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**EXPLORATION OF ORIGINAL SCIENCE (INDEGENOUS SCIENCE) SALT  
FARMERS IN THE TRADITIONAL SALT PRODUCTION AS A RELIABLE  
EFFECT OF CHEMICAL LARGE BASED MATERIALS**

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Abstract

One of the concepts of indigenous science that can be explored is local knowledge of traditional salt production. This study aims to describe the condition of indigenous science of Central Java salt farmers in the salt production process. The design of this research is survey and descriptive research. This research uses qualitative research approach through ethnosains. The background of this research is salt farming area located in two regencies in Central Java, namely Jepara and Pati districts. This research is a qualitative research. Researchers in this study relate to several key informants (key person) and other informants and involve respondents and research participants. The next informant was determined based on the instruction of the selected key informant using purposive and snowball sampling principles. The process of data analysis in this study is done simultaneously and cyclic with the data collection process. It also uses data triangulation techniques through analysis of several data sources be it primary or secondary data. The result of this research is document of indegenous science condition of farmer daram in traditional salt production process. Furthermore, the document can be developed into teaching materials based on local wisdom.

**Key words:** *local wisdom, indegeneous science, salt farmers, teaching materials*

### **I. Introduction**

Local wisdom is the value of noble values prevailing in the life order of society. Something that has been attached to the community and has become a hallmark of certain areas and hereditary and has been recognized by the wider community. One of the traditional local wisdom of Central Java is the making of traditional salt in Jepara and Pati districts. Traditional salt making has been implemented or known by the community starting from year. Original science about the process of salt generation is developing generations between generations that exist in a family so it is still preserved until now.

The development of science education is strongly influenced by the rapid development of science and technology. The development of science and technology then gave birth to formal science as it has been taught in schools. While in the traditional community there is original knowledge (original science) on how to behave towards nature in the form of customs and messages that are trusted by the community and delivered from generation to generation. This form of indigenous knowledge has not been systematically structured in the form of concepts applied to the curriculum and implemented in formal education, but in the form of messages and messages passed from generation to generation in an indigenous community such as how to preserve forests, how to grow crops, how to catch Fish, and so forth.

Knowledge that lives in society and has not experienced this formalization ditrasformasikan into scientific knowledge, it can be utilized in the learning process as a source or alternative science learning media. The original science knowledge in society, its development pattern is continuously passed between generations, is not structured systematically in a curriculum, is local, informal, and generally a knowledge of people's perception of a natural phenomenon (Battiste, 2005). While scientific knowledge of science







  
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<p>production.</p> <p>A. Stage of drying land</p> <p>B. Wastewater treatment / reservoir</p> <p>C. Groundwater treatment</p> <p>D. Stage of crystallization</p> <p>E. The levy stage</p> <p>6. Technical factors affecting salt production.</p>	<p>results</p> <p>2) Why the yield of salt on each farm may be different</p> <p>3) How to obtain products with good quality</p> <p>1) Is there a drying process prior to treating sea water to become salt?</p> <p>2) What is the purpose of the land drainage activity?</p> <p>1) What is the process of water treatment?</p> <p>2) Is there a difference between water wasting and seawater?</p> <p>3) What is the purpose of this processing?</p> <p>1) What is the purpose of groundwater treatment?</p> <p>1) When is the crystallization stage done?</p> <p>2) What is the purpose of the crystallization stage?</p> <p>1) When are the charges levied?</p> <p>2) How the salt obtained from the levy stage</p> <p>1) Anything that affects salt production results</p> <p>2) Why the yield of salt on each farm may be different</p> <p>3) How to obtain products with good quality</p>
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**1. Description of Indegenius Science Respondents NA**

NA is a salt farmer who has a primary school education background. NA started as a pond or salt farmer since 1990. NA obtained the science of salt making from NA parents. How to make salt is derived. NA states that the source of experience is self-taught from caring for parents and participating in helping parents in salt farming. NA has land for salt farming is a lease land. The land is 1.5 ha with a price of Rp. 15 million / year. Experience and knowledge of traditional salt production developed with the counseling from the



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**Figure 1**

"After the process of harvesting the bitterns in the stream again into the box bean then added again with young sea water. This is done because to accelerate the process of salt formation again "assumption of pack NA, yes it will be more easily formed white crystals, but keep in mind that the oldest water content is the most dominant is Magnesium. The color of magnesium is also white, so it is possible that the salt still contains magnesium.

