PalArch's Journal of Archaeology of Egypt / Egyptology

Development of Madura Salt Industrialization amid the Covid-19 Pandemic

[1]*Prasetyo Nugroho*, [2]*Aprilina Susandini*, [3]*Darul Islam*

[1,2,3] Department of Management, Faculty of Economics and Business, University of Trunojoyo Madura
E-mail: [2]aprilina.susandini@trunojoyo.ac.id

Prasetyo Nugroho, Aprilina Susandini, Darul Islam: Development of Madura Salt Industrialization amid the Covid-19 Pandemic -- Palarch's Journal Of Archaeology Of Egypt/Egyptology 17(9). ISSN 1567-214x

Keywords: Madura salt, industrialization, business development, covid-19 pandemic

ABSTRACT

In the last few months, the world's economy has been disrupted heavily due to a pandemic known as Covid-19. Salt industry in Indonesia was no exception to this disruption, causing a dramatic decrease in salt demand from industrial sector due to massive and nationwide business interruptions. This research analyzed this problem with a qualitative approach to describe the effects of the ongoing Covid-19 pandemic thoroughly to salt industry in Madura, East Java region of Indonesia. Snowball sampling method was used due to the existence of key information. The Covid-19 pandemic had adverse impacts on the salt industry in Madura, including a decrease in the price of salt. The large-scale social restrictions (LSSR) in each area impeded the flow of salt marketing distribution.

1. Introduction

Covid-19, also known as the novel coronavirus, is shaking the global economy and Indonesia is no exception. This outbreak was firstly identified in the Chinese city of Wuhan in December 2019. The virus spread to other countries from January 2020. The Indonesian government announced the presence of a Covid-19 case on March 2020. The impacts of the Covid-19 outbreak on the global economy are predicted to be worse than those of the 2008 economic crisis and potentially destroy the economy. This pandemic caused social and economic disruption and cancellation or postponement of sporting, political, religious and cultural events. The Indonesian government instructed working from home, worshipping at home and learning from home. These were done to prevent the spread of the corona virus.

The spread of the corona virus slow down economic growth both nationally and globally. It eventually also affects various industrial sectors in Indonesia, from manufacturing to finance. According to Rhenald Kasali (News One, Thursday 26 March 2020), there are seven major shocks faced by business players, namely travel and entertainment shock, retail and manufacture shock, supply chain shock, personal debt shock, the currency shock, market shock and believe shock.

Economic conditions increasingly deteriorated with the enforcement of large-scale social restrictions (LSSR). LSSR aimed at preventing the spread of Covid-19 ultimately had an impact on economic activities and even slowed down the circulation of money. Many companies had to halt production temporarily due to social distancing that applied to all the areas in Indonesia. This indirectly slowed down the delivery of raw materials from suppliers and production goods were piled up in warehouses due to the restrictions. As a result, companies terminated and laid off some of their employees to reduce production costs. Almost all industrial sectors are affected by the spread of Covid-19, such as the automotive, steel, aircraft, railroad and shipbuilding, cement, ceramic, glass, regulator, electrical and cable equipment, electronics and telecommunications equipment, textile, machinery and heavy equipment as well as furniture and handicraft industries.

Most of the industrial sectors use salt as a mixing ingredient or auxiliary material in the production process. In a way, Covid-19 would disrupt the national salt demand since many companies temporarily stopped or reduced their production activities. According to Ali Mustadi, the chairman of Koperasi Produksi Garam Santing Sari Mandiri, salt in Indramayu is piled up in warehouses since no one wanted to buy it. The price of salt continues to plummet due to the corona virus outbreak. Salt production in the 2019 dry season was especially abundant and many salt farmers and business players stored salt in warehouses in the hope of getting a higher price when it would be sold in the rainy season. In fact, the abundant salt harvests during the 2019 dry season were not optimally sold. However, this was contrary to government policy of increasing the salt import quota from 2.75 million tons in 2019 to 2.9 tons in 2020. Hence, with the condition of abundant resources, the government have to take proactive steps, the government can act actively in terms of management and utilization, because this is one of the advantages of Indonesia and Indonesia must be able to maximize their resources (Wildan, 2021).

The price of salt dropped to IDR 350 per kilogram. Usually, it would increase in the rainy season. There were two factors that caused it to drop amid the Covid-19 pandemic. First, the government policy on social distancing to slow down the spread of the virus led the salt-purchasing companies to stop producing. Second, the government had a policy on increasing the allocation of salt import quotas.

In this regard, it is interesting to conduct a further study in Madura, given that Madura is the largest contributor to salt production in East Java. Madura had a total production of 768,136.22 tons or 75.93% of the total production in East

Java or 26.35% of the total national salt production with a land use of 6,240.39 Ha (Ministry of Maritime Affairs & Fisheries, 2015).

Based on the above background, the present study addresses the impact of Covid-19 on the salt industry in Madura, especially on salt business players and farmers. Furthermore, it draws up the concept of developing the Madura salt industrialization in the midst of the Covid-19 pandemic.

The results of the present study are expected to demonstrate the impacts of the Covid-19 pandemic on the Madura salt industry as a whole, starting from the demand, price and production of salt, to the impacts on salt farmers and business players. Furthermore, results of the present study would be used to serve as the basis for drawing up the concept of developing the salt industrialization in Madura in the midst of the Covid-19 pandemic which would not end in a short time.

