



CONSTRAINTS AND CHALLENGES OF SALT FARMING IN OCCIDENTAL MINDORO, PHILIPPINES

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ABSTRACT:

This study drew the profile of the salt farm owners and farmers in Occidental Mindoro, Philippines; their salt production characteristics in terms of salt farm size, material used for salt beds and intended use of the salt produced and post-harvest practices. It also identified the constraints and challenges faced by the salt farm owners and farmers. Key Informant Interview using an interview guide was used to gather data from 52 salt farm owners/farmers. Results of the study indicate that the salt farm owners and farmers are males, between 41-55 years old married and belong to large households. The salt production area is 10 hectares or less, clay (from Vigan) and stones are used to line the crystallizers, and salt produced include agricultural grade salt for the coconut fertilization, yellow quality raw salt for bagoong and dried fish production, cleaning purposes, green quality raw salt for human consumption, iodized salt for human consumption (table salt), washed and refined salt for human consumption (table salt) and food industries (chips, biscuits). Findings of the study also revealed that majority of the salt farmers did not own a warehouse to store their salt and used sacks to package the salt. It is recommended that the Occidental Mindoro Salt Industry Road Map be translated into reality by providing government support to the industry in the form of research and development projects and programs on salt production, post-harvest, logistics and marketing strategies, provision of loan facility to augment capitalization and encourage industry-academe and government line agencies collaboration for an inclusive Occidental Mindoro Salt Industry revitalization.

Keywords: *salt production, solar evaporation salt, constraints in salt production*

INTRODUCTION

Sodium chloride or common salt, or halite is a white crystalline chemical compound with the chemical formula of NaCl. It is an abundant mineral employed in the manufacturing industries, agricultural and water-conditioning uses. It is also commonly used in the food industry as a flavor enhancer and a daily diet requirement for humans. (Jumaeri, et, al, 2017) .Salt production by solar evaporation is widely practice around the world. (Hosain, et.al, 2006). In fact, a third of the world's total salt production is attributed to evaporation of brines from seawater. (Sedivy, 2009).

In 1990, the Philippines' salt production supplied 85% of the country's total salt demand of 338,000 MT with Occidental Mindoro supplying 60,000 MT. In 2018, only 20% of the national salt demand is fulfilled by the local salt industry, the remaining 80% supplied by imported salt. (DOST, 2017). Coastlines and foreshores are a key strategic assets to solar salt production given that Occidental Mindoro is an island province, however, over the years, salt production in the province is shrinking over the years due to a number of factors which include erratic weather patterns due to climate change, production losses, poor logistics, poor production and organizational management, water pollution, lack of research and development activities on salt productivity and few policies in place to support the industry. The Occidental Mindoro's shrinking salt industry is a cause of concern. There are approximately 4,000 salt beds tended to by around 3,600 farm workers and others who are indirectly employed by the industry. (TAMACO, 2019)

Today, while Occidental Mindoro still supplies salt in the neighbouring provinces in Southern Luzon, Visayas, and Mindanao, only 12 percent of the national salt requirement comes from the province with the biggest chunk of the demand supplied by imported salts (Duque, 2019). Seeing the potential of the salt industry to help drive the local economy of the province, a multi-sectoral Occidental Mindoro Salt Council was created in 2018 which pieced together a roadmap for the Occidental Mindoro Salt industry with the end view of developing a salt industry that meets the domestic and international standards in order to provide equitable benefits by using socially responsible and environment-friendly practices.

The roadmap envisioned that by 2022, the province of Occidental Mindoro shall be known as the Salt Capital of the Philippines producing high quality salt products at competitive prices for the domestic market catering to the consumers, food processors, industrial and agricultural users. (DTI, 2018). To give flesh to the Road Map interventions, baseline data on the solar salt production constraints and challenges, including the farm-level technologies used, To date, there is a dearth of data on the challenges and constraints experienced by the salt farm owners and farmers which could be used to design programs and projects to help revitalize this shrinking industry in the Province.

