

**THE SALT INDUSTRY
IN PANGASINAN, BULACAN AND OCCIDENTAL
MINDORO***

A Final Report

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EXECUTIVE SUMMARY

The survey on the status of the salt industry covered the three provinces of Pangasinan, Bulacan and Occidental Mindoro. A total of 115 producers were interviewed, of whom, 24 (20.87%) were in Pangasinan including 4 out of 6 big producers in the three areas. In Bulacan, 39 (33.91%) were interviewed, majority of whom were medium-sized producers. The rest, 52 (45.22%), salt producers, were in Occidental Mindoro.

Total salt production of the 115 salt producers in the three areas amounted to 184,186 metric tons (MT). Of this amount 154,186 MT (83.71%) were produced for human consumption, which is 72.2% of the estimated 213,571.4 MT total salt consumption of the country's population.

Bulacan salt producers contributed 71,419 MT (38.78%) of the total salt produced. These were produced by 32 medium-sized, and one big, salt producers. In Pangasinan, 74,765 MT (40.59%) was produced which four big producers largely contributed. The remaining 38,002 MT (20.63%) were produced in Occidental Mindoro by 44 small, and one big, salt producers.

Salt production by big producers in the three provinces totaled 74,715 MT intended for human consumption and 30,000 MT for industrial use. The medium producers contributed 90,377 MT, while the small producers, 19,094 MT.

The salt produced in Pangasinan went largely to Bulacan (33.33%), to Bicol (29.17%) and other parts of Luzon. Most of the salt from Bulacan went to Malabon, Metro Manila area (94.87%) and the rest to other parts of Luzon. The salt produced in Occidental Mindoro was brought to Marinduque and other parts of Visayas and Mindanao.

The method of salt production was mainly by solar evaporation along the coastal areas with production period during the dry season between December to May. The most common size of salt bed was 18"x 20". All the salt producers interviewed produce coarse salt although fine salt was produced at village level in some areas in Pangasinan. Only 65.22% of the producers had warehouses to store their harvest. The rest kept their salt near the production area to be picked up on site by buyers or agents. The salt products were packaged in new high-density polyethylene bags (82.61%) or used woven polypropylene (21.74%) bags. The products were then transported to different areas by truck (40.00%), "casco" (31.30%) and other land transport vehicles (e.g. jeepneys and buses).

The survey also revealed that 65.22% of the producers had only 1 to 3 buyers while 25.22% had 4 to 6 buyers. Further, these buyers or agents sold to dealers who stored the commodity in warehouses for wholesale distribution to subdealers. The subdealers would then sell to owners of sari-sari stores and groceries. At this level, salt was re-packed into 1-kg bags or in some cases re-packed on market site if sold "chupas" to household consumers.

The price of a 50 kilo-bag of salt as of December 1993 ranged from P40.00 to P70.00 per package in the 3 areas. Thus, the average price may be P1.00 at farm gate per kilo of salt. However as the salt moves from the producers to the consumers, prices are likely to increase.

The country imported 22 MT of table salt in 1993, a marked reduction from 1,151 MT in 1989. Likewise, the industrial salt importation dropped to 66,272 MT. in 1993 from 207,281 MT in 1989. It was not known how much of the table salt was iodized.

Based on the results of this survey, it is recommended that the Department of Health (DOH) shall organize a salt databank unit at the Nutrition Service to collect and analyze information gathered from salt producers in the different areas. An annual statistical report incorporating all these data shall be prepared for utilization in policy and program concerns of government and non-government organizations.

It is also recommended that the Local Government Units identify and require the salt producers to register in their respective pertinent local government offices as salt producers and provide information on their name, address and annual production.

Furthermore, it is recommended that the DOH shall invite big salt dealers and advocate for their roles in the entire salt iodization program. In addition, the dealers shall provide information on: the amount of salt bought from the salt producers, how much is earmarked for human and livestock consumption and industrial use, where salt is distributed and in what form and what process (i.e. purification) the salt undergoes before distribution.

In order to get a comprehensive picture of the salt industry in the country and to facilitate the development and formulation of a National Program for Salt Iodization, it is recommended that a survey not only of salt producers but also among dealers/traders, retailers and a sample of households be conducted in the other salt producing areas of Luzon, Visayas and Mindanao.

ACKNOWLEDGEMENTS

The Nutrition Center of the Philippines (NCP) expresses its appreciation to the Department of Health (DOH) for the laudable initiative in commissioning NCP to undertake the first large survey of salt producers in the country.