2. Madura Salt Industry

Salt is among the marine products with great benefits for meeting the needs of human life. It is also an industrial raw material and foodstuff needed by almost all walks of life. Salt is mostly produced traditionally by smallholder farmers, as well as industrial salt companies. In terms of production quality, domestic salt has not met the health requirements, especially the salt produced by salt farmers. It is because the quality of salt is generally below the quality II according to the SNI/SII No.140-76 specifications. Salt is a white crystalline solid, which is a group of compounds consisting dominantly of sodium chloride (> 80%) and other compounds, such as magnesium chloride, magnesium sulfate, and calcium chloride. In addition to being an industrial product, salt is also used as an auxiliary material in various industries. So far, the use of salt has been concentrated in three areas: as foodstuffs, industrial (as a raw or auxiliary material), and preservatives.

Salt components have an important role in the human body. For example, NaCl serves to maintain blood volume and pressure regulation, maintain muscle contraction and nerve cell transmission, and help balance water, acids and alkalis in the body. In addition, salt can effectively and efficiently overcome the problem of iodine deficiency. Excess salt consumption can lead to high blood pressure in the body. Different populations have different salt consumption per day and each country has variations in salt consumption. The average Japanese person consumes 6.9 grams of salt per day, while Americans only 3.5 to 3.9 grams per day. The highest salt consumption is in Indonesia with 9.4 grams per person per day (Hartoyo 2011).

In general, salt in Indonesia remains to be produced traditionally using a simple method. It is produced using a total crystallization system to produce low quality salt with a productivity of 35-45 tons per hectare per year.

Being one of the important commodities in Madura, salt has long been traded. From the Madura local government to the reign of the Veerenigde Oost Indische Compagnie (VOC), salt in Madura was produced under a rental system. However, salt production was initially seen as an unprofitable activity. Therefore, the monopoly of salt production was given by the local government

to Chinese people. On the other hand, there were also many indigenous people who used their salt fields for other purposes due to the cheap price of salt.
In the early 20th century, Madura was a center for a monopoly-based salt production. This policy at the same time authorized the takeover of salt production from the control of the Chinese people. This regulation made the Dutch Colonial Government the main producer of salt in the Dutch East Indies (Kuntowijoyo, 2002). There are at least three important areas of salt industry in Madura: Sampang, Pamekasan, and Sumenep. The three areas are all located in the southern region of the island of Madura.

3. Methods

The present study used the qualitative approach since it describes the actual field conditions in a detailed and in-depth manner. This study was conducted in salt- producing areas in Madura: Sampang, Pamekasan, and Sumenep regencies.
The population was salt business players and farmers. Samples were taken by using the snowball sampling technique. Data were collected by using the field observation, interview, documentation and triangulation techniques. Triangulation was used to test data credibility. The present study was conducted by adhering to the health protocol during the new normal. Data were analyzed before, during and after on the field.

4. Results

The present study was performed in the salt-producing areas spread over three districts: (1) Sampang Regency is Indonesia's second largest salt center with an average annual salt production of 399 thousand tons. Sampang has the largest area of salt fields in Madura, with the salt center located in Pangarengan Sub-district. (2) Sumenep Regency is known as the fifth largest salt contributor in Indonesia, with an average annual salt production of 236 thousand tons. For Sumenep Regency, the present study was conducted in Desa Pinggir Papas and Karang Ayar of Kalianget Sub-district. (3) Pamekasan Regency is also a salt producing area and among the top ten salt centers in Indonesia. The largest salt areas are in Galis and Pademawu Sub-districts.
The respondents of the study were 90 salt farmers, nine traders, three salt-processing businesses and four salt farmer cooperatives. Distribution of respondents are shown in Table 1.1 below.

Table 1.1 Distribution of respondents by districts

No.	District	Respondents	Number
1	Pamekasan	Salt farmers	30
		Traders	3
		Cooperative	1
		Salt-processing businesses	1
2	Pamekasan	Salt farmers	30
		Traders	3
		Cooperative	2
		Salt-processing businesses	1
3	Sumenep	Salt farmers	30

		Traders	3
		Cooperative	1
		Salt-processing businesses	1
Total			**106**

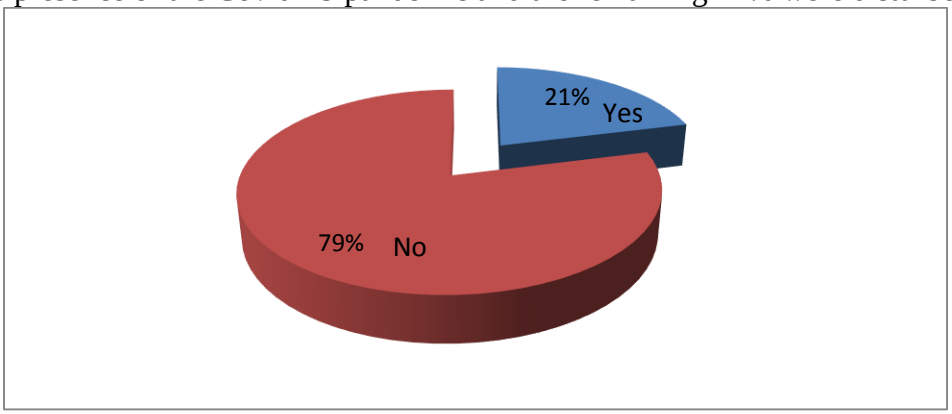
Source: Data processed, 2020.

