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VALUE CHAIN ANALYSIS OF SALT IN THE VISAYAS REGION, PHILIPPINES

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ABSTRACT

Salt is important as food, food and feeds ingredient, and many more. With its economic benefits to the entire chain participants, it is imperative to study the value chain of salt in the Visayas Region, a major salt producer. A total of 222 supply chain participants (107 salt producers, 12 assembler-wholesalers, 6 wholesalers, 13 wholesaler-retailers, 24 retailers, 3 institutional buyers, and 57 household consumers) were interviewed in May to June of 2019. Four sets of pre-tested structured interview schedules and a key informant interview guide were used. Value chain mapping was performed along with quantitative and descriptive analyses. Results revealed that the solar evaporation of seawater as the common method of salt production caused its seasonal availability which is aggravated by the lack of appropriate storage facilities. Class A salt is more profitable for farmers to produce during peak months, but Class B was the more profitable during lean months. The retailers gained the highest profit relative to their marketing costs during peak and lean months and for both Class A and B salt, although they do not sell Class B during the lean months. There is strong horizontal relationships among chain participants, but farmers had a weaker relationship with their peers along the areas of price determination, seeking buyers, and knowledge on new technologies as they tend to compete with each other, limiting their ability to benefit from collective initiatives. Non-adherence to ASIN Law hampers the movement of salt to the target markets that are located beyond municipal boundaries.

Key words: Value chain mapping, solar evaporation, salt-making, salt quality specification, horizontal and vertical integration

INTRODUCTION

Sodium chloride or salt is an abundant, readily available, and inexpensive commodity found to be a basic requirement for life (Feldman 2011; American Chemistry Council 2020). It can be found throughout the world as mineral halite or as mixed evaporates in saline water. Its composition varies from lower values near the north and south poles to higher values closer to the earth's equator, and that, it is generally gray to white, but color varies depending upon the impurities present (Feldman 2011). Three techniques are being used in salt production, namely: (1) solution mining or the production of

dry, crystalline sodium chloride from underground deposits using water followed by evaporation of the brine; (2) dry mining method or the direct extraction of the mineral halite from beneath the ground; and (3) solar salt harvesting (Morton Salt 2015). Salt-making in the Philippines is a pre-colonial industry with variations in the methods used throughout the island (Alcina 2004). However, generally, salt is produced through solar salt harvesting by the fisher folks and by coconut farmers who live in the country's shorelines (Yankowski 2019). Fisher folks are reported to be among the poorest in the country (Cervantes 2012) and among those who have the greatest number of children. Fishermen normally go out in the sea to fish while the women are left at home to do household chores and tend to the needs of the children. Thus, in salt making, it is highly possible that women and child labor are resorted to in the absence of the father-fisherman. The major requirements to produce salt are large areas of flat lands located near the brine source (e.g., the coast) with low rainfall rate, abundant sunshine, some winds to support optimum yields, and road network that is accessible to facilitate transportation of the produce (Feldman 2011).

Salt plays an important role in the Philippine economy as: (1) contributor to labor generation and poverty reduction; (2) having high local value-added product due mainly to its use of inputs like free sun and salt water, low-cost soil in shores and only the salaries and wages of salt farmers as the major cost item; (3) saver of foreign exchange; (4) key ingredient to major Philippine industries like food, coconut, dried fish, and other mixed-use industries; and (5) a key player in the elimination of iodine deficiency disorder (Philippine Chamber of Salt Producers 2009). Despite its important contribution, the domestic salt industry is losing its competitiveness. Industry reports that since 2000, the share of imported salt vis-a-vis the salt consumed in the country is increasing (Philippine Chamber of Salt Producers (2009), Yankowski (2019), Hontucan and Acedo (2017), Sadongdong (2017), Arnaldo (2017). The International Trade Center reported that the Philippines imported 80 percent or $24.4 M worth of salt in 2016 alone (Moran 2018). Among the perceived immediate effects of declining domestic salt industry because of increased salt importation are those related to the loss of employment and income redounding to escalation in poverty. It also would result to losses in foreign currency and may jeopardize salt-dependent industries like fish preservation, the coconut industry, food, and many other industries. It is only with the understanding of the interactions of participants in the domestic salt industry can the negative effects of declining industry competitiveness be mitigated and its eventual impact to salt farmers be reversed.

There is a dearth of literature concerning the Philippine salt industry. Its technology and organization have a deep-rooted relationship with the pottery industry, i.e., in Bohol, Philippines (Yankowski 2019). Profitability of small and medium scale enterprises in Misamis Oriental, Philippines was explored by Delos Reyes, et al. (2021). Further, salt farms and supply chain actors in the Visayas and Mindanao, Philippines were documented using GIS Maps (Bartolome et.al 2022). Also, the Nutrition Center of the Philippines surveyed the salt importers, producers, and traders in the Philippines for evaluation of internal and external quality assurance and control (NCP 2010). Other pioneering works document the industry status like the works of Alcina (2004), Philippine Chamber of Salt Producers (2009), and Sadongdong (2017). Given its many problems, several industry initiatives were recorded (Verdey and Abilay 2017). The response of the Philippine national government agency to calls from local government units (LGUs) asking for support for the declining salt industry in Mindoro Occidental were also documented (Verdey and Abilay 2017 and Tan 2020). An optional exemption from Salt Iodization Law that will benefit sea salt farmers who have lost their livelihood, industries that require sea salt in their recipes and products, and consumers who want to be able to choose between iodized and sea salt was proposed (Tan 2020).

