

# INTELLIGENTE SALZFABRIK: SELF-INTEGRATED PHARMACEUTICAL RAW MATERIALS INDUSTRY IN INDONESIA

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## ABSTRACT

Currently, Indonesia's pharmaceutical industry is still heavily dependent on imported raw materials, almost 95% of the needed medicine raw materials (BBO) still have to be imported from abroad. Based on data from the Directorate General of Foreign Trade, Ministry of Trade Republic of Indonesia, it was showed that the pharmaceutical salt import in 2013 reached 3,152 tons and all of them needed to fulfill domestic needs. This study used literary study method by collecting data or information in accordance with the topic. Geographically Indonesia consists of islands large and small number of approximately 17,504 islands. Three quarters of its territory is the ocean (5.9 million km<sup>2</sup>), with a 95,161 km long coastline, the second longest in the world after Canada. This makes Indonesia the world's largest archipelago in the world. This written idea was created as a solution to the problem of dependence on medicine raw materials import in the pharmaceutical industry of Indonesia. The solutions presented are *Intelligente Salzfabrik*: The Concept of Self-Integrated Pharmaceutical Raw Materials Industry which is Energy Independence and High Accessibility on Coastal with Sea Toll and Power Flow to Achieve An Imported Medicine Raw Materials Independence in Indonesia. This development will be implemented in close proximity to coastal areas near the the sea so that it can simplify both cost and transportation required for the distribution of salt produced.

**Keywords:** Intelligente Salzfabrik, Pharmaceutical, Raw Materials

## INTRODUCTION

Currently, Indonesia's pharmaceutical industry is still heavily dependent on imported raw materials, almost 95% of the needed medicine raw materials (BBO) still have to be imported from abroad. One of the raw materials imported is pharmaceutical salt. In the pharmaceutical industry, pharmaceutical salt is a raw material that is widely used as raw material of infusion dosage form, tablet production, vaccine solvents, syrup, oralyte solution, dialysate solution, healthy drinks, etc. In cosmetic field, pharmaceutical salt is also used as one of the mixture in making soap and shampoo. Pharmaceutical salt supply in Indonesia is still dominated by imported products, including from Germany, China, Australia, New Zealand and India (Rusdi, 2016). This is because there is no domestic industry that can produces the salt until now.

Based on data from the Directorate General of Foreign Trade, Ministry of Trade Republic of Indonesia, it was showed that the pharmaceutical salt import in 2013 reached 3,152 tons and all of them needed to fulfill domestic needs. Based on the same source, it was mentioned that the increase of pharmaceutical salt import volume were 25% and 35% respectively in the range of 2011-2012 and 2012-2013. The results of economic analysis stated that the capacity of recommended pharmaceutical salt was at least 2,000 tons per year or about 2/3 of the total current pharmaceutical salt market and its capacity can be optimized to 3,000 tons per year (Kemenperin, 2015).

The government's efforts in dealing with this problem can be seen from the success of the Agency for the Assessment and Application of Technology (BPPT) which has developed the

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production technology of pharmaceutical salt up to the pilot scale. The product of the study has passed product testing as a pharmaceutical degree NaCl from various laboratories. However, this does not directly and effectively reduce the amount of imports of pharmaceutical salts in Indonesia over the next few years.

This written idea was created as a solution to the problem of dependence on medicine raw materials import in the pharmaceutical industry of Indonesia. The solutions presented are *Intelligente Salzfabrik*: The Concept of Self-Integrated Pharmaceutical Raw Materials Industry which is Energy Independence and High Accessibility on Coastal with Sea Toll and Power Flow to Achieve An Imported Medicine Raw Materials Independence in Indonesia. This development will be implemented in close proximity to coastal areas near the the sea so that it can simplify both cost and transportation required for the distribution of salt produced.

The concept applied to the area is the design of an independent pharmaceutical industrial plant in terms of energy by utilizing wave power around the sea, it is also expected to be a pilot plant that carries the concept of green-factory. Thus, the development of this industry will be able to suppress the rate of medicine raw materials import, especially pharmaceutical salts that are still imported from abroad so that the cost of production becomes more efficient. In addition, based on the mapping of technology content and sources of raw materials and auxiliary materials, the technology of pharmaceutical salt production applied is mostly using materials or equipment which is produced domestically. Therefore, the plan of pharmaceutical salt industry construction is indirectly able to provide an added value for other related industries.

## METHOD

This study used literary study method by collecting data or information in accordance with the topic. Literature study is a method of data collection by studying the scientific journal of the existing research that developed further in this study. The researchers identify, develop, and incorporate research evidence relevant past. This study used data that refers to the source of the scientific journal of the existing research. Furthermore, the collected data was selected to obtain relevant data to be discussed in this study. Subsequently, the data obtained was processed to be developed and added with innovations from previous data into this study. The latter process is a further exploration of the innovations of researchers and the design of the latest models.