The Covid-19 pandemic suppressed Indonesia's economic growth in the second quarter of 2020. Economic growth in the second quarter of 2020 contracted by 5.32 %, a decrease relative to that of the first quarter of 2020 of 2.97%. This development was inseparable from the impact of the weakening global economy in line with the Covid-19 pandemic and declining domestic economic activities as a result of the Large-Scale Social Restrictions (LSSR) policy to prevent the spread of the Covid-19 pandemic.

Almost all industrial sectors are affected by the spread of Covid-19 pandemic and most of it use salt as a mixing ingredient or auxiliary material in the production process. In a way, the presence of Covid-19 would disrupt the national salt demand since many companies temporarily stopped or reduced their production activities. The results of the present study would demonstrate the condition of salt farmers, business players and cooperatives during the Covid-19 pandemic.

1) Conditions of Salt Farmers during the Covid-19 Pandemic

Results of the present study show that most salt farmers stated that their activities as salt farmers were not disturbed by the presence of Covid-19 pandemic in Indonesia. Figure 1.1 shows that seventy-nine percent (79%) of salt farmers perceived that their salt-producing activities were not disturbed by the presence of the Covid-19 pandemic and the remaining 21% were disturbed.



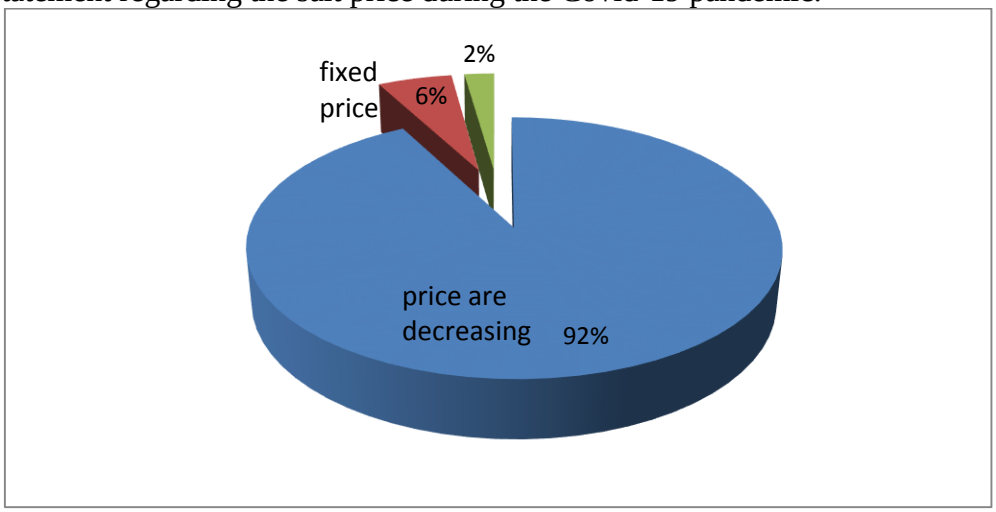
Source: Data processed, 2020.

Figure 1.1 Salt Farmers' Activities during Covid 19

Salt farmers only performed their activities on their salt ponds not far from their residence; thus, the Covid-19 pandemic did not interfere with their work. They remained active as usual, some starting to improve their salt fields and some starting to produce salt.

The spread of Covid1-9 did not affect salt farmers' activities, but the price of salt currently decreased. They hoped that the 2019 salt harvests could be sold at

a higher price but, instead, it decreased. Figure 1.2 shows salt farmers' statement regarding the salt price during the Covid-19 pandemic.



Source: Data processed, 2020.

Figure 1.2 Price of Salt during Covid 19

Ninety-two percent (92%) of salt farmers said that the price of salt plummeted during the Covid-19 pandemic. Six percent (6%) of them said that the price of salt was stable and two percent (2%) said that it could not be determined. During the rainy season (beginning of the year), salt prices would usually be higher than that during the dry season. Usually, farmers would store some of the salt from their previous harvests and sold it during the rainy season in the hope that the salt price would be higher. Prior to the Covid-19 pandemic, the price was low and currently it increasingly went down.

Some salt farmers said that the salt price was stable since they thought that there was no change in price which should be higher than that in the dry season. In addition, they could not predict the current price of salt.

The price of salt in August 2020 was IDR 300/kg or IDR 300,000 per ton and at the beginning of October 2020 it dropped to IDR 250/kg or IDR 250,000 per ton or IDR 15,000 per sack.

2) Performance of Business Players and Cooperatives during the Covid-19 Pandemic

The present study involved 16 business players, consisting of salt traders, salt-processing businesses, and salt cooperatives. Salt traders consisted of wholesalers and small traders, and some were in the form of UD (trading business). The main activity of traders is to buy salt from farmers and sell it to factories or to larger traders and small traders sell salt to the local markets. Small traders do not have the access to sell their salt to factories. Usually, they would borrow the name of the wholesaler to send their salt to factories. On average, salt traders have been running their business for 12 years and some have been in the business for 20 years and some for 6 years. Usually, traders have 50 freelance workers or transport workers, on average.