With low supply of and high demand for salt (Neo 2019), potential for village-level salt processing business is very high making it imperative that a careful examination of the industry be done to see where the country has gone wrong and what can be done to improve the current situation, and maybe competitiveness. A jump-off to increasing the level of competitiveness of the domestic salt industry is to analyze it using the value chain approach. Value chain (VC) is defined as "the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use (Morris 2000)." VC analysis can expose strategic and operational misalignments within chains, and the consequential misallocation of resources, hence, provides opportunities for improvement which create value and promote sustainability (Fearne & Martinez 2012). In development works, the value chain approach has been extensively used as a mechanism to foster economic growth. It probes on modalities where poverty groups can benefit from the increase in income through strengthening of markets that are relevant to the poor, improving the poor's access to markets, and/or by influencing the distributive outcome of the market processes (Springer-Heinze 2018). There is the necessity for firms to be competitive by becoming market-oriented (Grunert et. al. 1996) but to be effective in this endeavor, their value delivery network must be coordinated by a suitable governance structure (Elg 2008).

The value chain documentation of the Philippine salt industry is basically unknown. Given the importance of salt as food, as food and feeds ingredient, and the economic benefits it brings to the entire supply chain participants (from farmers to retailers), it is imperative to study the marketing structure, the supply chain, and the value specifications vis-à-vis the demand specifications by the market. Detailed data on the salt supply and demand situation including the value-adding activities and corresponding business enabling environment and support services will help a lot in upgrading the value chain and capacitating the chain participants. From the existing literature, little is known where value is gained or lost along the salt value delivery network and how value shares as well as the risks are distributed along the different nodes of the value chain. This study is an attempt to fill-in these existing gaps with its output seen as helping enhance the growth of the industry through market-led, reconfiguration. This will be useful for policy makers, regulatory agencies, industry participants, and other stakeholders.

METHODOLOGY

The study utilized both quantitative and qualitative approaches to achieve its objectives. The following key production areas were considered: Iloilo in the Visayas Region (Philippine Chamber of Salt Producers 2009), Guimaras, and Negros Occidental (Nutrition Center of the Philippines 2010). Representative municipalities from these regions were chosen based also on volume of production. Key officials from the Offices of the Provincial Agriculturist, Municipal Agriculturist, and the local government units (LGU) were consulted regarding industry participants to form the sampling frame.

Sampling size and selection of a total of 222 respondents varied by respondent type. For the 107 producers, simple random sampling of at least 30 per area (with substitution) was done, however, if the total population in one area is less than 30, complete enumeration was resorted to. The number of traders was determined by accumulating 80 percent of the total volume traded, which in this case was achieved for 58 traders. On the other hand, the number of household respondents was determined using the Slovin's formula at 95 percent confidence level:

$n = N/(1 + Ne^2)$ where:
n = number of samples
N = total population
e = margin of error (5%)

Respondents per demand area were proportionately allocated. Institutional buyers in each area were identified using snowball technique or tracing approach. These buyers purchase large volume of salt directly from the salt producers or traders and use it as an input for their businesses such as production of fish sauce (*patis*) and fish paste (*bagoong*), processing of salted dried fish (*daing*), among others. Ten of these buyers per demand area and non-food and food users of salt were interviewed (Table 1).

Primary data were gathered using pre-tested structured interview schedules and key informant interview guide. Three sets of interview schedules were developed: producers, traders, and household users. Key informant interviews of representatives from the local government units, business sector, and NGOs directly engaged in the management, production, regulation, policy development and implementation relevant to the salt industry were conducted.

The horizontal relationship was evaluated along the following five parameters: information sharing; collaboration to sell in bulk (e.g., prices, buyers, and practices); competition level; trust (e.g. management and selling); and benefits from collective initiative. Meanwhile, vertical relationships were evaluated for the following: procurement of supply; information sharing on technology and prices; quality control (e.g., texture, color, and cleanliness); and presence of value-added services. The strength of vertical and horizontal relationships among the participants in the value chain were assessed using four scales: 0 - No Relationship; 1 – Weak; 2 - Moderate; and 3 - Strong. Chain mapping was extensively used for visual representation of the value chain. Finally, quantitative data were analyzed using descriptive statistics, i.e., means, modes, frequencies, and percentages.

RESULTS AND DISCUSSION

Profile of respondents. The demographic profile of the study participants is shown in Table 2. Participants were grouped based on their role in the salt value chain - as producers, assembler-wholesalers, wholesalers, wholesaler-retailers, retailers, institutional buyers, and household consumers. Characteristics gathered include the participant's sex, age, civil status, educational attainment, and their respective number of years in the salt industry.

The salt industry is dominated by female players (63% vs. 37% for males). Males play a more leading role in production (56%) and wholesaling (67%) whereas the rest of the processes in the value delivery network are performed principally by female players, suggesting the critical role of women in the salt industry.

The age distribution of participants varied across the nodes in the chain. Their modal age was 41 to 50 years. Among producers, the modal age group was 51 to 60 years. For those involved in salt distribution, the modal age cuts across a wide range-- assembler-wholesalers (41-60 years old),

wholesaling (31-60 years old), wholesaler-retailer (51-60 years old), and retailers (41-50 years old). Age range of institutional buyers is bimodal (41 to 50 years and 61 to 70 years).