## FINDING AND ARGUMENTS

Geographically Indonesia consists of islands large and small number of approximately 17,504 islands. Three quarters of its territory is the ocean (5.9 million km<sup>2</sup>), with a 95,161 km long coastline, the second longest in the world after Canada. This makes Indonesia the world's largest archipelago in the world (Lasabuda, 2013). *Intelligente Salzfabrik* is a concept that will be focused on creating a new and first salt industry in Indonesia that combines the concept of efficiency and high effectiveness. It will compete with high quality imported raw materials but has an economical price. Site selection system is very important and the selected area is coastal areas. The development of *Intelligente Salzfabrik* industrial estate is expected to optimize the geographical conditions of Indonesia. Development is done near the coast so that the raw materials of sea flow can be easily obtained without the huge cost for transportation, and the existence of sea toll can be utilized to facilitate the distribution of salt produced.



Figure 1. Industrial Development Locations of *Intelligente Salzfabrik* (Source: Author)

The energy source system also comes from wave power around the sea; it is also expected to be a pilot plant that carries the concept of green-factory. The working system of a sea wave power plant will be made with a concrete tube installed at a certain height on the beach and its ends are installed below sea level. When there are waves coming to the shore, the water in the concrete tube pushes the air in the tube located on land (Wijaya, 2010). The opposite movement occurs when the waves subside. This alternating air movement is used to rotate the turbine connected to a power plant. There is a special tool installed on the turbine so that the turbine rotates in only one direction.

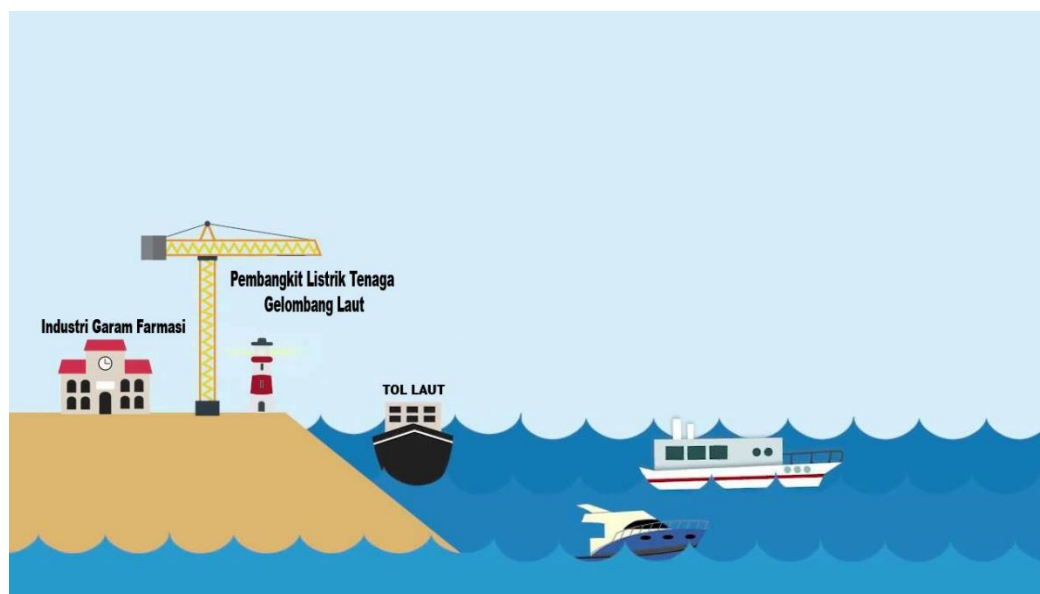


Figure 2. Design Development of *Intelligente Salzfabrik* (Source: Author)

The presence of weather anomalies which is the high rainfall in the dry season is one of the factors why salt production fails. The salt produced by farmers and the national salt industries is the salt produced only by the evaporation process of seawater, where evaporation is only aimed at evaporating water molecules and separating some of the hygroscopic compounds present in seawater. As a result, the salt produced by the evaporation process contains only 86%

- 92% of NaCl crystals. This value is certainly far below the minimum requirement of NaCl content for industrial needs. The saturated brine mechanism or coarse salt derived from the soil or sea are the mechanisms used in vacuum pan process. It is expected to increase the effectiveness of the system in the room without using the solar system. The separation of impurity compounds is performed using a combination of physical processes and chemical reactions. In this integrated industrial area, it will produce three specifications of salt including table salt, industrial salt, and pharmaceutical salt.