Results of the present study show that the Covid-19 pandemic inhibited the traders' activities. They could still buy salt from farmers, but the sale or delivery of salt to factories was disrupted due to the many steps that should be passed. LSSR enforced in each region resulted in an additional cost for traders when delivering salt to factories outside the island of Madura since they had to undergo a rapid test. Most of the traders complained that business activities were not smooth and the factory demand for salt decreased. The demand for salt decreased since some factories closed. During the Covid-19 pandemic the delivery of salt to the factory was limited to only three trucks per day and sometimes there were no deliveries. In normal conditions before the pandemic, traders used to deliver 20-25 tons of salt per day to factories with an average monthly total of 400 tons. During the pandemic, daily delivery was limited to an average of less than 20 tons per delivery. The declining demand had an impact on business conditions. In addition, factory payments from were in arrears and the farmers' loan-derived capital has not been repaid since their salt has not been sold. The problems faced by traders were increasingly complex when Covid-19 spread, leading to a decreasing price of salt in the market. According to the traders, the previously low price of salt increasingly plummeted with the presence of the Covid-19 pandemic.

The present study also involved 3 salt-processing businesses whose main activity is to process raw salt (locally known as "krosok" salt) into consumption salt and animal feed salt. Some of the businesses have been running for 19 years and some for about 1.5 years. Their main activity was to buy salt from farmers and then process it into iodized and non-iodized salt. The list of salt-processing businesses is shown in Table 1.2 below.

Table 1.2 List of Salt-Processing Businesses

No	Name	Length in the Business	Location	Activities
1.	CV Media	19 yrs	Pangarengan Sub-district of Sampang Regency	Engaged in the production of iodized fine salt
2.	Lembaga Usaha Pangan Masyarakat 'POKTAN SRI WEDARI'	1.5 yrs	Dusun Kretek, Desa Pademawu Barat, Pademawu Sub-district of Pamekasan Regency	Engaged in the production of fine (iodine and non-iodine) salt. The iodine salt would later be converted into table salt while the non-iodine salt would be sold to animal feed factories.
3.	UD. Arul Mulia	10 yrs	Desa Karang Anyar, Kalianget Sub-district of	Engaged in the production of non-iodine fine salt

			Sumenep Regency	sold to animal feed factories

Source: Data processed, 2020.

The traditional processing of 'krosok' salt into iodized and non-iodized salt is as follows:

a. 'Krosok' salt is put into a perforated basket. The basket is placed on the water drum. Then, clean water is poured into the salt until the water drum is full. Upon melting, the impurities in the salt water is separated.
b. Cleaned salt is filtered for a maximum of 12 hours. Filtered salt water can be transferred to another empty drum. Upon settlement of the impurities, the resulting water can be put into a burning plot. The burning process is performed for 2 hours in order to obtain fine salt.
c. The salt is put into a spinner to separate the salt from the remaining water in the salt.
d. An iodization process is performed for iodized salt but it is not performed for non-iodized salt; rather, a cooling process is first performed prior to the packing. After iodization, the salt can be packed. Salt is packed manually. Iodized salt is packed in small packages and is sold at a factory price of IDR 1,000 per package. Meanwhile, non-iodine salt is sold at IDR 1,500,000 per ton.

The 'krosok' salt processing into fine salt would be faster when using a machine or modern method since the purchased 'krosok' salt is directly put into a grinding machine, but it should be determined whether the salt is geomembrane-grounded salt or ground salt. Ground salt has to go through a washing mechanism in order to clean the salt from impurities; however, geomembrane-grounded salt is directly put into a grinding machine without having to go through the washing mechanism. Geomembrane-grounded salt is clearly clean and clear since sea water does not directly touch the ground. After the grinding process, iodized salt is immediately packed and non-iodized salt goes through the iodization process.

The field observation showed that the 'krosok' salt processing into fine salt remained continuing as usual during the pandemic. The business players admitted that the price of 'krosok' salt was getting lower since the presence of the Covid-19 pandemic. From the business players' point of view, the decline in the price of krosok salt would be profitable since the raw material costs were getting smaller. In addition, the lower salt price in the market did not affect the price of salt products produced by the business players since the price of fine salt was determined by the factory. However, the business players complained that the spread of Covid- 19 greatly disrupted the flow of product distribution. Delivery of goods was not smooth or disrupted due to the social distancing policy. The demand for salt decreased and even at the middle of March to the end of July there was almost no demand for salt at all. Production costs remained incurring since business activities kept running but the products were piled up in warehouses and this would increase storage costs. The iodized salt products were marketed in the Madura area, while the non-iodized salt for animal feed was marketed in Malang and Sidoarjo areas.

A cooperative is a joint business entity established by shared business interests and socio-culture. Salt cooperatives have been established in several salt-producing regions, and specifically deal with salt. Table 1.3 describes those cooperatives in Sampang, Pamekasan, and Sumenep Regencies.

The Covid-19 pandemic did not only affect salt farmers and business players, but also salt cooperatives, which also experienced a decline in activity. Koperasi Maju Bersama, which is engaged in savings and loans, told that its financial condition was not good. Many cooperative members could not afford to pay installments and withdrew savings to make ends meet. This was due to the decreased salt price during the pandemic, leading to the farmers' difficulty paying their loans.