The technical factors affecting sea salt production are weather conditions, according to NA in the presence of rain can result in a point in brown salt. Soil processing for soil preparation also affects the salt yield, if the sea water is used too little then the salt produced is too little, and if too much then the evaporation process that happened too long, the way salt levy must also be careful, Air Bittern if too old salt produced bit bitter. The longer the age of sea water in the salt box or the salt table the resulting crystals become larger. This happens because there is continuous evaporation. But if too long the salt water or the harvesting process is not done immediately then there is clumping. The use of a tarpaulin as a foundation on the salt table, can produce a salt with a high enough level and the salt obtained is good.

**2. Description of Indegenius Science Respondents HA**

HA is a salt farmer who has high perseverance. Science obtained by amateur with see and observe HA parents when in has been a salt farmer for 4 years learn from parents. The motivation of being a salt farmer is to utilize the existing land and to earn additional income. Beginning began to be forced salt farmers, because the area is close to the north sea.

Determination of salting location in accordance with existing land. So according to HA all the land can be used, but according to HA land that its red color is less good if used as salt land. If drying is approximately 1 month, so the soil becomes cracked. The more dry the salt field before beat then the better the results. The dry land is not mixed with salt.

The traditional salt production process originated from seawater flowed into pond ponds, from pond wells used "ebor" to move sea water into the first salt table. The use of "ebor" or scoop is associated with wood, then with a pole embedded in the ground. How this ebor works by swinging the wood until it is full and then raised up and directed toward the first salt table (bean). The use of ebor is very time consuming and energy and discomfort due to exposure to very hot sun. The use of windmills has not been done by HA. Although some places already exist that use a windmill. The presence of sunburn every day makes the skin of salt farmers become black and feels thick. This is also in accordance with research Elisabeth (2002) that salt farmers experience health problems such as pain in the eyes and also a high level of consumption. The need for standardization of places in the manufacture of salt is necessary to reduce the health disorder.

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The second process after the transfer of sea water to the first table with a depth of 1 meter is wait to level baumemeter  $\pm 20$  Be. After that stage, the sea level is added to the level of 20 Be into the second pond plot with a depth of 7 cm. The help of sunlight and wind, then the sea water can crystallize. The crystallization process lasts for 1 week. After seawater crystallizes, it is done by leveling and compacting the land using a wooden broker. Then wait three to five days and tested using baumometer with drajat Be = 22. The next process of flowing to the table gram with waiting approximately five days sehigga have degree Be = 27. This shows the salt on the table salt ready to harvest. The process of salt harvesting is still manual that is using a rake of wood, collecting salt on the edge of the pond and then put into the sack. Usually the harvest is dried first. The table preparation for the crystallization process is shown in FIG. 2.



Figure 2. The soil compaction process using the selender

The process with water is always flowing, the water enters the crystallization table for more than 20 days, if less than 20 days the soil becomes loose so the salt becomes black, the difference in the salt yield with the tarpaulin and not is, which uses the tarpaulin easily harvested, the result is whiter, the more time Long, while without tarpaulins difficult to harvest and shorter time. Salt is harvested after Be 25 and above, old water is mixed again with young water to make salt faster again. After 3 harvests the results are not much more, red soil makes the results are not good. Result first salt leveled with soil and then added with the same BE water, the second result is newly harvested. Before there is a test water size with cigarettes, young water floating or floating, old water drowned.

**3. Description of Indegenius Science of Respondents MU**

MU is a diligent farmer and extraordinary spirit. MU has 9 years become salt farmers and have their own land. MU studied the process of making salt, learning from the parent. Land used to produce approximately 90 tons / season. MU motivation in salt farming is the need for survival and family. In addition to being a salt farmer MU also work as a carpenter. Making the wood as a side when not in salt and during the rainy season.

Implementation of drying of land approximately 1 month, can cause land not yet dry. So the process of using land waits until the soil is cracked (indicating the soil is dry). The drying of the land will affect the quality and quantity of salt. Land used as a table of salt according to MU drier then the result is better because the soil is not mixed with salt.

