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To cite this article: Wahyu Lestari *et al* 2019 *J. Phys.: Conf. Ser.* **1424** 012050

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# Technology Development of Salt Products Using Geomembrane Thread Filter Technology in Kajhu Village Baitussalam, Aceh Besar

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**Abstract.** The purpose of this community service is to increase sales turnover and expand the thread filter technology technique. The method of implementing the service activities in this program aims to improve the welfare of the people who work as salt farmers who previously processed salt using traditional techniques. Therefore, this service activity desires to develop and apply the latest technology, namely Thread Filter and/or Geomembrane (plastic), to provide solutions to salt farmers in developing their business in an easier and more modern way which increases the quantity and quality of the salt produced. Besides, through this service salt farmers are also trained on how to process salt into nanoparticles, as a good product for skin care. Thus, the salt production process will be easier and faster and the benefits obtained by salt farmers will be higher. In this service activity, it will focus on traditional salt farmers to be able to switch and apply the technology of thread filter (TUF) or Geomembrane (plastic) as a process of making salt easily and competently for the community. The results showed that using Thread Filter Technology (TUF) was able to produce results of four to five tons after using geomembrane. Previously without using TUF farmers from the village were only able to produce three tons of salt. The prospect of salt farm business is profitable when applied the techniques of TUF or geomembrane. Finally, the salt farmers can earn income significantly.

**Keywords:** Sea sand, salt, iodized, thread filter, skin care

## 1. Introduction

### 1.1. Situation Analysis

The Salt Industry in Indonesia, especially in Aceh is part of the creative industry which is currently promoted by the government to create prosperity and increase employment opportunities for the Acehnese people. The demand of salt in the daily lives of people is high, it makes the salt industry not only act as an economic commodity but as a fulfillment of the consumptive of housewives as a complement to spices. Salt is one of the most needed ingredients for the Acehnese people. So, it is not



surprising that many salt industries in Aceh are commodities that are profitable to the sustainability of human resources.

However, from these various potentials, it can be observed that the competitiveness of various salt products in Aceh is still not optimal, such as packaging design which is less attractive and seems cheap or less trendy, it is a result of minor innovation and creation and quality of products. Therefore, to maintain its sustainability, Aceh's food production, especially salt processing, must be touched by innovation, aesthetics, creativity and improving the quality and diversification of products. Furthermore, innovation, aesthetics, creativity, quality and product diversification can be realized from the variety of products, a combination of raw materials, high level of precision/product neatness, and the effectiveness of product accessories. Finally, these salt products will be more attractive and attractive and easily marketed, both as a local and national community.

## 1.2 Salt Production Process

The salt production process is conducted in a general way, namely by evaporation of sunlight, usually, the salt farmers make salt using the method of plots for evaporation. Salt farmers directly vaporize the flow of seawater in partitions to produce levels of Baume (it is the density of liquid/density/thickness) in salt. The results obtained at each salt processing are very dependent on the sun's weather. If the dry season, salt farmers can process and produce a lot of salt, and vice versa if the rainy season and there is no solar heat for evaporation, the farmers stop production until the weather improves again. In the final stages of the packaging process, salt is packaged in a simple manner with transparent white plastic and then distributed to small kiosks in Aceh Besar.

Hence, salt farmer produces 200 kg of salt in a day. For example, Mr. Muslem Yusuf managed the business for around 9 years. All production activities are held with his family. The salt processing that he is working on is still fairly traditional, starting from cooking using a traditional stove, and the process of crystallizing salt is very influential on the weather, even if the rainy season arrives, Mr. Muslem Yusuf is forced not to produce salt until the weather returns to light. During the dry season, salt production can reach up to 3 tons of salt per month, while in the rainy season it is only 1.5 tons. With this production capacity, Mr. Muslem Yusuf obtained an average income of Rp. 1.600.000 per month depending on the level of weather and the production process.

Mr. Muslem Yusuf salt production has not used proper packaging and does not competitively in the market because he still uses plain white plastic for its packaging, it does not reach the market extensively. The selling price per package is Rp8.000 per kg, depending on demand, if consumers buy salt that has not been packaged with large quantities it will cheaper. The development of products that are still low and lack of expertise in the aspect of marketing their products, namely they sell their products by depositing salt in every kiosk in the area of Aceh Besar because according to him this method is an effective way to market the product.