Likewise, the NCP feels privileged to work in partnership with the DOH towards achieving the common goal of eradicating iodine deficiency in the country.

We deeply appreciate the funding support of UNICEF for this project.

We wish to thank the officers of the Salt Producers Association of the Philippines who provided valuable suggestions and information on the salt industry.

We appreciate the cooperation of the Department of Trade and Industry (DTI), Bureau of Mines (BOM), Board of Investments (BOI), National Statistics Office (NSO), Central Bank of the Philippines and the Department of Science and Technology (DOST) in providing information about salt and the salt industry.

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I. INTRODUCTION

A. Iodine Deficiency Problem in the Philippines

Iodine deficiency disorders (IDD) continues to be one of the major nutritional problems in the country today. IDD, which refers to a group of clinical entities caused by inadequacy of dietary iodine, includes goiter, hyperthyroidism, cretinism, fetal wastage and increased morbidity and mortality.

Based on the 1987 Department of Health - Department of Education, Culture and Sports (DOH-DECS) survey among schoolchildren, it has been estimated that about one third of Filipinos live in iodine-deficient areas where they are prone to develop and suffer from any of the consequences of iodine deficiency ⁽¹⁾.

A nationwide survey by the Food and Nutrition Research Institute (FNRI) in 1987 ⁽²⁾ showed that goiter prevalence among female members of the population was high. Most affected were the pregnant and lactating women, of whom more than 10 in every 100 had goiter.

In an effort towards the virtual elimination of this problem, the government is pursuing activities along three major strategies, namely: supplementation of individuals at risk with iodine preparations, salt iodization and nutrition promotion and advocacy for consumption of iodized salt and iodine-rich foods.

B. Rationale for the Study

Fortification of salt with iodine is viewed as the long-term approach to eliminate IDD and its consequences. The technology for salt iodization is feasible, relatively simple, well-known, cheap, safe, rapidly effective and widely acceptable ⁽³⁾, as perceived in some countries in Asia, where the largest global concentration of population affected by IDD is located. Intensification of salt fortification and iodized oil distribution, training and education have produced improvements in Indonesia, Bhutan, Nepal and Thailand. However, in order to properly develop and implement a program for nationwide iodization of salt, we need to have sufficient information on the salt industry, salt production and distribution and consumption patterns in the country.

In existing literature on the salt industry, and feasibility studies of iodization programs ^(4, 5, 6), discrepancies have been noted in estimates of salt production. For example, estimates in Mannar's report differ from those of the Bureau of Mines (BOM). The Department of Agriculture (DA) study was also based on the estimates of the BOM and other sources. However, none of them have attempted a large survey of salt producers.

Recognizing the need to gather sufficient information on the salt industry, the Nutrition Service of the Department of Health (DOH) in collaboration with UNICEF has commissioned the Nutrition Center of the Philippines (NCP) to undertake such activity.

The information collected will be used in identifying specifications of iodization machines and possible locations for the establishment of iodization plants. This information will also be used for planning other support activities that the salt industry needs to be able to effectively contribute to the goal of eliminating IDD; including revitalization of the salt industry and upgrading salt production technology, organization of cooperatives, promotions and campaigns to create demand, monitoring and evaluation, and researches.

II. OBJECTIVES

The general objective of the survey is to gather detailed information on the salt industry in the Philippines.

Specifically, it aims to:

1. gather information about salt producers/manufacturers and principal salt dealers and their locations,
2. determine the annual production and the production capacities of salt producers,
3. determine the quantity of salt sold for human and industrial consumption and other uses,
4. describe the marketing and distribution network,
5. determine the prevailing market price of salt at different levels of the distribution network,
6. gather information about the importation of salt: the amount, type and prevailing prices of imported salt.

III. DESIGN OF THE STUDY

A. Time and Place of the Study

The study was conducted in three provinces of Luzon, namely: Pangasinan (Figure 1), Bulacan (Figure 2) and Occidental Mindoro (Figure 3), located in the northern, central and southern parts of Luzon respectively (Figure 4). These areas were chosen mainly because of numerous salt producers known to be operating in these areas.

Data collection was conducted from October 26 to December 04, 1993.

B. Respondents

The respondents for the study were the salt producers operating in Pangasinan, Bulacan and Occidental Mindoro who were willing to be interviewed.