The purpose of this study was to determine the salt production challenges and constraints in Occidental Mindoro so that interventions may be identified to help revitalize the salt industry. Specifically, this sought to:

1. determine the salt farmers' profile in terms of:
 - a. age
 - b. sex
 - c. marital status
 - d. household size
2. Ascertain the salt production characteristics as to:
 - a. land area in hectares, used for salt production
 - b. type of material used for salt beds
 - c. type of crystallization pond;
 - d. average salt yield per salt bed;
 - e. use of salt produced;
 - f. storage and warehousing practices
3. Determine the constraints and challenges experienced by the salt farm owners and farmers

MATERIALS AND METHODS

Research Design

This is a descriptive study which gathered data using Key informant interview (KII) employing an interview guide from the salt farmers and farm owners. Where possible, focus group discussions were also done to elicit first hand information from the salt farmers/owners.

Study Site

The study covered the municipalities of San Jose and Magsaysay, Occidental Mindoro the top salt producing towns in Occidental Mindoro. The barangays sampled in San Jose were, Labangn Barrio Site, Mapaya,, Bubog and Pag-asa. Most of the respondents from the Magsaysay area were from Toong, Sibalat Sta Teresa and Laste.

Respondents of the study

A total of 52 salt farm owners/salt farmers agreed to be interviewed whose families re chiefly involved in salt production.

Data Gathering Procedure

Data for this study were obtained through the KII and focus group discussions. Answers were coded for thematic presentation.

Secondary data was also used where no or insufficient information was supplied during the interview. Where possible, focus-group discussions were also done to elicit answers to the research problems or to capture information that would not have been possibly gathered by floating the questionnaire alone.

Research Instrument

The research instrument primarily used was an interview guide so designed to elicit specific information from the respondents to answer the research problems. Triangulation was done to validate answers and to draw more depth into the answers given by the respondents.

Data Analysis

Answers were tabulated and processed where mean and frequency counts were mostly used.

RESULTS AND DISCUSSION

Profile of the Salt Farm Owners/Salt Farmers

In terms of age, the results of the study revealed that 50% (100) of the respondents belonged to the age range of from 41-55, while 18 (34.6%) . A very small percentage at 1.9% of the respondents is aged 70 years and above. These findings suggest that middle aged to advanced aged farmers/farm owners dominated the respondents. Focus group discussion results indicate that younger generations of salt farmers or their young family members are reluctant to embrace the salt making trade . These realities may leave no one to pass on the salt making skills and could push the long time tradition of salt farming into obscurity (Acedo and Hontucan, 2017).

The salt industry in Occidental Mindoro is largely male dominated at 82.7 % . Women constitute only 17.3% of the respondents. It is not uncommon however that family members both male and female share in the salt harvest chore at the crystallizers. Salt harvest as revealed by the respondents is a very labor-intensive activity in salt making. Hauling the harvest from the crystallizing ponds is considered a task for males.

Most of the salt farm owners/farmers are married (80.8%) with 9.6 % each as single or widow/widower. For most of the respondents, salt making is their way of life and source of income for the family. Some have brought their families close to the salt farms especially during the harvest season which happen during the months of January, February, March, April and May.

Most salt farmers belong to medium households of 4-6 members (60%), small (1-3) and large households (7 and above) comprise 25% and 19% respectively of the salt farmers surveyed.

The salt farmers' average number of household members working in the salt farm is 3 (44%) and six of the respondents said that there are four or more members of the household

working in the salt farm. Acedo (2017) cited that the salt farmer’s children see no future in the salt farms and prefer to work in the cities rather than to embrace salt making which is labor-intensive (TAMACO, 2019)

Table 1. Profile of the salt farmers/salt farm owners.

