Scientific Journal of Reflection: ISSN 2615-3009
Economic, Accounting, Management and Bussines
Vol.1, No. 2, April 2018

THE EFFECT FACTORS OF SUPPLY SALT IN INDONESIA

Rusdi
Universitas Pamulang, Banten
email: rusdi.msi@gmail.com

ABSTRACT

This study aims to analyze the factors that can affect the supply of Indonesian salt. The method used is quantitative method using ordinary least squares (OLS) with a multiple linear regression model. The type of data to be used in this study using secondary data time series year 2000-2014. The data are taken from a variety of sources, including the Central Bureau of Statistics, Ministry of Commerce, Ministry of Industry, Ministry of Maritime Affairs and Fisheries and other resources related to the research. The results of this study showed that the factors that significantly affect the salt deals in Indonesia is the rainfall and the PUGAR and technology not significantly. Negative coefficient of rainfall that can be explained that when there was an increase in precipitation will result in salt deals in Indonesia will go down. While the PUGAR can increase the supply of salt

Kaywords : Rainfall, Technolgy, PUGAR Policy

PROEM

Ministry of Marine Affairs and Fisheries (KKP) stipulates the fulfillment of national consumption salt needs as one of the priorities in marine economic development. Salt is one of strategic commodities that is very potential and has not been well cultivated. Indonesia has a coastline length of 81,000 km which means the second longest coastline after Canada. Indonesia should be a salt exporting country, or at least be self-sufficient, but in reality it is not.

In general, salt in Indonesia is produced by salt farmers and PT Garam. PT Garam is the only state-owned enterprise (BUMN) in charge of salt commodity. The company, which owns only production land in Madura, controls about 5 130 hectares of salt land with production in 2009 reaching 319 000 tons or 30 percent of total national salt production (Ihsannudin, 2012). Meanwhile, according to the Ministry of Marine Affairs and Fisheries (KKP) in 2011 salt farmers have land scattered in some areas such as Nanggroe Aceh Darussalam (279 ha), West Java (3 700 ha), Central Java (6 148 ha), East Java (5 184 ha), Bali (114 ha), East Nusa Tenggara (221 ha), West Nusa Tenggara (2 290 ha), Central Sulawesi (18 ha) and South Sulawesi (1 513 ha). In other words, the total land area owned by farmers reaches 70 percent of the total domestic salt land area.

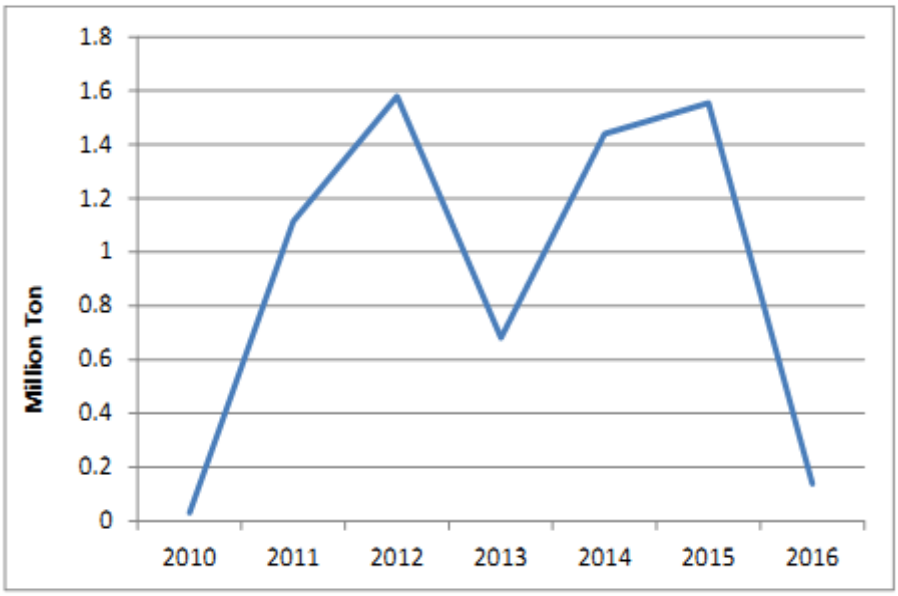

Figure 1 Indonesian Salt Production

The figure above shows that national salt production is fluctuating. This is one of the reasons is still very dependent on salt production activities with natural conditions such as weather and climate, so that domestic salt production tends to fluctuate. The condition is caused by the entire production of salt in Indonesia comes from evaporation of salt water in the salt table, so it depends on climate and weather. Therefore, the existence of anomaly climate phenomena in which weather and climate can not be predicted will greatly affect national salt production. The condition occurred in 2010, where the national production only reached about 30 600 tons.

