of the harvested area), meaning that the increase in the price of basic fertilizer means increased production. This shows that the farmers do the fertilization of their crops despite the increase of fertilizer price, when the fertilizer price increase in the next 2 years, and the increase of fertilizer price is accompanied by the increase of harvest area, something that is required when viewed from the economic efficiency, it means that the cost increase must be accompanied Increased production if the red pepper cultivation does not want to lose.
- Planting system/SITIM\_TANAM (+31.4462758864\*SITIM\_TANAM). The result of analysis for planting system is monoculture plant system selection will increase the harvest area 31,4462 hectare, because plant system variable is monoculture variable which is given score 1, the inset is given score 2 and *tumpangsari* given score 3, analysis result show more farmers planting red chili Kinks in monoculture. The choice of planting system is based on the purpose of risk coverage, farmers plant red curly pepper with inserts and intercropping with the aim of reducing the risk of business. In fact, farmers who grow multiple cropping are the application of the principle of business combination (combining enterprises) for some farmers is done to reduce the risk of business failure and to increase income, especially on farmers whose land area is narrow.

The findings of these study were in accordance with Wiranto in the Ministry of Trade Republic of Indonesia, 2012, The development of chili prices in Indonesia is strongly influenced by weather conditions. Rainfall is too high is not good for pepper plants, resulting in the plant becomes moist, quickly rot, easily fall fruit and prone to disease. Rainfall is too low even cause the plants dry and easy to wilt. Therefore, the need for a solution to overcome this. There are several technologies applied in cultivating peppers. Technology cultivation off season to maintain continuity of production and maintain price stability.

The development of the price of red pepper in the production center Cikajang actually not influenced by the supply or the number of products, because the red curly pepper plant in Cikajang already done off season. Meaning that farmers cultivate curly red peppers almost all year long although there are cropping patterns of Tomatoes - red curly peppers, but some farmers grow red curly chili by means of insertion and intercropping, this guarantees the availability of the product for a year, in terms of the area of the condition is commonly called *nyirem*.

The development of red curly pepper production in Garut Regency that can be seen on planting area and harvest area. The planting area in 2009 to 2010 has increased and decreased by harvest area, but in 2011 there was a decrease of planting

area but the area of harvest increased, it can happen because many farmers who planted red curly chili and good climate that resulted in the increase of harvest. The harvested area is higher than the planted area due to the previous harvesting area cultivated in the current harvest area, sourced from the West Java Food Crops Agency showing the planting area in October-December 2014 and the harvested area recorded January - December 2015 at Harvested area occurs the addition of harvested area from the previous planting season due to the planting pattern of red curly chili planted 7 months with 12 times harvest, allowing the addition of harvested area on the previous planting area.

The development of production and price of curly red pepper in Cikajang in 2014 Shows that for 5 years following the same pattern that if production increases then prices will fall, and if production goes down then prices will rise. This pattern still shows in accordance with the rules of demand and supply, assuming other things are the same. These are factors affecting demand (the price of the goods itself, the prices of other goods, household income, the pattern of income distribution, the taste of society, the number of people and the forecast of future circumstances), and several factors that Affect the supply (the price of the goods itself, the price of other goods, the cost of production, the company's operating objectives, and the level of technology used).

#### IV. CONCLUSION

The results of the study show that: Planting system is the selection of monoculture plant system will increase the harvested area 31,4462 hectares, analysis results show more farmers to plant curly red pepper monoculture. Farmer must monoculture planted. Although farmers grow red curly pepper with inserts and intercropping with the aim of reducing the risk of business .The development of the price of chili pepper (curly

red pepper) in the production center Cikajang actually not influenced by the supply or the number of products, because the red curly pepper plant in Cikajang has done off season, meaning that farmers cultivate red curly chili almost all year and some farmers plant red curly chili Inserts and intercropping, this guarantees the availability of the product throughout the year, in terms of the area the condition is commonly called *nyirem*. This is in accordance with the opinion of Wiranto in the Ministry of Trade of the Republic of Indonesia, 2012, that there are several technologies that are applied in cultivating chilies that are cultivation technology off season to maintain the continuity of production and maintain price stability.

#### REFERENCES

- [1] A.L. Sayekti and Y. Hilman, "Dinamika Produksi Dan Volatilitas Harga Cabai : Antisipasi Strategi Dan Kebijakan Pengembangan Production Dynamics and Price Volatility of Chili Anticipation Strategy and Development Policy," *Pengemb. Inov. Pertan.*, vol. 8, no. 1, pp. 33–42, 2015.
- [2] D.S. Siahaan, K. Tarigan, and T. Sembayang, "Efisiensi Penggunaan Faktor Produksi Usahatani Cabai Merah ( Capsicum Annum L. )," *Universitas Sumatra Utara*.
- [3] S.A. Andayani, "Faktor-Faktor Yang Mempengaruhi Produksi Cabai Merah," *Mimb. AGRIBISNIS J. Pemikir. Masy. Ilm. Berwawasan Agribisnis*, vol. 1, no. 3, pp. 261–268, 2016.
- [4] S. Tsurayya and L. Kartika, "Kelembagaan Dan Strategi Peningkatan Daya Saing Komoditas Cabai Kabupaten Garut," *J. Manaj. dan Agribisnis*, vol. 12, no. 1, pp. 1–12, 2015.
- [5] A.N.K. Saptana and A.M. Ar-Rozi, "Kinerja Produksi Dan Harga Komoditas Cabai Merah," *Pse Litbang Pertan. Gold*, vol. 5, pp. 1–10, 2008.
- [6] C. Muslim and S.H. Susilowati, "Agroekosistem Lahan Kering Di Jawa Timur Chili Supply Chain Management in Dryland Agroecosystem in East Java," *Anal. Kebijak. Pertan.*, vol. 16, no. 1, pp. 19–41, 2018.