Table 1. Distribution of 222 salt supply chain participants, Visayas, Philippines, 2018

Location	Type of Supply Chain Participant														TOTAL	
	P		A-W		W		W-R		R		IB		HC			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Iloilo	18	12	1	6	1	14	4	24	5	17	2	33	57	38	88	40
Antique	20	13	-	-	-	-	1	6	11	37	-	-	-	-	32	14
Guimaras	30	20	2	13	1	14	-	-	4	13	-	-	-	-	37	27
Negros Occidental	39	26	9	56	4	57	8	47	4	13	1	17	-	-	65	29
TOTAL	107	48	12	5	6	3	13	6	24	11	3	1	57	26	222	100

P=producer; A-W=assembler-wholesaler; W=wholesaler; W-R=wholesaler-retailer;
IB=institutional buyer; HC=household consumer

Household consumers of salt in Western Visayas are composed mostly of purchase-decision makers in their 30s and 40s. Over-all, the salt industry players are generally married (70%) and such a civil status holds through across players in the entire value chain.

Most of the respondents have limited education with approximately 70 percent not reaching college. When analyzed by education by node in the chain, most salt producers (83%) have not entered any tertiary school. Participation of players with college degrees increased in the salt distribution/trading although modal educational attainment is high school graduate among institutional buyers (33%) and household consumers (31%). Modal years of experience in the salt industry among participants is 1 to 15 and it cuts across players in all nodes of the salt value chain.

The salt industry value chain. The core processes involved in the salt value delivery network, the tasks involved at each core process, the players, and the different enablers are mapped in Figure 1. Generally, the process involved in the salt value chain in the Visayas Region starts with the provision of inputs, salt production, marketing, then consumption. It is interesting to note that provision of inputs is generally performed by external providers such as the local government units, the Bureau of Fisheries and Aquatic Resources, and by the UNICEF. There are two dominant methods of producing salt: the solar evaporation method, and the cooking method. A large proportion of producers are women (44%), are less educated (88% have not entered college) and are in their advanced life stage (76% are 40 years and older). The critical role of government agencies as enablers is evident and among those cited include the LGUs and the DA-BFAR (for input provision), the Office of the Provincial Agriculturists (during the production stage) and DTI (in the marketing of produce).

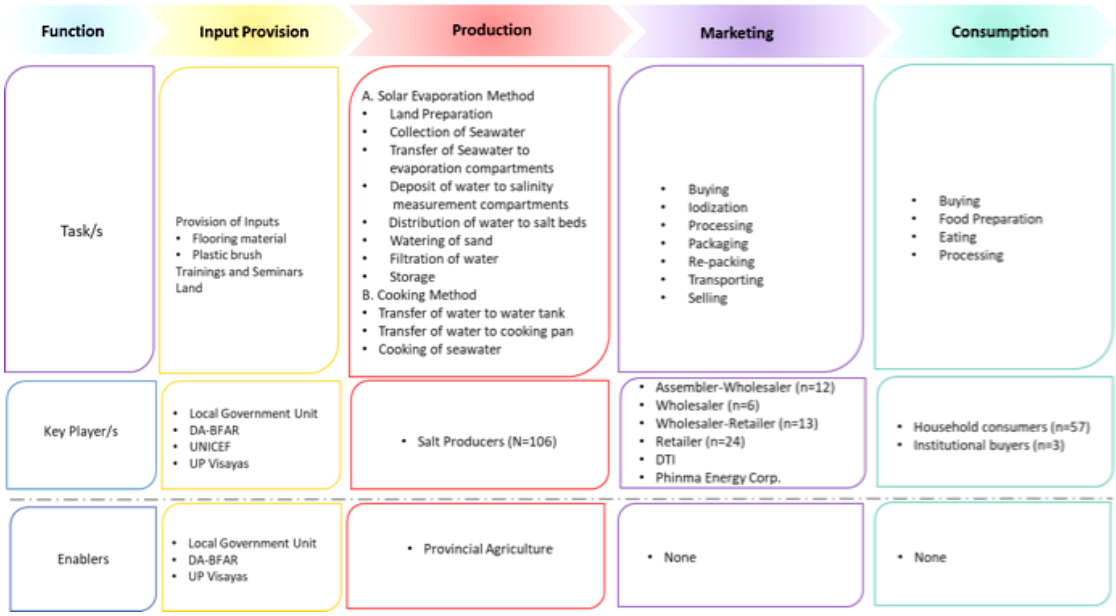

Fig. 1. Salt supply/value chain map, Visayas, Philippines, 201

Table 2. Distribution of socio-demographic characteristics, 22 supply chain participants, Visayas, Philippines, 2018.

Socio-Demographic Characteristics	Type of Supply Chain Participant							Total
	P (n=107)	A-W (n=12)	W (n=5)	W-R (n=14)	R (n=24)	IB (n=3)	HC (n=57)	
	Percent							
Sex								
Male	63	42	60	29	29	33	18	44
Female	37	58	40	71	71	67	82	56
Age (years)								
21-30	5	8	-	7	9	-	14	9
31-40	11	17	20	29	9	33	26	19
41-50	18	25	40	14	24	33	32	27
51-60	23	25	-	43	21	33	14	27
61-70	9	25	20	-	9	-	11	12
71-80	7	-	20	7	-	-	4	6
AVERAGE	51	49	52	50	49	46	45	
Civil Status								
Single	8	8	-	21	25	-	19	14
Married	81	75	60	50	67	100	67	73
Widowed	3	17	40	29	4	-	14	9
Separated	7	-	-	-	4	-	-	4
Educational Attainment								
Elementary Level	16	-	-	-	-	-	2	8
Elementary Graduate	22	8	-	-	17	-	5	14
High School Level	14	8	-	14	13	33	4	11
High School Graduate	28	25	40	36	58	33	33	33
College Level	7	17	20	14	-	33	14	10
College Graduate	5	25	40	21	4	-	35	15
Vocational	7	17	-	14	8	-	7	8
Years of Experience in Salt Business								
1-15	46	67	40	64	75	100	-	54
16-30	37	8	40	14	21	-	-	30
31-45	17	25	-	21	-	-	-	15
46-60	-	-	20	-	4	-	-	1
AVERAGE	20	14	16	15	14	10	0	15