Indicator	Frequency	Percentage
Age	18	34.6
26-40		
41-55	26	50
56-70	7	13.5
70 and above	1	1.9
Marital Status		
Single	5	9.6
Married	42	80.8
Widow/Widower	5	9.6
Sex		
Male	43	82.7
Female	9	17.3
Household Size		
1-3	13	25
4-6	29	60
7-10	10	19
Household members involved in salt farming		
1	11	21
2	12	22
3	23	44
4 and above	6	12

Salt Production Characteristics

In solar evaporation method of salt production, only 10% of the total salt production area consists of the crystallizers where salt is harvested. Ninety percent of the area is used as supply and concentration ponds where water is pumped into for subsequent evaporation until a saturated brine is produced that is transferred through wooden gates into the crystallizing ponds (Rodrigues, et. al, 2011)

Salt Production Area

In terms of salt production area farmed, 46.15% of the respondents have from more than one hectare to less than or equal to 10 hectares. About 17.3% have less than one hectare of salt production area. In the salt making industry these are called the marginal salt farmers (Susantua, et. al, 2015) . Those having salt production areas of from 25 to more than 50

hectares constitute 19.2% of the respondents. As a major salt producer for local salt, Occidental Mindoro is home to some of the biggest salt producing families in the country.

Type of Salt Beds

As to type of salt beds majority or 94.2% said that they used Vigan clay to line their crystallizing ponds. A small minority revealed that they use either plastic, cement or cement mixed with *apog* (lime) in their crystallizers. It may be noted that none of the respondents used high density polyethylene (HDPE) geomembranes, which aids in the crystallization of high quality salts. (Civan, 2016). Vigan clay as revealed by the respondents, is more affordable at PhP10.00 per kilo than other materials. Salt beds are crucial to salt making as it can dictate the quality of salt to be produced (Civan, 2016).

When asked on the use of the salt they produce, all of the respondents expressed that their produce is intended for human consumption, as fertilizer (34.6%) that is being sold to the Philippine Coconut Authority in bulk to fertilize coconut trees, as food processing ingredient (78.8%) such as fermented fish paste (*bagoong*) and fish sauce (*patis*) dried fish and other food processing methods. Moreover, 8 % cited that their salt is used for industrial purposes such as manufacture of soap, detergent, glass and other industrial products. Lastly, 29 % said that the salt they produced is used for human consumption, fertilizer, industrial additive and in food processing.

Table 2. Salt production characteristics.

Indicator	Frequency	Percentage
Area Used for Salt Production (in ha.)		
>=1	9	17
< 1 & > = 10	24	46
< 10 & > = 25	9	17
< 25 & > = 50	5	10
Above 50	5	10
Type of crystallization pond		
Shallow	51	98
Deep	1	2
Salt bed material used		
Vigan clay	49	94
Others	3	6
Use of Salt Produced		
Human Consumption	52	100
Fertilizer	18	35
Industrial Use	4	8
Food Processing	41	79
All of the above	15	29

Storage and Packaging Practices

The storage and packaging constitute essential post-harvest practices in salt making (TAMACO), 2019 . Sixty five percent of the respondents cited that they do not have a warehouse to store their salt while 34.6% said that they own a warehouse in which they store their salt harvest. Warehouse facilities are vital to the salt farming industry to store the newly harvested salt either to let the moisture dissipate during storage thereby increase the salt quality before it is marketed during the lean months.

In terms of packaging material used, 85 % of the respondents said that they use second hand sacks to pack their salt harvest, while 11 % use woven basket (kaing) to store their salt. A minority of the respondents (4%) said that they dump their salt on the ground between the salt beds which is lined with either plastic, canvas or used sack.

Table 3. Storage and packaging practices.

Indicator	Frequency	Percentage
Availability of warehouse		
With warehouse	18	34.6
Without warehouse	34	65.4
Packaging material used		
Sack	44	84.6
Woven basket (kaing)	6	11.5
Dumped on the floor	2	3.8

Production Constraints Experienced by Salt Farm Owners and farmers

A checklist was prepared enumerating the problems encountered by the salt farmers in Occidental Mindoro. The items were borne out of several focus group discussions conducted with both salt farm owners and salt farmers. The common problems were coded and clustered under a common theme which was refined to capture the most common challenges and constraints experienced by the salt farm owners and farmers.