To improve the quality of salt production which is currently a market demand, salt farmers must be willing to add the available facilities. Because at present the production of salt is considered to not meet SNI requirements, namely the low NaCl value, the brownish color, and fragile color. Therefore to overcome the existing problems geomembrane technology is currently being developed. In the geomembrane technology, the entire crystallization table is coated with plastic sheeting to ensure the cleanliness of salt production.

Moreover, Geomembrane technology is suitable for cultivating salt during the salt production period, the farmers can harvest the salt continuously. The farmers do not need to worry about the quality of the salt produced because the salt crystals do not come into contact with the ground, it will result in white, clean and weighty salt crystals. In addition to the crystallization table coated with plastic sheeting also on the old water intake channel from the old water reservoir to the crystallization table, it needs to be coated with plastic tarpaulin, this is intended to prevent soil sludge in the intake channel from being brought into the crystallization table, divide the entry of old water into the crystallization table.

### 1.3 The Problem of Salt Industry

There are several priority issues to be resolved in the salt production business becomes more developed in the aspects of production, management aspects, and business marketing aspects. There are the following issues:

#### a. Production Aspect

- Branding the product of salt business to be easy for marketed widely and no longer use ordinary plastic.
- Training the ability of group members to combine other ingredients in producing salt, such as adding iodine.
- Improved production equipment that is more adequate (for example More sophisticated cauldron burners and other equipment).

#### b. Management Aspect

- Increase salt quality and quantity
- Management training in business improvement.
- Control the salt industry in order to develop.

#### c. Marketing Aspect

- There are many marketable salt products it is caused local salt products to be less attractive in the market.
- The marketing process is not conducted effectively.

## 2. Methodology

The community service activities held included product creativity and increased management capacity/partner business organizations. Therefore, the implementation of science and technology was carried out through a comprehensive and multidisciplinary approach. The program also involves the community of Sira Kajhu "Acehnese Salt" group as beneficiaries of the program.

The training method is designed using a participatory approach with reference to the andragogy learning process, through an approach:

- 1) Presentation of material equipped with PowerPoint Presentations and simulations
- 2) Discussion: limited, group
- 3) Practice, and
- 4) Feedback from business actors in the form of understanding the material provided.

Production capacity improvement is carried out through two pieces of training including:

- 1) Training in innovation and creativity of Aceh salt products,
- 2) Procurement of combustion engines and other processing equipment, both of which are accompanied by assistance.
- 3) Mentoring is done by involving experts in culinary and salt flavors Aceh.

To improve capabilities in marketing, partners will be given material related to marketing techniques such as determining target consumers, analyzing the market or consumer needs, creating unique products and having design creativity, product marketing through the internet (web), making brand and product logos, and market development techniques and market breakthroughs.

Development in the field of HR is carried out through training and development of worker expertise, increased collaboration among group members. Besides, there is also a development of strategies for creating a group environment situation to brainstorm or create ideas in a short time, and provide motivation to the Sira Kajhu group to generate enthusiasm for producing innovative products, creative and obtained a high market value.

Training and mentoring preparation of financial reports accompanied by a prepared format. The implementation of the financial recording cycle is provided in accordance with the needs of business actors and financial institutions that will help businesses obtain business capital loans. This

activity starts with collecting transaction evidence. Training and mentoring the preparation of financial reports accompanied by a prepared format. The application of the financial recording cycle is provided according to needs.

Monitoring and evaluation were conducted during the activities using data that had been collected in this service activity, including diaries, FGDs (discussions with the Sira Kajhu group), and observations to produce conclusions and recommendations on the overall activities.

The community service program includes product creativity and capacity building for partner management/business organizations. Therefore, the implementation of science and technology is carried out through a comprehensive and multidisciplinary approach. Increasing production capacity is carried out through the stages of salt processing creativity training, by utilizing other parties who have expertise in related fields.

### 3. Community Service Result

The purpose of this community service is to increase the income of salt entrepreneurs by introducing the technique of Geomembrane Thread Filter (TUF) of salt production. In the process of making salt using Geomembrane, it requires modification of farmland by adding threads in the initial stages with the aim of accelerating the aging process of seawater.