P=producer; A-W=assembler-wholesaler; W=wholesaler; W-R=wholesaler-retailer; R=retailer; IB=institutional buyer; HC=household consumer

End-consumer specification for salt quality. The various salt quality specifications of the 57 end-consumer-respondents in the Western Visayas region are shown in Table 3. The top attributes preferred are the salt's color, texture, and purity. Salt had to be white and without impurities such as small stones. For texture, fine textured was preferred over the coarse ones. Least in the preference attribute ranking is being iodine-fortified despite the fact that the country has already implemented the ASIN law which mandates the addition of iodate in all salts traded and consumed locally.

Table 3. Salt characteristics preferred by 57 end-consumers, Visayas, Philippines, 2018.

Rank	Salt Attributes								
	Color	**Texture**	**Purity** (no dust/small stone)	**Taste** (tinge of bitterness)	**Moisture Content** (dry)	**Iodine-Fortified**	**Packed**	**Branded**	**Modal Attribute**
	Percent								
1	86	5	7	-	-	-	-	2	Color
2	5	26	54	5	2	5	2	-	Purity
3	5	51	18	9	7	5	2	4	Texture
4	-	7	5	12	61	9	2	4	Moisture Content
5	-	7	5	58	14	4	9	4	Taste
6	-	-	11	4	9	18	49	11	Packed
7	-	4	-	7	5	9	18	58	Branded
8	4	-	-	5	2	51	19	19	Iodine-Fortified

The product flow. The product flows show the volume produced, volume bought and sold per season of the key players involved in the salt supply chain from the point of production until the final product reaches the end markets (Fig. 2 & 3). Salt produced in the Philippines can be categorized into three based on quality. Class C salts are those type of salt that are harvested at the early stage of production. It is characterized by a light-brown color attributed to the presence of impurities and is usually priced the lowest among the three salt quality categories. Class B on the other hand, is characterized by off-white crystals and is harvested at the middle stage of salt production. Class A are the whitest crystals formed and are harvested at the peak of salt production when the sun is at its hottest (summer months). On the average, the Visayas Region produces only Class A (664,912.5 kg per season) and Class B salts (705,850 kg per season).

The number of channels for Class A salt varied by season with five during peak months (assembler-wholesalers, wholesalers, wholesaler-retailers, retailers, and institutional buyers) which becomes four during lean months due to the non-participation of wholesalers (Fig.2). For both seasons, the assembler-wholesalers absorb most of the produce. Majority of the Class A salt finds its way to the household consumers (94.62%). On the other hand, the lowest volume sold by the farmers was 60,350 kilograms (9.08%) to the retailers mainly because retailers buy and sell only in small quantities. These retailers are the neighbors of the farmers who own stalls in the public market and used tricycle as their mode of transportation for picking-up their purchased salt. It was also found that farmers do not sell directly to their neighbors for consumption as the latter usually ask for a handful of salt for their daily consumption. A total of 15,275 (2.30%) kilograms of salt produced by the farmers were given away to

their neighbors and relatives. Institutional buyers source salt directly from the farmers during lean months to avail of lower prices.