Table 1.3 Description of Salt Cooperatives

No	Name of Cooperative	Location	Number of members	Activities
1.	Koperasi Maju Bersama	Kec. Pangarengan, Kab. Sampang	5 employees and 40 members	Engaged in savings and loans.
2.	KUD Karya Sakti	Kec. Larangan, Kab. Pamekasan	60 members, 3 employees, 3 supervisors and 3 managers	Engaged in salt storage and treatment. Farmers who have harvested the salt can deposit their salt in this cooperative with a storage fee of IDR per kg.
	Koperasi Madusegoro	Kec. Pademawu, Kab. Pamekasan	62 members, 32 of them from 'Sumber Barokah' Forest Village Community Organization (LMDH)	Engaged in food and beverage shops as well as daily necessities. In addition, this cooperative sells the salt sacks that farmers need.
	Koperasi Sumber Hasil	Kec. Kalianget, Kab. Sumenep	4 employees and 700 members	Engaged in savings and loans, buying and selling salt. In addition, this cooperative also processed 'krosok' salt into consumption salt which has obtained BPOM certification under the brands 'Bunda', 'Reformasi', and 'Nusantara'

Source: Data processed, 2020.

The spread of Covid-19 disrupted the activities of salt cooperatives, leading to a decrease in and even no demand for salt from factories. Usually, salt was delivered almost every day, but during the Covid-19 pandemic the delivery was disrupted and even there was no operation. It was not only delivery activity that decreased, but also the salt price.

The establishment of cooperatives was expected to help salt farmers accommodate the members' salt production. Cooperatives also help the production process by providing operational costs according to the members' ability (savings and loans). According to Erlina and Kurniawa (2015), one of the problems of cooperatives is that they have not been able to maintain the stability of the selling price of products that provide decent benefits. The Covid-19 pandemic led salt cooperatives to experience financial difficulties. This affected the granting of business capital to salt farmers to start salt production in the dry season.

3) Conditions of the Salt Industry in Indonesia during the Covid-19 Pandemic

According to the Ministry of Industry, the manufacturing industry only absorbed around 980,000 tons of local salt until early July 2020. It was lower than the contract of 1.1 million tons. This was possibly because many salt-consuming industries reduced their production activities due to government policies to reduce the spread of Covid-19. The large-scale social restrictions (LSSR) policy impeded the flow of goods, leading to some industries' difficulty continuing production. This condition was exacerbated by the decline in the price of salt in the market. Salt traders and farmers admitted that the price of salt was indeed low because imports exceeded demand, but Covid-19 pandemic exacerbated the drop in salt prices. The pandemic also affected the performance of Indonesia's salt economy.

In the salt market chain, salt farmers depend on the demand for salt in the industrial sector, as well as the price of salt. With the spread of Covid-19 in Indonesia many industrial sectors reduced production and some even stopped their activities. This had an impact on the demand for salt in the market and led to a decrease in the price of salt. Figure 1.3 shows the parties involved in the salt market chain in Madura and Figure 1.4 shows the business process of salt industry in Indonesia.

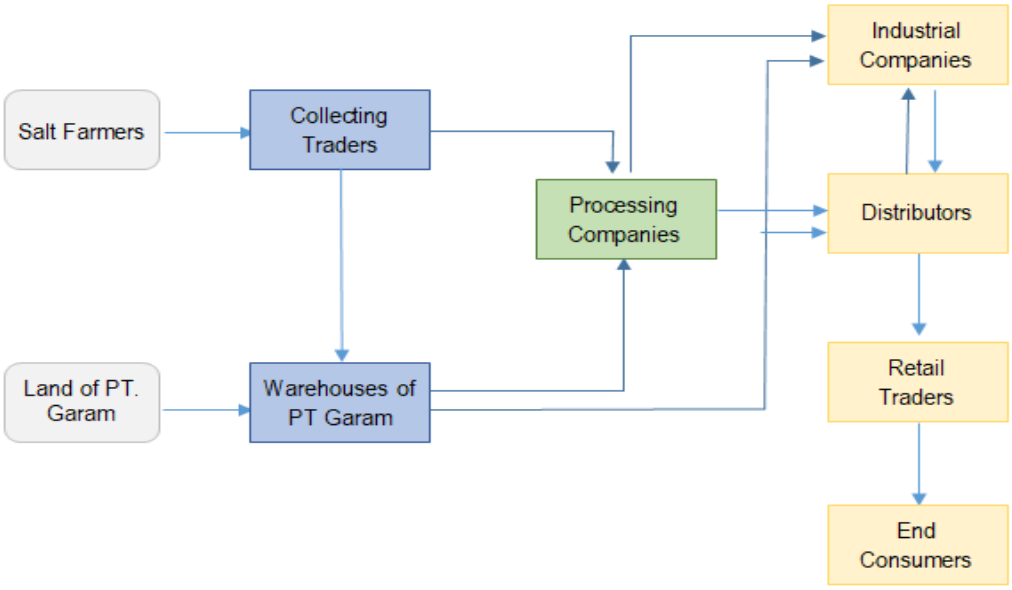
4) Concept of Madura Salt Industrialization Development amid the Covid-19 Pandemic

Based on Decree of the Minister of Industry No. 88/M-IND/PER/10/2014, salt is a product of the chlor-alkali basic chemical industry group which consists of consumption salt and industrial salt. Salt grouping is shown in Figure 1.5 below.