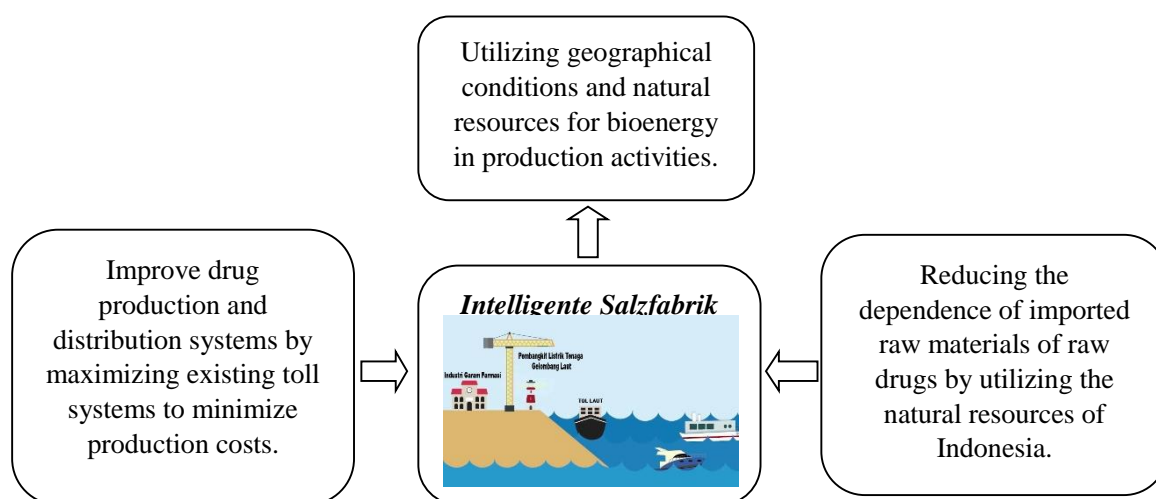


Figure 3. Positive impact of *Intelligente Salzfabrik* (Source: Author)

## CONCLUSION

Pharmaceutical salts have an important role in medicine raw materials and cosmetic ingredients. Preparation of salt by the process of vacuum pan (Multiple Effect Evaporation) is usually used saturated brine process or coarse salt mixed from the soil or sea. The length of the Indonesian sea line is very wide, but technical processing is still lacking. The development of *Intelligente Salzfabrik* industrial estate is expected to optimize the geographical conditions of Indonesia. The development is carried out near the coast so that the raw materials of sea flow can be easily obtained without the huge cost for transportation, and the existence of sea toll can be utilized to facilitate the distribution of salt produced. The energy source system also comes from wave power around the sea and it is also expected to be a pilot plant that carries the concept of green-factory. The presence of weather anomalies which is the high rainfall in the dry season, is one of the factors why salt production fails. The saturated brine mechanism or coarse salt derived from the soil or sea are the mechanisms used in vacuum pan process. It is expected to increase the effectiveness of the system in the room without using the solar system.

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## REFERENCES

- Badan Pusat Statistik. (2015). Distribusi Perdagangan Komoditi Garam Indonesia. Diunduh tanggal 20 November 2017 dari [www.bps.go.id](http://www.bps.go.id).
- Biro Umum dan Humas Departemen Perindustrian dan Perdagangan. (2004). Impor Garam Dilarang, mulai 1 Juli sampai 31 Desember 2004.
- BPPT, 2013. *Penjajakan Kerjasama BPPT - PT Kimia Farma dalam Rangka Produksi Garam Farmasetis*. <https://www.bppt.go.id>. Akses : 20 Desember 2017
- Buletin Infarkes. 2016. Upaya Kemandirian Produksi Bahan Baku Obat Indonesia. Maret-April. Halaman 3-9. Jakarta
- Kementerian Kelautan dan Perikanan (KKP). (2015a). Neraca Garam Nasional Tahun 2011 – 2014. Tidak dipublikasikan.
- Kementerian Perindustrian (Kemenperin). (2015). Rencana Strategis Kementerian Perindustrian 2015-2019.
- Kimia Farma, 2016. *PT Kimia Farma (Persero) Tbk Bangun Pabrik Bahan Baku Garam Farmasi*. Bandung. <https://www.kimiafarma.co.id>. Akses : 1 Desember 2017
- Lasabuda, Ridwan. 2013. Pembangunan Wilayah Pesisir dan Lautan dalam Perspektif Negara Kepulauan Republik Indonesia. *Jurnal Ilmiah Platax* I(2) : 92-101 Januari 2013 ISSN: 2302-3589
- Transparency Market Research. (2015). Sodium Chloride Market - Global Industri Analysis, Size, Share, Trends and Forecast 2015 - 2023.
- Wijaya, Arta. 2010. Pembangkit Listrik Tenaga Gelombang Laut Menggunakan Teknologi Oscilating Water Column Di Perairan Bali. *Teknologi Elektro* 9(2) : 164-174