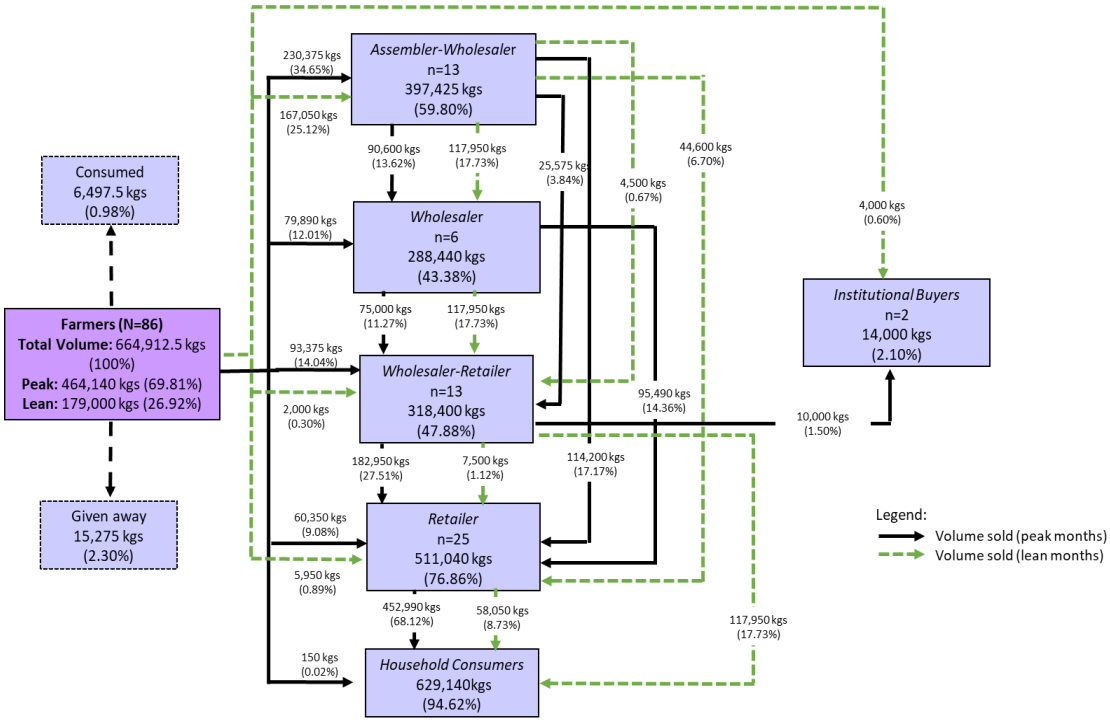

Fig. 2. Product flow of Class A salt, Visayas, Philippines, peak and lean months, 2018

Channel length for Class B salt is relatively shorter and tends to vary with season (Fig. 3). The Class B salt produced in the Visayas passes through five channel levels during peak months (assembler-wholesaler, wholesaler, wholesaler-retailers, retailers, and institutional buyers) but all the produce goes directly only to assembler-wholesalers during lean months. A large chunk of Class B salt produced in the region goes to the wholesalers (35.57%). It should also be noted that among the salt producing areas in the Visayas, only those in Iloilo were able to sell Class B salt to institutional buyers during peak months. This is because Class B salt are also bought and consumed by the household consumers in the region due to insufficient supply of Class A salt.

Based on the narratives of the traders, the seasonal reduction in channel levels is attributed to insufficient Class B salt. Also, the assembler-wholesalers have the capacity to buy in bulk and have established personal relationships with the farmers being their regular buyer or "*suki*" thus they are more preferred as an option. There were no losses reported as the salt moves across the nodes. Volume sold during the lean months are stored inventories which were purposely kept to hedge on seasonal price differences.

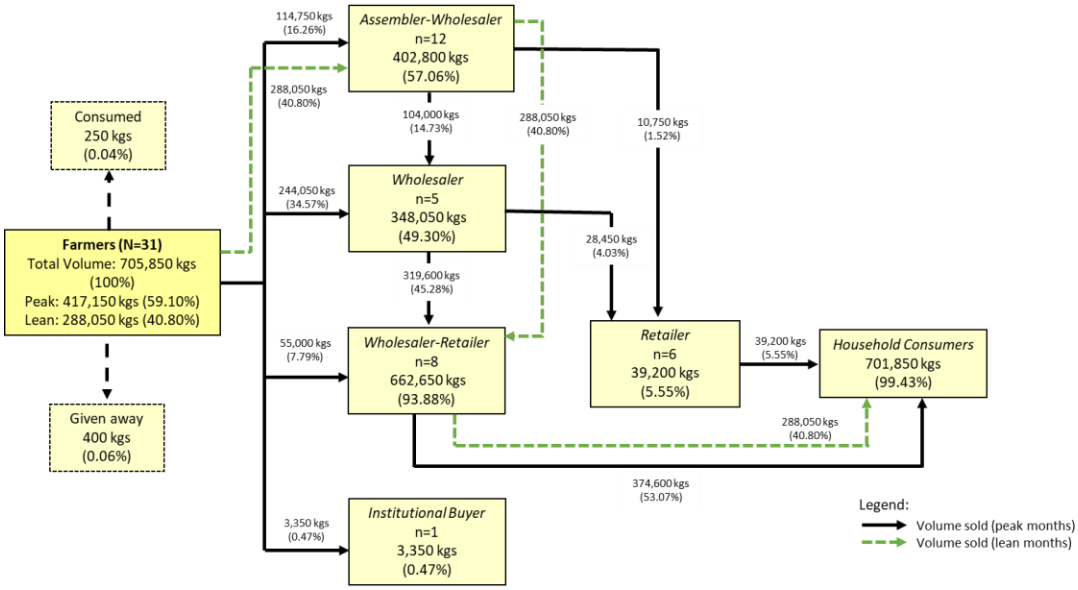

Fig. 3. Product flow of Class B salt, Visayas, Philippines, peak and lean months, 2018.

The geographical flow of salt. The geographical flow of salt shows its trail from the inputs until it reaches the market (Fig. 4). It also reflects the nature of salt being traded, whether it is iodized rock or non-iodized rock salt, and its classification (Class A, Class B, and Class C). Section 2-b of the Philippine Republic Act No. 8172 also known as *An Act Promoting Salt Iodization Nationwide and for Related Purposes* requires all producers/manufacturers of food-grade salt to iodize the salt that they produce, manufacture, import, trade or distribute (FDA-Philippines 1995). Sources and destinations of salt produced and traded are also shown.

It can be noted that salt is consumed where it is produced except in Guimaras which finds its way to Negros Occidental. Majority of salt produced in the Visayas Region is traded as non-iodized. Trading continues to focus more on non-iodized salt as it is more in demand even with the presence of ASIN Law. ASIN Law 'requires the addition of iodine to salt intended for animal or human consumption to eliminate nutrient malnutrition in the country'. As previously cited, the Visayas Region produced and distributed Class A and Class B salt. Of the volume produced in the area, about 11,700 kilograms representing 0.86 percent of the total salt produced and sold within Antique was iodized. The rest (99.14%) was sold as non-iodized. This indicates that there is no strict implementation of ASIN law within Visayas. In other areas, non-compliance to RA 8172 may also explain why the salt produced in major producing provinces are not being traded even to nearby provinces. According to the narratives of some residents (i.e., in Carles, Iloilo), locally produced salt contains enough iodine, and its fortification implies only the addition of synthetic chemicals, hence consumers do not like it.