Consumption salt is one that is used for public consumption or processed into household salt and dietary salt.

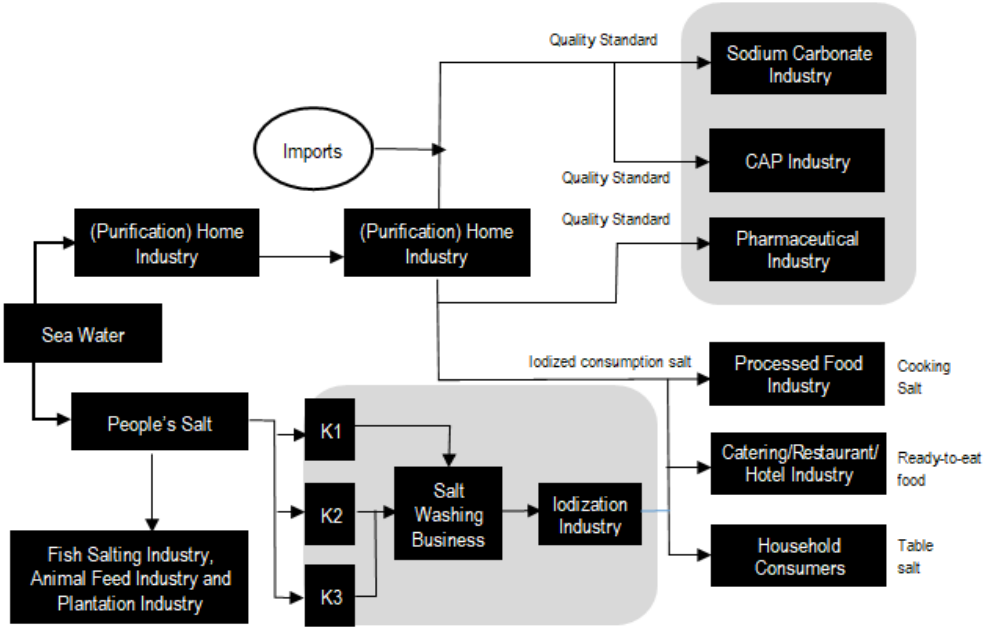
a) Household salt is iodized consumption salt with a minimum NaCl content of 94% on a dry basis with a maximum water content of 7%, a maximum water insoluble portion of 0.5 mg/kg on a dry basis, Cadmium (Cd) of a maximum of 0.5 mg/kg, lead (Pb) of a maximum of 10.0 mg/kg, Mercury (Hg) of a maximum of 0.1 mg/kg and Arsenic (As) contamination of a maximum of 0.1 mg/kg and potassium iodate (KIO_3) of a minimum of 30 mg/kg in solid form which is consumable directly by people.

b) Dietary salt is iodized salt in a liquid/solid form with a maximum NaCl content of 60% on a dry basis and 30 mg/kg of potassium iodate (KIO_3) which is consumable directly by people.



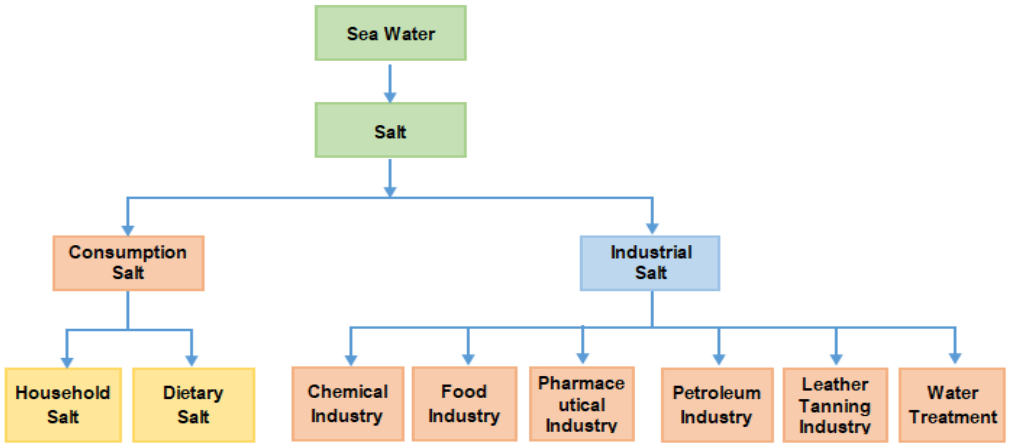
Source: Results of the study Nugroho et al, 2019.

Figure 1.3 Salt Market Chain in Madura



Source: Marine and Fisheries Ministry, The Republic of Indonesia, 2015.