The presence of domestic salt production fluctuations indicates that Indonesia has not been able to maintain its production level. Even according to Sucofindo (2012) states that of a total of about 240n million tons of salt produced by various countries in the world, Indonesia is only able to produce an average salt of 1.2 million tons per year. In other words, the proportion of Indonesia's salt production to total world salt production is less than 1 percent. This condition is in contrast to Thailand which only has a much shorter coastline than Indonesia is able to produce an average salt of 3 million tons per year. This is contradictory to the fact that Indonesia is one of the longest maritime countries in the world.

National salt production is generally used to meet domestic salt needs. In general, the need for domestic salt is differentiated into salt, ie salt for consumption (NaCl> 94.7 percent) and industry (NaCl content> 97 percent). Increased salt demand in Indonesia comes primarily from increased demand for industrial salt Chlor Alkali Plant (CAP). The proportion of industrial salt demand for CAP industry alone in 2011 reached 55 percent or amounted to 1 600 000 tons of salt from the total national demand. The industry needs salt with a very high purity level that has a content of NaCl greater than 97 percent. While domestic salt production is only able to produce salt with NaCL content 80-95 percent. In other words, domestic production is only able to meet the needs of salt consumption.

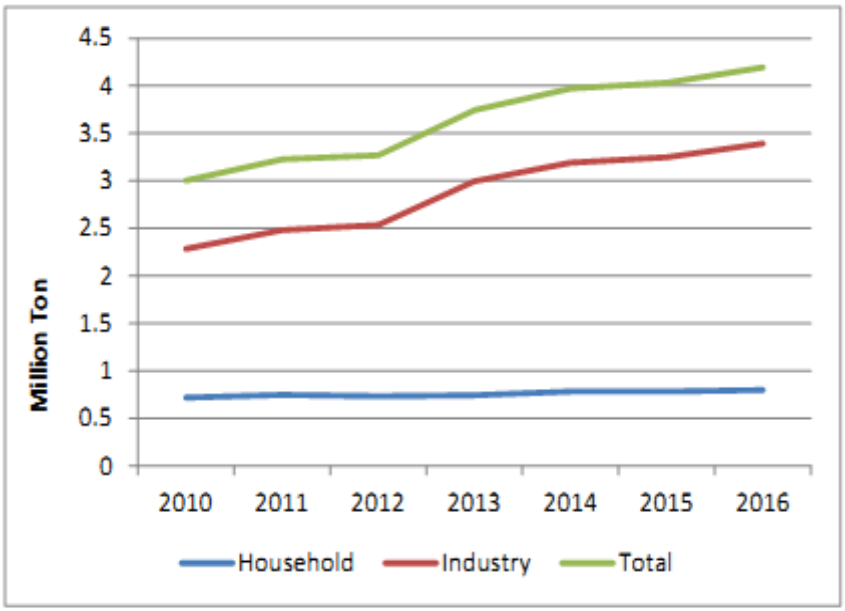

Figure 2 Development of National Salt Consumption

The imbalance between the needs of salt and the national salt production capacity prompted the government to import salt. Indonesia's salt production seems powerless in meeting national salt needs, especially for industrial salt, which almost 100 percent of its needs are met by imported salt. In addition, based on data from the Central Bureau of Statistics (BPS) during 2010-2016 the total volume of imported salt recorded fluctuations with an increasing trend. Figure 3 shows that in 2011 Indonesia's salt imports increased to 2.8 million tons. The large amount of Indonesian salt imports indicates that domestic salt production is

incapable of offsetting increasing domestic demand for salt.