In this technique, the thread filter is made in the form of a partition of a winding soil pool with an uneven base to create a natural flow of water so that the evaporation process is assisted by sunlight and wind. Then, the presence of a thread filter it is expected to accelerate the aging of seawater, the production process is shorter than 40 days of land preparation until production becomes 25 days.

The problems faced by salt entrepreneurs have been going on from the beginning, starting from the process of salt production, packaging, and marketing. Inadequate production equipment and appropriate science and procedures in the process of making salt in a modern way are still lack of understanding by salt entrepreneurs. Moreover, salt entrepreneurs still rely on the knowledge they learn on their own based on the experience they have gotten from previous farmers and surrounding communities who have the same business.

However, during the dry season, salt production can reach 3 tons every month, while the rainy season is only 1.5 tons. With this production capacity, Mr. Muslim Yusuf as a salt farmer obtained an average income of Rp1.600.000 per month depending on the level of weather and the production process. The selling price of salt per 1 kg is Rp8000 because the packaging of the salt product is attractive which influence the income is less profitable then the opportunity to expand the business cannot be achieved.

Regarding the current problems, in order to increase the production and quality of salt farmers, they need to be involved with technology for the salt farmers. Thus, for increasing production, it is necessary to arrange existing land, namely changing land from traditional to semi-intensive, because on traditional land it generally consists of light reservoirs, ponds, crystallization tables while old water reservoirs are only around the crystallization table with trenches. In semi-intensive land consists of light reservoirs, ponds, threaded pools, venerable water reservoirs, and crystallization tables. From these differences in semi-intensive land, old water will be quickly obtained, namely, by adding a screw pool, and to increase salt production, the crystallization table is expanded. It is not necessary to worry about a shortage of venerable water because venerable water stocks are available in venerable water storage ponds.

In this activity, it is more focused on the technique of developing the salt industry using Geomembrane Filter (TUF) Technology. The main principle of this technology is to accelerate the process of making venerable water (20° Be) by extending the flow of water and still maintaining clean water. The process of maintaining clean water is done by installing a filter on the water channel. Finally, the last step is to put the iodine into salt.

, there was no iodine in it.

However, after finishing the program, there are other activities held, it is making the salt into iodized salt. The purpose is that salt in the village can also be a healthy salt that is useful for people who consume it. Then, the new packaging design is provided. The design uses a new logo and it is in the form of thin plastic and thick plastic. The aim is to attract buyers to buy salt in the village.

Thus, the next is conducting counseling. Service extension activities were attended by salt business partners, namely partners in the salt production business group and salt marketing business group. Besides, this counseling activities also participated by village officials and communities who are interested in salt production.

In this event, there three invited speakers from Syiah Kuala University, Mr. Fahrizal., STP.,MA who discussed salt processing and production using Geomembrane and Thread Filter Technology (TUF) and the second speaker was from the Department of Chemistry of the Syiah University, she is Ratu Fazli Inda Rahmayani, S.Pd., M.Sc., which talks about processing salt through nanoparticles into cosmetic products. Then, the last speaker is Mr.Dr. Mulia Saputra., SE., M.Sc., Ak, who speak about how to make profits from salt production and how to streamline the efficient and profitable marketing process.

Furthermore, this activity will continue with nanoparticle filtering into cosmetics. These cosmetic examinations will be held at Balai POM until the licensing process in order to be legal in selling the salt for cosmetics.

Regarding these service activities, the results obtained were double the number of salt processing production, and selling quantity of sale has been increased. This is because of implementing an efficient marketing system. Then cosmetics produced from these salts can be bought and sold for skin health. This activity generated in the increase the marketing of salt makers increased production and raise profits for salt farmers.

#### 4. Conclusion

This community service introduces the pattern of producing salt from traditional into the modern system by using thread filters technology (TUF) and it results that salt entrepreneurs find more and cleaner salt products than the previous production. This activity has presented by a speaker who talked about the salt production process and then filtered it using nanoparticles to produce cosmetics product for skin care. Then, the last it was the process of marketing the product to increase the benefit for the salt farmers group. Finally, the speaker discussed how to achieve maximum profits from the sale of salt and cosmetic products and also introducing efficient and effective marketing flow.

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