Figure 1.4 Salt Business Process in Indonesia



Decree of the Minister of Industry No. 88/M-IND/PER/10/2014

Figure 1.5 Salt Grouping

Under the regulation of the Minister of Industry No. 88 of 2014, industrial salt is salt used as raw material/auxiliary material used in the production process in the chemical industry, food industries, pharmaceutical industry, petroleum industry, leather tanning industry and water treatment. The industrial salt has different technical specifications depending on the type of industry.

a) Chemical Industry Salt is a type of salt that is used to produce chemical compounds, including Chlor-Alkaline Plant (CAP). CAP products are used for the paper industry, PVC industry, soap (detergent) and textiles.
b) Miscellaneous food industrial salt is iodized or non-iodized salt which is used as raw material/auxiliary material in miscellaneous food industries to produce food or beverages. The technical specifications required for miscellaneous food industry salts are iodized and non-iodized salt with food-grade standards and have been processed with a certain degree of refinement with predetermined levels. This type of salt is widely used in the noodle industry, cooking spices, biscuits, sugar drinks, soy sauce, butter and fish canning.
c) Pharmaceutical industry salt is a type of salt used in the pharmaceutical industry as raw material/auxiliary material with a minimum NaCl content specification of 99.8% on a dry basis, with impurities levels close to 0%. This type of salt is widely used for the manufacture of intravenous fluids, blood purifying fluids (hemodialysis) or pure salt.
d) Petroleum industry salt is salt used as an auxiliary material in the oil drilling process.
e) Industrial tanning salt is salt used as an auxiliary material in the leather tanning process. The salt specification for the industry is salt which is designated as an auxiliary material with a minimum NaCl standard of 85% on a dry basis.
f) Salt water treatment is a salt used as an auxiliary material in the water purification process and/or softening the water in the boiler. The required

specification for salt for water treatment is a minimum of 85% NaCl which is used as an auxiliary material for water purification.

Salt industrialization experiences a change from traditional to modern salt processing which has an added value. Industrialization of salt processing requires a significant change from the modernization of production which is an activity to transform products from farmers to final consumer destinations (which include production and processing activities) as well as modernization of distribution and coordination in the salt market chain.

In the agricultural industry, it is quite important to identify value-added activities that would support the required investment through research in marketing and processing, design and restructuring of the distribution system. Advances in technology would provide information to produce salt as consumer desires.

Small-scale business development models can be implemented through cooperation among farmers or farmers with other business players, such as contract growing, leasing arrangements, joint ventures or through cooperatives.

Based on the above description, industrialization of salt processing can be undertaken from upstream to downstream, namely from the production to the marketing of salt. In terms of production, salt farmers, especially in Madura, remained using traditional methods of producing salt. They produced salt by relying solely on sunlight (heat), wind and water. Salt farmers in Madura have not had adequate equipment for salt production. Salt production remained depending on nature, such as the wind which serves to move windmills to transfer water. Most salt farmers have been using geomembranes in the production process so as to improve the quality of the salt. The technology used in the production of people's salt remained very traditional, affecting the productivity of farmers' salt production.

The national salt production was only able to meet the consumption needs, while for industrial purposes it remained depending on imports. The marketing of people's salt was limited to consumption.

The government needs to improve the quality and quantity of domestic salt both through intensification, such as improving technology, developing human resources by improving institutions and through building infrastructure around salt ponds. Several government programs to improve the quality and quantity of people's salt include the community salt business development program (PUGAR) and the salt economy center program (SEGAR). The People's Salt Economy Center is a program that manages salt in stages starting from the village level by applying integrated land and people's salt warehouses. Subsequently, at the district level, secondary cooperative institutions are strengthened and a national salt warehouse and its network with village-based people's salt warehouses is constructed. The People's Salt Economic Center program is expected to absorb the people's total salt production maximally as a raw material for consumption and industry, leading to an increase in the income of the salt farmers. A profit sharing scheme is recommended for both regencies and provinces with regard to salt business.

In the midst of the Covid-19 pandemic, there needs to be innovation and creative ideas so that salt can be absorbed by the market. There needs to be awareness from farmers or village communities to develop the potential of the village so as to be able to add value to salt. The most appropriate concept of developing Madura salt industrialization in the midst of the pandemic is to process 'krosok' salt into salt products. Therefore, it is necessary to have an entrepreneurial spirit or community entrepreneurship, with the hope that people's salt does not depend on factory demand. Figure 1.6 shows the concept of the development of Madura salt industrialization based on the results of the present study.