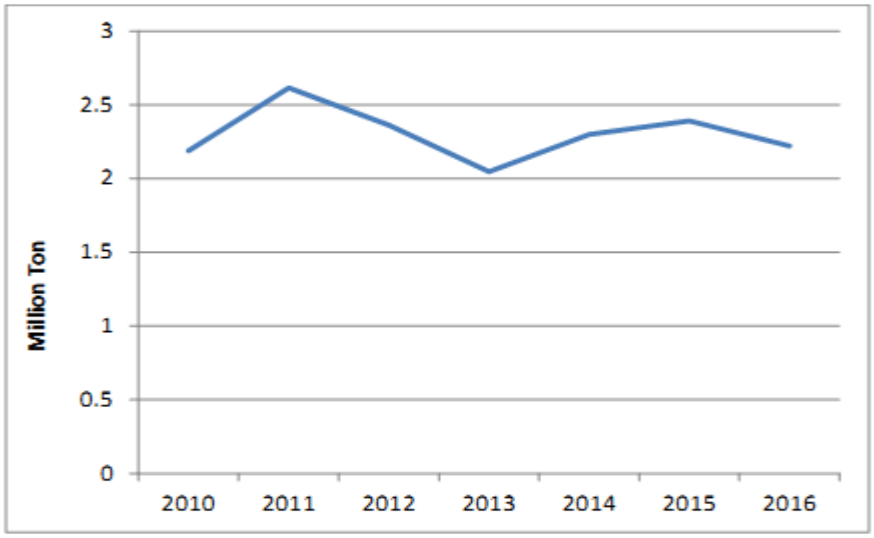

Figure 3 Imports of Indonesian Salt

According to the Minister of Marine Affairs and Fisheries, Indonesia's salt production averages 40 to 80 tons per hectare per year, while for the national industry salt demand per year is 2.6-2.8 million tons, which includes industrial needs for the chlor alkali plant industry (CAP) to 1.6 million tons which are all imported, food or cleaning industries can reach 500,000 tons, the drilling industry can reach 125,000 tons and other industrial needs 50,000 tons. If it is assumed that the current price of imported salt is Rp 1,000,000 per ton, then it is estimated that Rp.2.187,632 trillion of money should be spent by the state only to buy salt every year.

THEORETIC

The formal policy regulating the legalization of Indonesian salt imports was only issued in 2004. The legalization policy is reflected in the Decree of the Minister of Industry and Trade No.360 / MPP / Kep / 6/2004 which regulates various matters such as: (1) before the peoples' salt harvest until two months after the harvest season (SK Menperindag Np.422 / MPP / Kep / 5/2004: July 1st until 31 December). (2) A ban on import of salt if the price of quality of K1, K2 and K3 are respectively below the base price of rubbish at the collector point set by the government of each of them amounting to Rp. 145.000 / ton, Rp.100.000 / ton and

Rp.70.000 / ton in bulk form. (3) Companies wishing to import salt shall comply with the salt yield of at least 50 percent derived from public salt.

Decree of the Minister of Industry and Trade No. 455 / MPP / Kep / 2004 which excludes the import ban on salt if the import of salt is intended to fulfill domestic demand for salt industry. The existence of such policy creates a gap for unscrupulous salt importers to make a profit through deviations from the importation of salt. The deviation of the designation occurs due to the unclear tariff codes or HS between the consumption and industry salt in the Decree of the Minister of Trade of the Republic of Indonesia N0.58 / M-DAG / PER / 9/2012. The condition explicitly in article 1 states that the zip tariff / HS code for consumption salt with the lowest NaCl content is 94.7 percent ie 2501.00.90.10, while the zip code for industrial salt with the lowest NaCl content is 97 percent ie 2501.00.90.10. The similarity of the tariff post creates a gap for the importers to make a deviation even if only differentiated in terms of NaCl levels.

Government Policy on Empowerment and Business Development of Salt

In 2009 KKP through the National Program for Independent Empowerment of Marine and Fisheries Community (PNPM Mandiri-KP) implemented poverty reduction program mainly for marine and fishery communities. In 2011 the implementation of PNPM Mandiri KP will consist of Rural Business Development (PUMP) and People's Salt Business Empowerment (PUGAR). KKP is implementing PUGAR program as one of strategy to fulfill national salt requirement so that it can reduce the amount of salt import.

People's Salt Production

Salt is a simple chemical compound consisting of atomatoms that carry positive ions as well as negative ions, with the chemical formula NaCl; for every gram of salt nearly 40 percent consists of sodium (Na) and 60 percent more chlorine (Cl). Physically, salt is a crystal-shaped white solid that has a low toxicity that can not be burned, commonly added salt to food as a flavor enhancer (table salt). Salt is used as a raw material of chlorine and caustic soda for the manufacture of polyvinyl chloride (PVC), chlorine-based plastic, paper, in sub-tropical climates, salt is also used to remove ice sheets on the road (USGS, 2007).