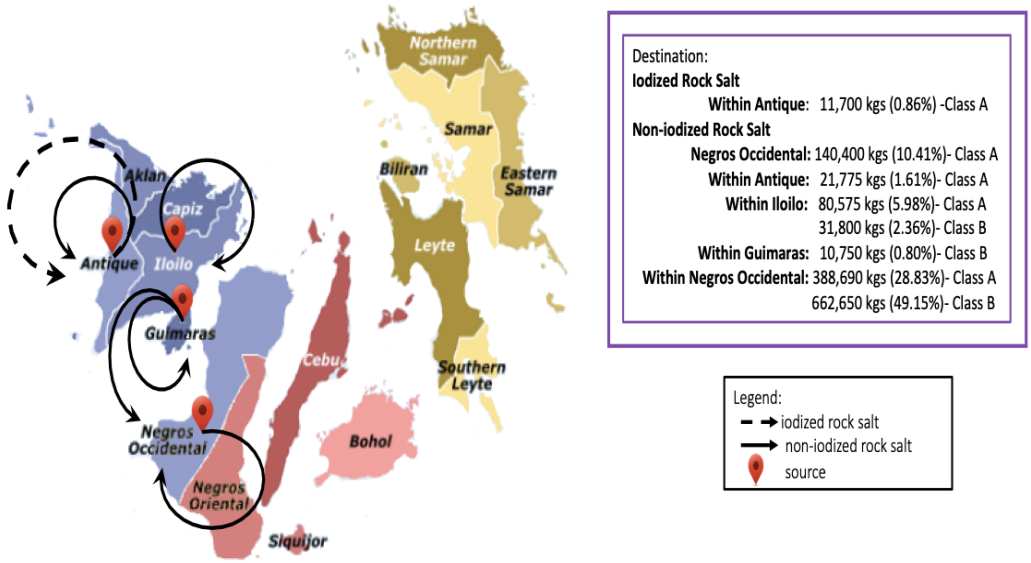

Fig. 4. Geographical flow of salt produced in the Visayas, Philippines, 2018

Value-added at the different levels in the value chain. The costs, prices, marketing margins, marketing costs, nominal profits, and profits expressed as percentage of the marginal costs for each value chain actor during peak and lean seasons for both Class A and Class B salts are presented in Tables 4 to 7. Highest cost is incurred by farmers as they transform the sea water into salt crystals. They were followed by the retailers who bulk-break, package, and sell salt to consumers. Nominal profit per sack is highest among retailers (PhP365.38/sack) across classes of salt and across seasons. Farmer-producers came next with PhP287.14/sack and least profit was generated by assembler-wholesalers (PhP5.47/sack). When profit was expressed as return to cost, the same trend is observed with retailers having the highest profits (1,358.80%) but the least was for wholesalers (101.79%) (Table 4). Producing Class A salt will generally result in a higher profit for the farmer due to the premium price paid for its high quality. Also, profits are generally higher during lean months as salt producers and sellers took advantage of low supply and therefore higher selling price (Table 5).

Consistent with the observation in the case of Class A salt, profit is generally higher during the lean season for Class B salt. Cost of good or production of Class B is lower than that for Class A salt for both production seasons. Nominal profitability was highest among retailers (PhP638.09/sack) during peak season, followed by salt farmers (PhP99.49/sack in the same season) (Table 6). The lean season is characterized by a shorter value delivery network and nominal profitability is highest among wholesale-retailers at PhP647.85/sack and then for farmers at PhP180.96/sack. With the absence of retailers during lean season, marketing profit shifted from the hands of retailers to wholesaler-retailers. Notable also is the close to the 82 percent increase in the profit share of farmers when Class B salt is sold during lean season (from PhP99.46/sack during peak season to PhP180.96/sack during lean season) (Table 7).

Table 4. Price structure of Class A salt (50kgs/sack), selected production areas, Visayas, Philippines, peak months (February-May), 2018.

Parameter	Type of Participant					
	Farmer	**Assembler-wholesaler**	**Wholesaler**	**Wholesaler-retailer**	**Retailers**	**Institutional Buyers**
Buying Price (PhP)		472.29	483.29	494.55	606.67	998.64
Selling Price (PhP)	472.29	483.29	494.55	606.67	98.64	-
Cost of Goods (COG, PhP)	185.15	-	-	-	-	-
Marketing Margin (PhP)	-	10.00	11.26	111.82	392.27	-
Value-Added (PhP)	-	4.53	5.58	23.46	26.89	-
Profit (PhP)	287.14	5.47	5.68	88.36	365.38	-
Profit as % of COG	155.09	-	-	-	-	-
Profit as % of MC		120.75	101.79	376.64	1,358.80	-

Table 5. Price structure of Class A salt (50kgs/sack), selected areas, Visayas, Philippines, lean months (June-November), 2018

Parameter	Type of Participant					
	Farmer	**Assembler-wholesaler**	**Wholesaler**	**Wholesaler-retailer**	**Retailers**	**Institutional Buyers**
Buying price (PhP)		523.76	535.09	545.17	620.02	1,000.00
Selling price (PhP)	523.76	535.09	545.17	620.02	1,000.00	-
Cost of Goods (COG, PhP)	192.56	-	-	-	-	-
Marketing margin (PhP)	-	11.42	10.08	74.85	379.98	-
Value-Added (PhP)	-	5.16	4.41	15.34	30.14	-
Profit (PhP)	351.11	6.26	5.67	59.51	349.84	-
Profit as % of COG	171.95	-	-	-	-	-
Profit as % of MC	-	121.31	128.52	387.94	1,160.72	-

Table 6. Price structure of Class B salt (50kgs/sack), selected areas, Visayas, Philippines, peak months (February-May), 2018.