Water treatment process from seawater, then accommodated in the water reservoir or well, from the shelter is transferred to the table bean with windmills. The shelter is in the zig zag method. The zigzag method is a method of water flow in the process of clearance. The goal is that absorption and evaporation happen faster. According to MU the harvesting

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process is done when  $Be > 25$ , if degree baume has not reached 25 then it must be streamed again. According to the MU selection of transfer or crystallization based on the height of the soil, from the place of bean has a higher altitude compared with the salt table. The salt table is also higher than the remaining table or bittern place. According MU to reduce leakage on the table bean then done the process of making for compaction. In addition MU also uses insect repellent to kill animals. With the existence of insect animals such as whole and worms, as well as ants will result in holes, with the hole can disturb the density of the soil. Soil silinder to be solid and flat, and the results are better because it is hotter.

According to MU salt results will be better if using Geoisolator. Geoisolator is a base system of thick plastic material (tarpaulin) is black. The use of geoisolator is provided by the district government with PUGAR guidance. PUGAR in jepara district is quite proactive, PUGAR chairman can facilitate activities and also has an information network. Processing and training process is also carried out by PUGAR yag facilitated by the Department of Maritime and Fisheries Jepara. The obstacle faced by PUGAR is public awareness to improve the quality of salt and its quantity. Figure 3 is an application of Baumemeter usage,



**Figure3. Using Of Baometer**

The use of geoisolator can pay attention to the processing speed and quality of salt yields that have high levels. Measure MU NaCl levels higher by using geooisolator. Factors that affect salt production result is rainfall, If exposed to rain water salt to yellow. The salt crystal becomes brown. According MU if terajdi rain in mid-season then the land must be drained first. So given the young water again and start from the process of bean. If not drained the size of the crystal is not stable. And crystalline results tend to have very little weight. After the process of bleaching until the crystallization process, water is crystallized + water of removal (not disposed). Exposure from MU that water on salt table more than 27 degree baume then white foam. Factors that affect: the journey of water and sunlight. Moving from box 1 to another box after the 2-strip membrane size, so if you want water with Be 27 there is 13 flow follow exposure from brother MU.

**4. Description of Indegenius Science US Respondents**

The US is the head of the existing service in Pati regency. Salt farmers have been around since the VOC days, initially in determining that water is ready to be salt or dipaen using bamboo filled with sea water or salt water in bamboo is given bamboo sticks and given lines scale unit. Along with the development of the era, now began to be used tool to know Be water that can be a salt that is Baumometer, currently salt farmers are being pursued so that all get the help of tarpaulin / geoisolator for the results of salt production better and more, besides salt farmers group managers Are being counseled on all salt-related matters with the aim of being forwarded to all the salt farmers under it, the only obstacles faced are many



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farmers who know the problems faced is the farmers know the process of making salt for the best results, but many fishermen are still reluctant to do so. This is because the habit factor and usually takes a little longer time, other than that the low price of salt is also an inhibiting factor, because as good as any salt obtained the price is not much adrift with other salts, so that many farmers who think practical, important results Many with prices in general rather than fewer results at a marginally small price which in the end when calculated results are not much different.

The results of the analysis of the original science that has been found in the salt farming communities in the area of jepara, starch and rembang, revealed that the original science is related to the daily life of hereditary community or inheritance from parents. This original science is part of the life or culture of society that is still maintained and believed to be true. This original science is retained because they see and experience their own truth based on life experiences (natural experiments) over the years from one generation to the next through the process of adaptation to the natural and cultural environment in which they are. Unlike Western science, original science is still in the form of concrete experience knowledge, whereas Western science is a reproducible concept, principle, theory or law (tested experimentally in the laboratory) and has been recognized by the scientific community . This original science knowledge is transformed through the oral tradition of their parents' "parent" to the next generation and concrete experience in interacting with their environment. In the course of time, it is possible that the entry of new cultures in accordance with the development of science and technology, but the thoughts (beliefs) inherited from the previous generation is still maintained.

These findings can serve as a basis for reconstructing the original science curriculum on salt farmers. The activities that need to be done in reconstructing the understanding of salt making by transforming to learners which is expected to help students in learning science without having to leave the cultural roots.

#### **IV. Conclusion**

Based on the results of this study, it is concluded that the salt pembuatan process starts from the preparation of tools and materials are very simple, some tools are meter, pump, windmill, selender, hoe, crowbar, scop, rake. Furthermore, the traditional process of salt making through four processes, namely Enter the sea water into the first saline saline plot, Enter the sea water with levels of 20 Be into the second pond plot with a depth of 7 cm, The third process is the buildup. Enter the sea water with levels above 20 Be (22-25 Be) into the second pond plot, Salt taking is done once a week. Factor influencing factor is weather because during this time sun and also geothermal as energy source in crystallization process.

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