PROVINCE OF PANGASINAN

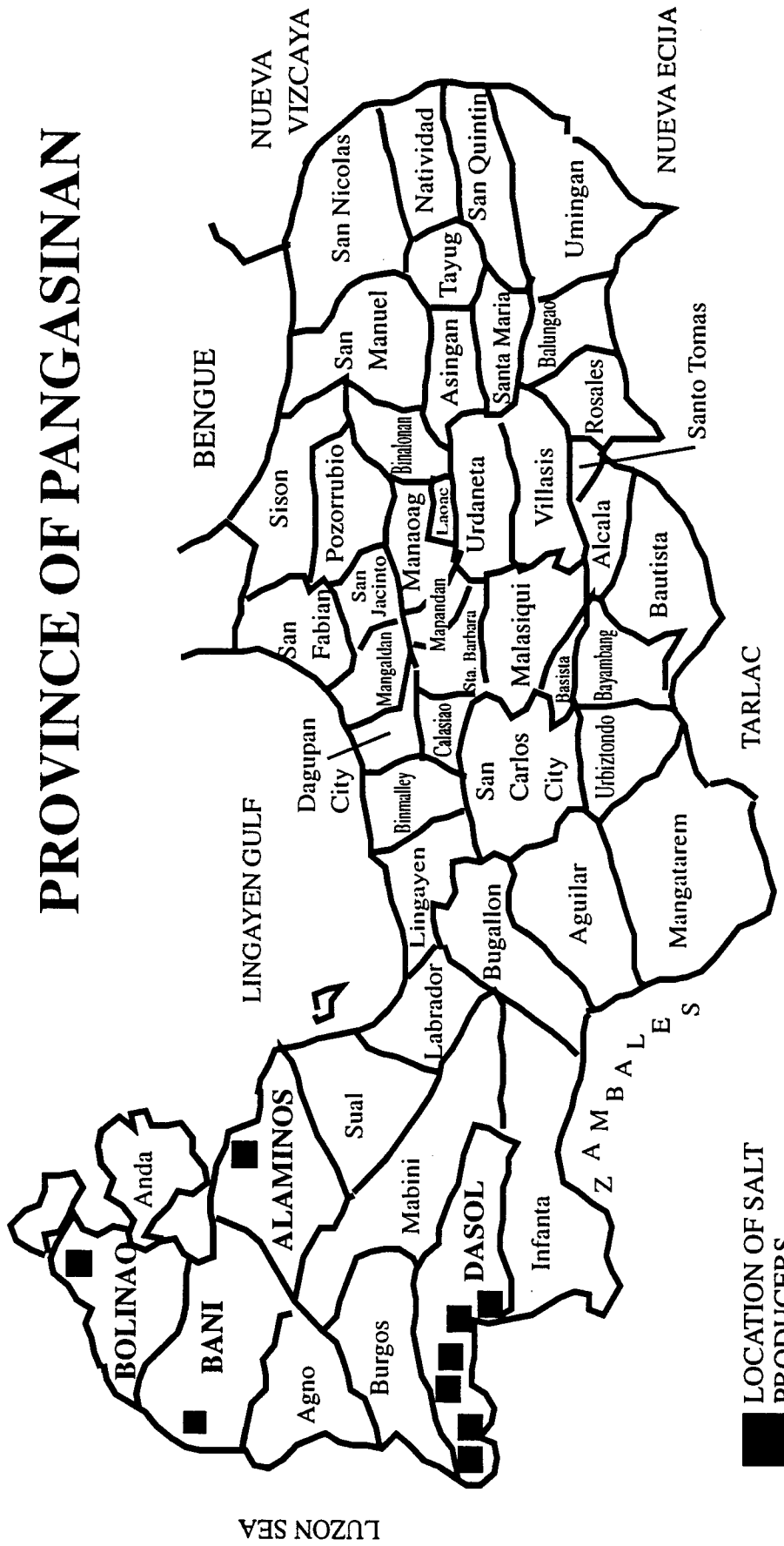


Figure 1. Map of Pangasinan Indicating the Location of Salt Producers Interviewed