Parameter	Type of Participant					
	Farmer	**Assembler-wholesaler**	**Wholesaler**	**Wholesaler-retailer**	**Retailers**	**Institutional Buyers**
Buying price (PhP)		195.83	207.30	216.00	330.51	998.64
Selling price (PhP)	198.53	207.30	216.00	330.51	998.64	-
Cost of Goods (COG, PhP)	96.34	-	-	-	-	-
Marketing margin (PhP)	-	11.47	8.70	114.51	668.13	-
Value-Added (PhP)	-	4.71	4.21	24.17	30.04	-
Profit (PhP)	99.49	6.76	4.49	90.34	638.09	-
Profit as % of COG	103.26	-	-	-	-	-
Profit as % of MC	-	143.52	106.56	373.76	2,124.13	-

Table 7. Price structure of Class B salt (50kgs/sack), selected areas, lean months (June-November), Visayas, Philippines, 2018

Parameters	Type of Participant			
	Farmer	**Assembler-Wholesaler**	**Wholesaler-Retailer**	**Institutional Buyers**
Buying Price (PhP)		261.00	280.00	950.00
Selling Price (PhP)	261.00	280.00	950.00	-
Cost of Goods (COG, PhP)	80.04	-	-	-
Marketing Margin (PhP)	-	19.00	670.00	-
Value-Added (PhP)	-	6.56	22.15	-
Profit (PhP)	180.96	12.44	647.85	-
Profit as % of COG	226.08	-	-	-
Profit as % of MC	-	189.63	2,924.83	-

Relationships and linkages among the value chain actors. Horizontal relationship pertains to relationship existing among participants in the same node of the value chain (e.g., among salt producers). Vertical relationship on the other hand pertains to relationship existing between participants in the different nodes of the chain (e.g., between salt producers and traders).

Of the five parameters under horizontal relationship, salt farmers exhibited strong relationships with co-farmers along the areas of information sharing, collaboration to sell in bulk, and trust (Table 8). Farmers demonstrated a weaker relationship among their peers along the areas of competition level and benefits from collective initiative. In contrast, traders demonstrated a strong relationship with peers across all horizontal relationship parameters except collaboration to sell in bulk. This is because each trader has his/her own set of buyers who have different schedules of delivery requests depending on convenience. Moreover, traders emphasized that they do not ask who the buyer of the other traders are to prevent vying for customers.

The degree of vertical relationship across the different players was found to be strong for verbal agreement. All transactions made across the salt value chain are done verbally. There is no written contract or agreement that market participants along the chain must comply with when trading salt. As long as salt producers can produce salt regardless of the demand of their buyers, traders will still buy these because they practice the "*suki system"* and because quantity demanded is always higher than quantity supplied. *"Suki system"* is a business relationship existing in the Philippines which happens when the buyer and seller informally commits to become each other's regular customer and supplier. This system fosters trust among the market participants. With the exclusion of input providers to farmers, a strong relationship across all members of the salt value chain was noted along the areas of information sharing on prices and quality control. Weak relationship across all value chain participants was noted along the areas of written contracts and sharing of quantity and technology.

Constraints mapping. The salt industry participants in the Visayas Region face several constraints at the different value chain levels and these are categorized based on the following segments: procurement of input assembly; selling of output; finance; training/seminar; market information; and technology. It is apparent that constraints are localized in a specific sector except in finance which happens to be a problem for all value chain participants (Table 9).

For the farmers, the main constraint is the high cost of flooring materials and the implements needed to heap and consolidate the salt crystals. There are two types of flooring materials that are being used - bricks, and clear plastics. Plastic liners can be used for the whole season and if one is careful enough its useful life can be extended up to two seasons or two years. Not many farmers though can afford the cost of required flooring materials preventing them from expanding and/or venturing into the salt making business without assistance from the government.

The problem of the traders on the lack of salt supply is the result of the farmers not having enough volume to supply them especially during the wet season when there is no production at all. This goes to show that if the farmers can supply more, then this problem of the traders will be addressed also. On the other hand, the problem on lack of markets for some farmers is due to non-iodization. Non-iodized salts are not permitted to be brought out of the municipality hence the available markets are only those within the area and yet the traders are experiencing a lack of supply for transporting to outside markets.

While purity is one of the top attributes sought for by the end-consumers, salt currently being produced is characterized by the presence of impurities thus posing a problem. Impurities come from being exposed to the open air environment where wind brings with it dust and other unwanted particles.

Table 8. Horizontal and vertical relationships among the identified key players in the salt value chain, Visayas, Philippines, 2018.