Industrial salt industry in Indonesia is hereditary using sea water crystallization technology. The salt management of the Dutch colonial period (1700-1870) was leased to the Chinese by kings in Madura. Residents in the vicinity of salt fields only act as corvee labor (Rochwulaningsih, 2012). The nationalization of salt management was carried out in the period of independence (1945-1961) with the change of Regie Tjandu's office and salt from a Dutch-owned enterprise into the state property of the Republic of Indonesia.

According to Hernanto and Kwartatmono (2000) the determining factors of production in salt production are: (1) Sea water, (2) Land / land, (3) Climate (weather), (4) capital, (5) Technology and (6)) Labor. While Wirjodirjo (2003) developed a model of salt production with a dynamic approach where factors affecting salt business are: (1) land, (2) rainfall, and (3) net evaporation greatly affects production. Variable rainfall on the coast of Madura is very influential on salt productivity. Different rainfall in coastal areas greatly affects the productivity level of people's salt (Purbani, 2000). Meanwhile, according to Rachman (2011) several factors that affect the production of salt are: (1) salt pond area. Pond land is a determinant of the influence of production factors of people's salt products. Generally speaking, the more land (cultivated), the greater the amount of production produced by the land. (2) labor in this case salt farmers is an important factor in the process of salt production. (3) capital for production especially for preparation of pond farm management to become crystal table (4) technology, in improving quality of salt, covering land management technology, crystallization technology and other equipments such as wheel and pump. Post-production technology includes purification technology ie salt leaching to remove impurities contained in salt in the form of sand and mud and to reduce the levels of ions such as Ca, Mg, and SO4. As well as ions and other insoluble compounds.

METHOD

The method used to analyze factors affecting salt supply is quantitative method by using Ordinary Least Square (OLS) method with multiple linear regression model. The data processing is done by using STATA 12 software. The model used to analyze the factors that influence the supply of salt is multiple regression model

with single equation because this form is able to show how percent of dependent variable can be explained by independent variable with value R2 Besides this model can see whether the independent variables have real or no effect on the dependent variable by looking at the F-test and the t-test and the calculation is simpler.

RESULT

Table 1 multicollinearity test

Variabel	VIF	1/VIF
Curah Hujan	2.67	0.374
Teknologi	2.60	0.384
Dummy PUGAR	1.10	0.910
Rata2 VIF	2.12	

Based on the results of data analysis obtained value coefficient of determination (R2) on the model that is 0.6187. This value indicates that 61.87 percent of the variation of the dependent variable can be explained by the independent variables, while the remaining 38.13 percent is explained by other variables outside the model. From the estimation result, the value of Prob (F-Statistic) on the model has a 0.0115 value that is smaller than the real level of α of 5 percent so it can be concluded that there is at least one independent variable that significantly influence the salt supply in Indonesia with 95 percent confidence level. T-test conducted to see each independent variables have statistically significant effect on salt supply in Indonesia. The test can be done by looking at the t-statistic value of each variable smaller than the real level α = 5 percent. The independent variable rainfall and dummy PUGAR have a probability value smaller than the real level α = 5 percent.

Model Evaluation Stage Based on Economic Criteria

Estimation of the model obtained from the data processing showed good results because it has met the requirements of model testing. Furthermore, evaluation with economic criteria needs to be done by looking at the sign and the magnitude of each independent variable. Based on the estimated results obtained through the OLS method, two of the three variables used partially have significant effect on

salt supply in Indonesia. Table 2 presents the estimation results for each variable in the model.

Table 2 Factors Affecting Salt Supply in Indonesia

Variabel	Koefisien	St Error	P>ItI
Curah Hujan	-7.51	2.41	0.01
Dummy PUGAR	1.32	0.66	0.07
Teknologi	-0.81	0.07	0.27
Konstanta	74.20	19.20	0.003

The Effect of Rainfall on Salt Supply in Indonesia

he rainfall variable has a negative and significant effect on the real level ($\alpha = 0.05$) to the salt supply and has a coefficient of -7.51. This means that a 1 percent increase in rainfall will decrease salt supply in Indonesia by 7.51 percent when other variables are considered constant. Rainfall is very important in making salt. The results of this study are in accordance with the research hypothesis and with previous research conducted by Wirjodirjo (2003) developed a model of salt production with dynamic approach where factors affecting salt business are: (1) land, (2) rainfall, and (3) net evaporation greatly affects production. Variable rainfall on the coast of Madura is very influential on salt productivity. Different rainfall in coastal areas greatly affects the productivity level of people's salt (Purbani, 2000).