Climate change

The challenges and constraints are resented in Table 4. Climate change and variable weather patterns is commonly experienced by the 942% of the respondents. Solar salt evaporation is heavily dependent on the temperature, humidity, solar radiation and other climatological parameters, unpredictable weather patterns brought by climate change dealt a strong blow to the salt industry in Occidental Mindoro as revealed by the respondents. Intermittent rain has also largely affected the salt production season. Beyond competition, the biggest struggle salt producers face in salt making is climate change. Sudden rains in summer & extended wet season seriously affect production. Some respondents long dry spells and extended rainy seasons heavily affect their seasonal salt yields.

Limited government support to the local salt industry

Other top challenges faced by the Occidental Mindoro salt farmers is limited government support to the local salt industry (100%). One of the respondents cited that while the Department of Science and Technology (DOST) has initiated efforts to help the Occidental Mindoro salt industry it has not trickled down to the marginal salt producers. There were very few local initiatives to help the shrinking salt industry in the province.

No government agency ‘adopting’ the salt industry

Additionally, the absence of facilities to ascertain product quality (94.2%) , limited research on salt production (61.5%) limited post-harvest technology (78.8%) ,logistics and marketing (78.8%) , lack of capitalization (76.9%) and limited post-harvest facility constitutes the major challenges experienced by the salt industry. Product quality and quality assurance are crucial to salt production since percentage composition of the salt is essential to determine its fitness for use in industrial manufacturing which comprise the biggest salt demand. With the high logistical costs, it is not conducive for small salt farm owners to market their produce to nearby provinces.

Logistics and Marketing

The lack of post-harvest facility and technology has not been fully addressed by the USAID grant of a salt washing plant in Magsaysay since not all salt farmers have access to the facility and its technology(TAMACO, 2019).

Lack of Research on optimization/improvement of local salt production

An utter lack of research on salt production and lack of capitalization force the farmers to stick to their age-old traditional salt farming methods. The lack of capitalization shove the farmers in an endless cycle of debts which often force them to downsize or fold down altogether. Some respondents said that to measure salinity, salt farmers used twigs which they dip into the brine. When the twig floats, it means the brine is in the right concentration to be transferred to the concentration pond. Others said that they step into the water and when it feels itchy, the saline water is ready for transfer to the next pond. Salt farmers trust their instincts and very rarely used scientific measurements of brine.

Table 4. Constraints and challenges of salt farming in Occidental Mindoro.

Problem/Constraint	Frequency	Percentage
1. Climate change/variable weather condition	49	94
2. Water pollution	10	19
3.Limited government support to local salt industry	52	100
4. No government agency ‘adopting’ local salt production	49	94
5.Logistics and marketing	41	79
6. Limited research on salt production	44	85
7. Limited post harvest technology and facility	41	79

8. Product quality is not uniformly established	49	94
9. Pricing of product often dictated by traders	39	75
10e. Lack of capitalization	40	77

Conclusions

Based from the findings of the study, the following are concluded: The salt farm owners/farmers in Occidental Mindoro are male, with advanced age, married and belong to large households. Majority of the salt farmers own or work in about 10 hectares of salt farm, use Vigan clay for salt beds, and produce salt for human consumption, fertilizer, food processing and industrial use. Most do not own a warehouse to store their salt and use sacks primarily to package their produce either for storage or for selling to traders or to their cooperative; and the most prevalent constraints faced by salt farm owners and farmers in Occidental Mindoro include climate change and unpredictable weather patterns heavily affecting the salt production season, lack of government support to the local salt industry, high cost of logistics, lack of capitalization, absence of facility to determine product quality and lack of post-harvest facilities and technology.

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