Parameter	Horizontal Relationship		Vertical Relationship				
	Farmer to Farmer	**Traders to Traders**	**Input Provider to Farmer**	**Farmer to Assembler-Wholesaler/ *Viajero***	**Assembler-Wholesaler / *Viajero* to Wholesaler**	**Wholesaler to Wholesaler-Retailer**	**Wholesaler-Retailer to Retailer**
Horizontal Relationship							
Information sharing							
Prices of salt	Strong	Strong					
Problems	Strong	Strong					
Practices	Strong	Strong					
Collaboration to sell in bulk	Strong	Weak					
Competition level							
Prices	Weak	Strong					
Buyers	Weak	Strong					
Practices	Weak	Strong					
Trust							
Management	Strong	Strong					
Selling	Strong	Strong					
Benefits from collective initiative	Weak	Strong					
Vertical Relationship							
Procurement or supply							
Written contract			Weak	Weak	Weak	Weak	Weak
Verbal agreement			Strong	Strong	Strong	Strong	Strong
Information sharing on technology and prices							
Price			Weak	Strong	Strong	Strong	Strong
Quantity			Weak	Weak	Weak	Weak	Weak
Technology			Weak	Weak	Weak	Weak	Weak
Quality control							
Texture			Weak	Strong	Strong	Strong	Strong
Color			Weak	Strong	Strong	Strong	Strong
Cleanliness			Weak	Strong	Strong	Strong	Strong
Presence of value-added services			Weak	Strong	Strong	Strong	Strong

Table 9. Problems encountered by the identified key players in the salt value chain, Visayas, 2018.

Segment	Farmers		Traders		End Consumers	
	Constraints	Opportunities	Constraints	Opportunities	Constraints	Opportunities
Procurement of Flooring Materials and Implements	High Cost	Availability of low-cost flooring materials and implements will encourage more farmers to venture in salt production	Lack of salt supply	There is unmet demand for salt in the market, for farmers to fulfill.	-	-
Selling of Output	Limited choice of market	There are many markets that can still be tapped if only there will be concerted effort to link with them.	Low selling price of salt	Decreased salt importation and storage during peak production months can help stabilize local salt price.	-	-
Finance	Lack of capital	There are existing laws that mandate the provision of low-interest capital for the farmers can take advantage of (e.g., Agri-Agra Law, etc.)	Lack of capital	Presence of local banks and/or microfinance institutions for the provision of low-interest loans for increased capital.	-	-
Training/Seminar	None	-	None	-	-	-
Market Information	None	-	None	-	-	-
Technology	None	-	None	-	-	-
When Buying	-	-	-	-	Presence of impurities	Best practices in Class A salt production can be popularized and upscaled for its increased availability.
During Consumption/Use	-	-	-	-	Rock salt is hard to dissolve	There is existing technology that produces refined salt for consumers who desire to use easily dissolved salt.

CONCLUSIONS AND RECOMMENDATIONS

It can be concluded that the farmers remain the dominant actor in the salt value chain suggesting that any improvement at their level resonates in the whole value chain emphasizing the need to address the concern of the farmers for enhanced production. The solar evaporation of seawater as the common method of salt production results to its seasonal availability which is aggravated by the lack of appropriate salt storage facilities. Also, while producing Class A salt is more profitable for farmers during peak months, Class B was the more profitable during lean months. Among all the value chain participants, the retailers gained the highest profit relative to their marketing costs during peak and lean months and for both Class A and B, although they were not among the market participants for Class B salt during the lean months. In terms of governance, there is strong horizontal relationships among chain participants, but farmers had a weaker relationship with their peers along the areas of price determination, seeking buyers, and knowledge on new technologies as they tend to compete with each other, limiting their ability to benefit from collective initiative. Non-adherence to ASIN Law hampers the movement of salt to the target markets that are located beyond municipal boundaries.

While producing Class B salt was found more profitable for the farmers during lean months, it should be highly encouraged that during peak months, they upgrade to producing Class A salt because it is more profitable. Makeshift and simple seawater filtration process during production, as done in other areas of the country can help address this. To deal with the seasonal availability of salt which is the result of the seasonal nature of production, it is recommended that the farmers form an association that would facilitate bulk buying of the material inputs. On top of this, the association could set up a "farmer's piggy bank" or sustainability fund where they will be required to set aside a certain portion of their income as savings in preparation for the next season's purchase of flooring material which at the least is every two seasons or two years. In this way, they will not be dependent on non-assured dole-outs from the government and other donors. In line with this, financial literacy along with simple profitability analysis training should be provided to the producers. This should, eventually help address the problem of lack of supply of salt resulting from the expanded production areas. Also, with profitability per sack both for nominal and as percentage of marketing cost being highest downstream of the value chain (i.e., among retailers), farmers as a formed association can venture into retailing. Forming an association has an added advantage due to the possibility of farmer-members enjoying increased bargaining power for higher prices, enhanced market niching, and improved access to capital resulting from reduced transaction/loans processing cost. Improved access to capital is critical because across the salt value chain, financial constraint is the main limiting concern. This should promote economic sustainability and continuous and expanded salt farming operations. Once this is assured, setting up of storage facilities in optimal areas could assure the availability of salt even during the wet season. In the short- and in the mid-term, the local government units should be able to provide these and for maintenance and upkeep charge a minimal fee per unit of stored salt. In the long-term, there is a need to scout for salt production technologies that are suitable in the local setting and yet not wholly dependent on sunlight, availability of which is becoming highly unpredictable due to climate change. Benchmarking with other salt-producing countries would help a lot in this endeavor.

In addition, since some of the reasons for lack of salt market among producers and inadequacy of salt supply among traders are some provisions mentioned in the ASIN Law (An Act Promoting Salt Iodization Nationwide and for Related Purposes), it is recommended that this law be revisited. In particular, it should be reviewed in the light of present developments (e.g., marketing, etc.) in the salt industry and the environment where salt is being produced.

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