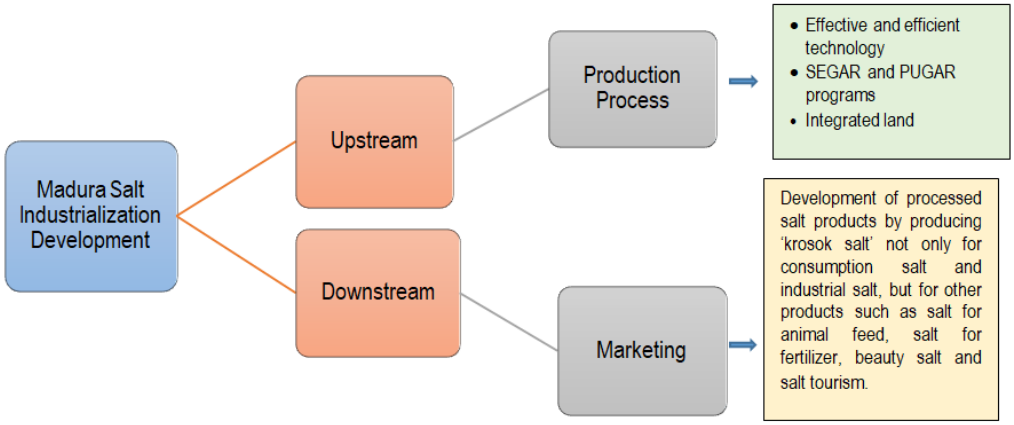


Figure 1.6 Salt Industrialization Development Concept Amid the Covid-19 Pandemic

The figure above shows that Madura salt industrialization in the midst of the Covid-19 pandemic needs to be developed with regard to the sub-optimal salt absorption. Therefore, it is necessary to develop human resources (HR) to increase entrepreneurship awareness of farmers and the surrounding communities. There should be a change in the mindset of farmers and communities that salt can have more value when it is further processed, such as spa salt, non-iodine fine salt for animal feed, salt for fertilizer mixtures and various health-oriented processed salts, such as low sodium salt for diet, mouthwash for reducing mouth bacteria, salt to wash fruits and vegetables.
This can be realized with the government support, collaborating with salt associations/institutions and academics. Activities to realize the development of salt industrialization in Madura include conducting entrepreneurship training and development for local salt-producing communities.

5. Conclusions and Recommendations

The Covid-19 pandemic had adverse impacts on the salt industry in Madura, including a decrease in the price of salt. The large-scale social restrictions (LSSR) in each area impeded the flow of salt marketing distribution. The Covid-19 pandemic did not affect salt farmers' activities, but the price of salt was currently decreasing. The pandemic affected the business players and

cooperatives since it impeded their activities, especially in terms of the delivery of salt to other areas due to the LSSR.

Industrialization of salt processing can be undertaken from upstream to downstream, namely from production to marketing of salt. Madura salt industrialization in the midst of the Covid-19 pandemic needs to be developed with regard to the sub-optimal salt absorption. Therefore, it is necessary to develop human resources (HR) to increase entrepreneurship awareness of farmers and the surrounding communities by developing processed salt products. The 'krosok' salt should not only produced for consumption and industrial salt, but it can be processed into such other products as salt for animal feed and fertilizers.

Salt farmers need to establish collaboration among farmers or farmers with other business players, such as contract growing, leasing arrangements, joint ventures or through cooperatives. In addition, it is necessary to develop processed salt products.

To realize it, the Government needs to enhance the quality and quantity of domestic salt through intensification such as improved technology, human resource development with institutional improvement, and development of infrastructure around the salt ponds.

References

Burhanuddin. (2001). *Salt Industry Development Strategy in Indonesia*. Yogyakarta: Kanisius.

Desrosier, N.W. (1988). *Food Preservation Technology 3rd Ed*. Translator Muchji Mulyohardjo. Jakarta: Universitas Indonesia.

Ghani, Echsan, Boy Singgih Gitayuda. (2020). The Income of Salt Farmers in Madura: an Explanation of Profit-Sharing System. *Jurnal Media Trend* 15 (2), pp. 263-274.

Hartoyo. (2011). *Policy Direction Towards Self Sufficiency in Salt: Consumer aspects*. In editing: Roosita K, Krisnatuti D, Alfiasari, Purwandari H. *Conference proceedings: Salt Self-Sufficiency Strategy*, pp. 100-106. Bogor: Institut Pertanian Bogor.

Ihsannudin. (2012). Empowerment of Salt Cultivators through Land-Based Policies. *Jurnal Activita*, 2(1), pp. 13-22.

Kuntowijoyo. (2002). *Social Change in Agricultural Society: Madura 1850-1940*. Yogyakarta: Mata Bangsa.

Nugroho, Prasetyo et al. (2020). Assessing the Salt Marketing System in Madura. *Jurnal Media Trend*, 15(1), pp. 111-122

PT APROGAKOB. (2001). *The Position of Salting and Its Influence on the Salt Industry in Indonesia*. In editing: Baharudin S. *Proceedings of the Indonesian Salt Market Forum*. Jakarta: Marine and Fisheries Ministry of Republic Indonesia

Rachman A. (2011). Evaluation of the business performance of smallholder salt farmers (case study in Kabupaten Bima, West Nusa Tenggara). *IPB Repository*. Bogor: Graduate School, Institut Pertanian Bogor.

Rochwulaningsih Y. (2013). People's Salt Trading System in Structural Studies. *Jurnal Sejarah CITRA LEKHA*, XVII (1), pp. 59 - 66.

Wildan, MA., Imron, MA. (2021). Macroeconomic Factors Affecting Natural Gas Export Management. *International Journal of Energy Economics and Policy*, 11(1), pp. 639-644.

Zainuri, Achmad. 2012. *East Java Salt Potential Data Collection Report*. Malang: PPKE.

https://www.isw.co.id/post/2019/07/01/10-daerah-penghasil-garam-terbesar-di-indonesia. Access, 18 September 2020.

https://money.kompas.com/read/2020/05/10/091500226/perekonomian-indonesia-pasca-pandemi-covid-19?page=all. Access, 27 May 2020

http://pusriskel.litbang.kkp.go.id/index.php/en/litbang/air-laut-dan-garam/2015/791-analisis-sistem-produksi-garam-rakyat-dalam-mendukung-sistem-informasi-garam-rakyat-sitegar. Access, 06 October 2020.

https://kkp.go.id/djprl/jaskel/artikel/21936-membangun-sentra-ekonomi-garam-rakyat. Access 06 October 2020