PROVINCE OF BULACAN

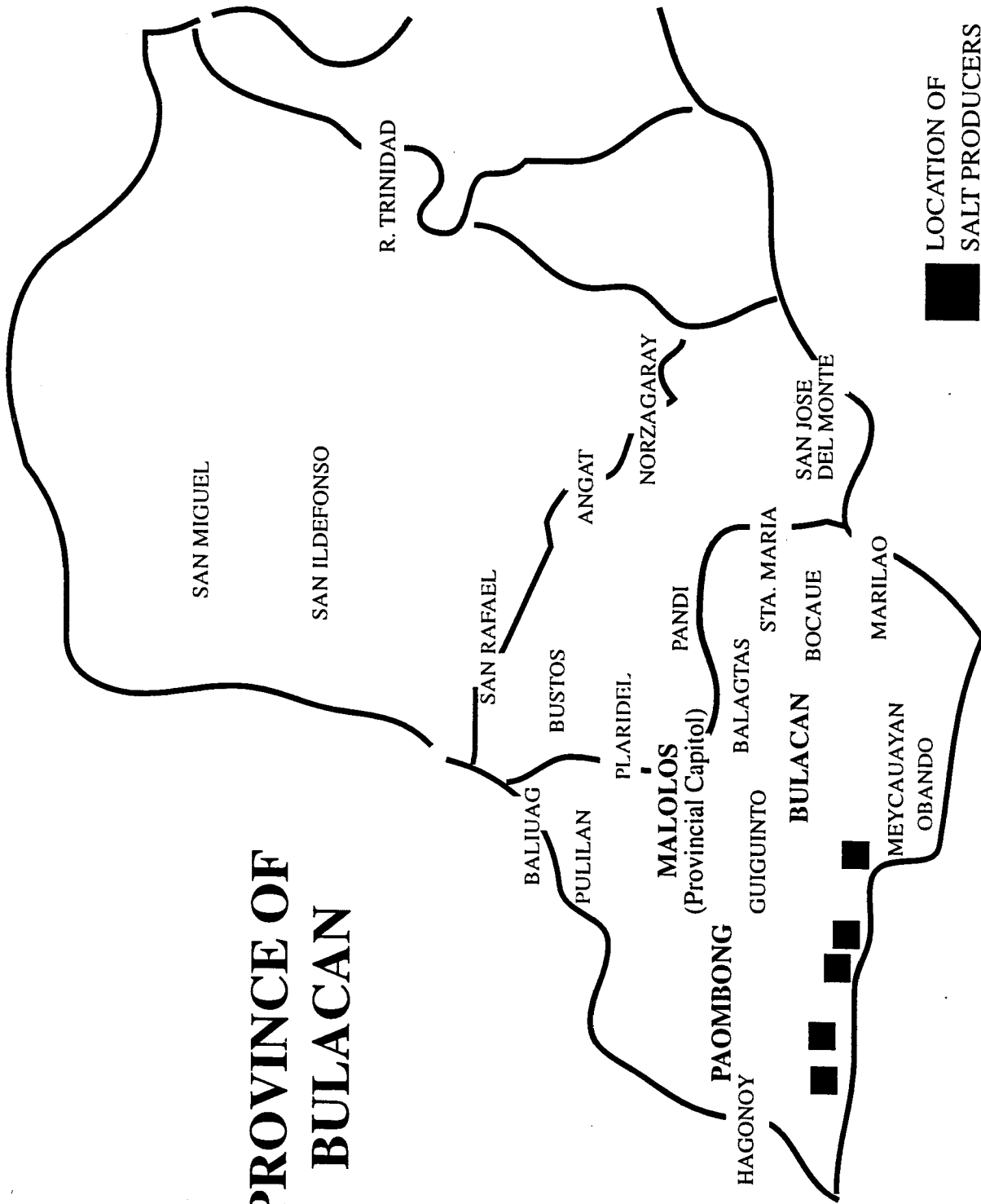


Figure 2. Map of Bulacan Indicating the Location of Salt Producers Interviewed