The Effect of Technology on Salt Supply in Indonesia

The technological variables have a negative but not significant effect on the real level ($\alpha = 0.1$) on the Indonesian salt supply and have a coefficient of 0.81. The technology used in producing salt does not change over time. The results of this study are not in accordance with the research hypothesis and with previous research conducted by Rachman (2011) several factors that affect the production of salt are: (1) salt pond land. Pond land is a determinant of the influence of production factors of people's salt products. Generally speaking, the more land (the cultivated / itanami), the greater the amount of production produced by the land. (2) labor in this case salt farmers is an important factor in the process of salt production. (3) capital for production especially for preparation of pond farm management to become crystal table (4) technology, in improving quality of salt,

covering land management technology, crystallization technology and other equipments such as wheel and pump. Post-production technology includes purification technology ie salt leaching to remove impurities contained in salt in the form of sand and mud and to reduce the levels of ions such as Ca, Mg, and SO4.

The influence of PUGAR on salt offerings in Indonesia

PUGAR variable has positive and significant effect on the real level ($\alpha = 0.05$) to salt supply. This means that PUGAR policy can increase salt production / supply in Indonesia especially in community ponds.

CONCLUSION

Factors that have significant effect on salt supply in Indonesia are rainfall and PUGAR but technology has negative effect. Negative rainfall coefficient can be explained that when there is an increase in rainfall rainfall will lead to supply of salt in Indonesia will go down. While the presence of PUGAR can increase the supply of salt.

BIBLIOGRAPHY

Alham F. 2013. Analisis Pemasaran Garam di Kabupaten Sumenep Jawa Timur. [Thesis]. Bogor: Departemen Agribisnis, Institut Pertanian Bogor.

Aligori A. 2013. Efisiensi Produksi Usaha Garam Rakyat di Kabupaten Indramayu. [Thesis] Bogor: Departemen Agribisnis, Institut Pertanian Bogor.

Arsyad L. 1999. Ekonomi Mikro Ikhtisar Teori dan Soal Jawab Edisi 2. Yogyakarta (ID): BPFE. Universitas Gadjah Mada Yogyakarta.

Hernanto, B. H, Kwartatmono, D.N. 2000. Teknologi Pembuatan dan Kendala Produksi Garam di Indonesia. Forum Pasar Garam Indonesia.

Ihsannudin. 2012. Pemberdayaan Petani Penggarap Garam Melalui Kebijakan Berbasis Pertanahan. Activita, Jurnal Pemberdayaan Mahasiswa dan Masyarakat UNS. Vol 2.

Jamil AS. 2014. Analisis Sistem Tataniaga Garam Rakyat (Studi Kasus: Desa Lembung, Kecamatan Galis, Pamekasan Jawa Timur). [skripsi]. Bogor: IPB

Koutsoyannis, A. 1977. Theory of Econometrics: An Introductory Exposition of Econometric Methods Second Edition. Ontario (CA): The Macmillan Pres Ltd and Row Publisher Inc.

Lipsey RG, Steiner PO, Purvis DD. 1987. Economics Eight Edition. New York (US): Harper and Row Publishers Inc.

Nicholson W. 2005. Teori Ekonomi Mikro I. Terjemahan. Jakarta (ID): Rajawali.

Pindyck RS, Rubinfeld DL. 1998. Econometric Model & Economic Forecasts Fourth Edition. New York (US): Mc Graw-Hill Inc.

Purbani, D. 2000. Proses Pembentukan Kristalisasi Garam. Pusat Pusat Riset Wilayah Laut dan Sumberdaya Nonhayati Badan Riset Kelautan dan Perikanan Departemen Kelautan dan Perikanan.

Rachman, A. 2011. Evaluasi Kinerja Usaha Petani Garam Rakyat Studi Kasus Di Kabupaten Bima, Nusa Tenggara Barat. Thesis IPB

Rochwulaningsih Y. 2013. Tata Niaga Garam Rakyat dalam Kajian Struktural. Jurnal Sejarah Citra Lekha. 17(1): 59-66.

Rochwulaningsih, Y. 2012. Pendekatan Sosiologi Sejarah Pada Komoditas Garam Rakyat : dari Ekspor Menjadi Impor. Paramita Vol. 22 No. 1 - Januari 2012. 14—24

Sucofindo. 2010. Pemetaan Potensi Lahan Pegaraman dan Kebutuhan Garam Nasional. PT Sucofindo: Jakarta.