PROVINCE OF OCCIDENTAL MINDORO

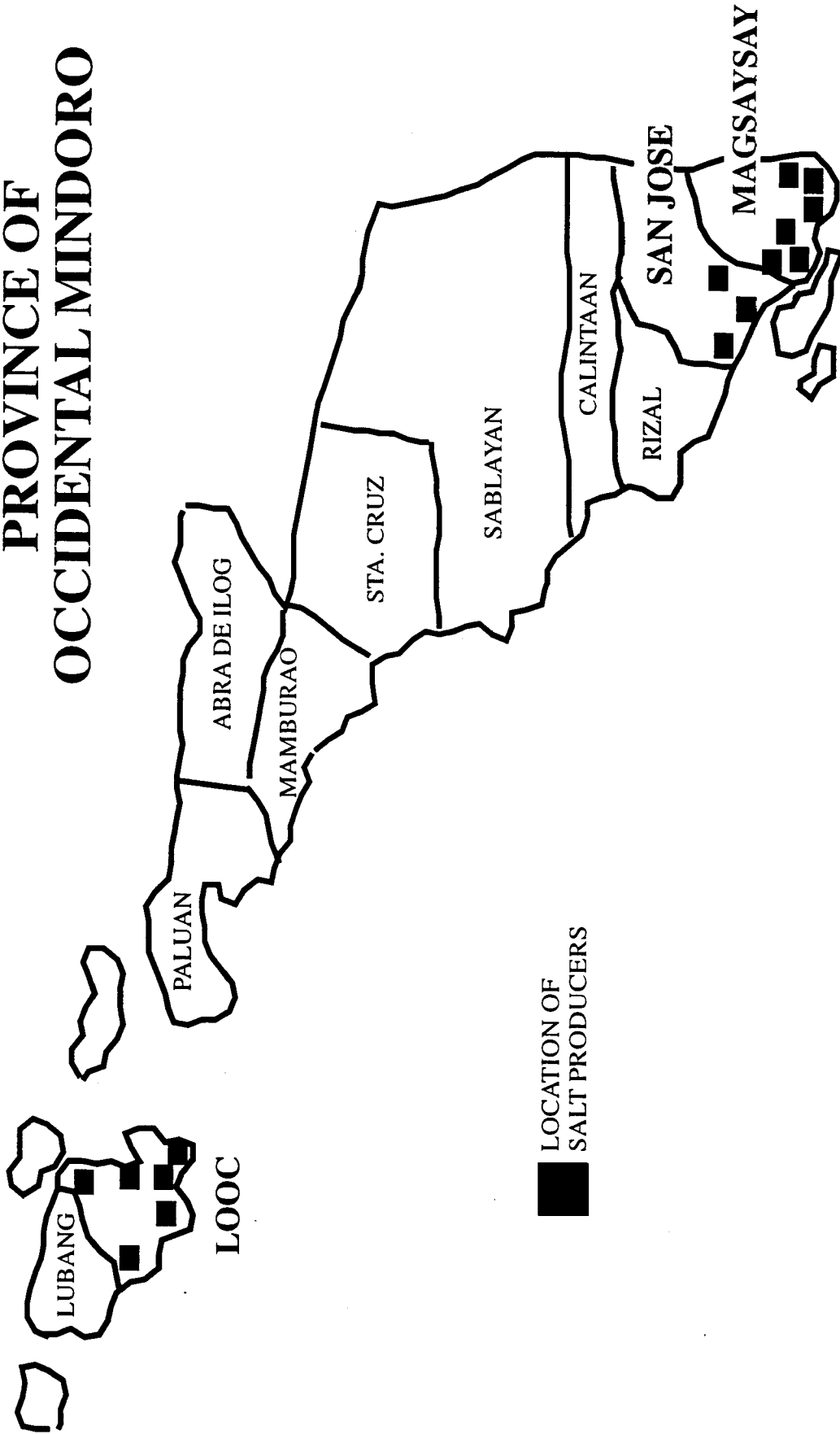


Figure 3. Map of Occidental Mindoro Indicating the Location of Salt Producers Interviewed

Legend:

 PANGASINAN

 BULACAN

 OCCIDENTAL MINDORO

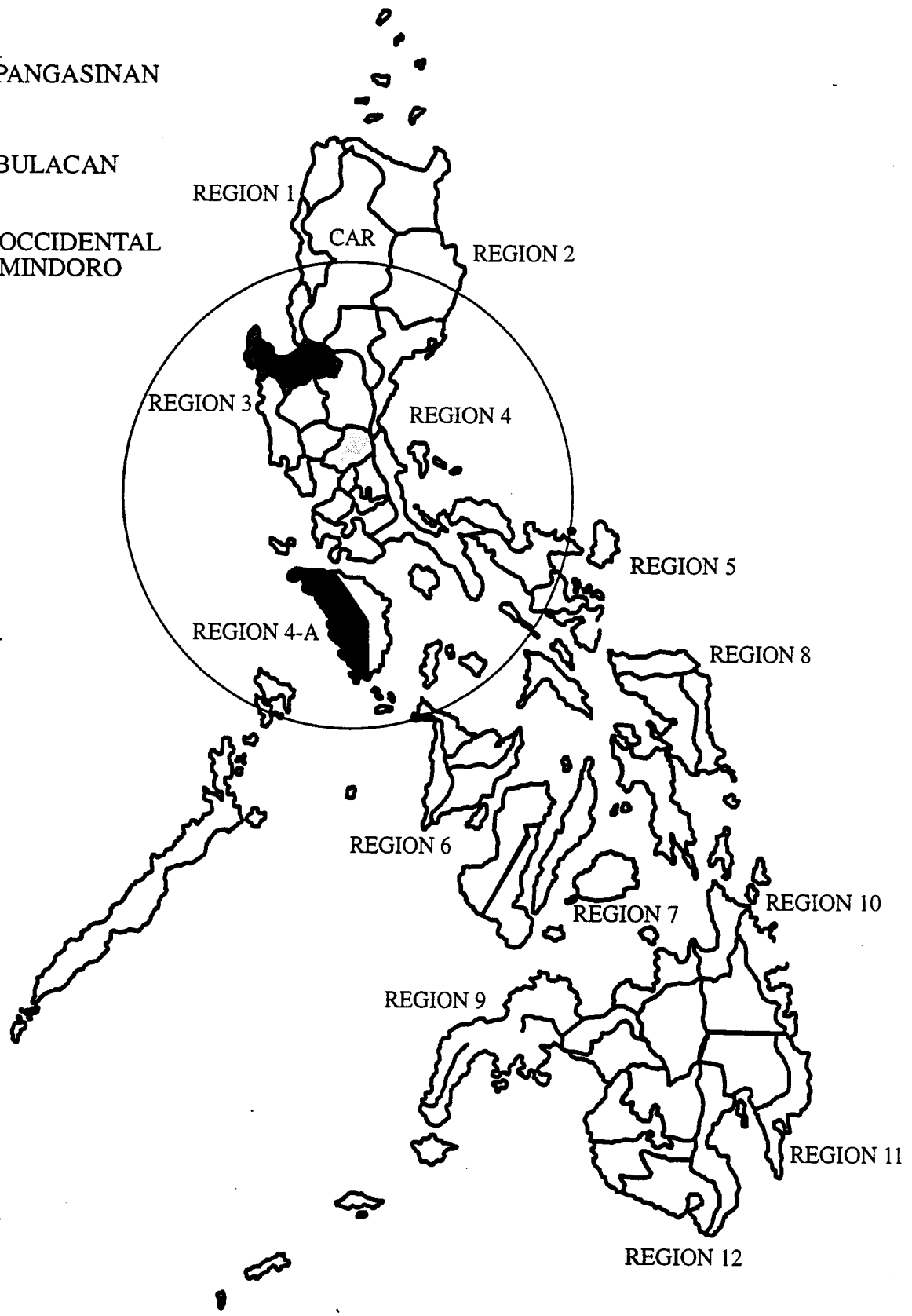


Figure 4. Map of the Philippines Indicating the Location of Survey Areas

C. Number of Respondents

Out of the 127 salt producers which were obtained from the inventory of the Department of Science and Technology (DOST) in the 3 provinces only 43 (33.86%) were interviewed. However, there were 72 (62.61%) out of 115 salt producers who were not in the list but were interviewed. On the other hand, of the 10 salt dealers identified, only one responded. The other salt dealers were visited for the interview but did not give the information requested of them.

III. METHODOLOGY

The study has several phases: the preparatory phase, the data collection and the data processing and analysis.

A. Preparatory Phase

1. Social Preparation

The Principal Investigator met and coordinated with officials of the Nutrition Service - Department of Health (DOH) regarding tools and procedures for data collection. Conferences with the President and the Secretary of the Salt Producers Association of the Philippines (SPAP) were also held to obtain initial information about the salt industry and directory of salt producers. Likewise, letters were sent and visits were made to different institutions such as the Department of Trade and Industry (DTI), BOM, Board of Investments (BOI), DOH, National Statistics Office (NSO) and the DOST to gather similar data. Unfortunately, not all of these institutions were able to provide the needed information.

2. Identification of Salt Producers

A masterlist of salt producers was prepared on the basis of information gathered from the DOST and the SPAP. The Provincial and Municipal Health Officers were visited but were not able to pinpoint the possible locations of the salt producers in their areas. The salt producers were located through visits to the Barangay Captains and interviews with the local residents. During these visits it was known that the salt producers were registered as fishpond owners hence the difficulty in identifying and locating them.

B. Data Collection

Selected salt producers in the three provinces were interviewed to generate information on the salt industry e.g. production site, annual production and production capacities, quantity of salt sold for human and industrial uses, marketing and distribution practices, and prevailing market prices of salt.

A Field Interviewer was recruited and trained on the accomplishment of the survey forms. Different survey forms were used for collecting data from salt producers, dealers and importers. These forms were pre-tested by the Field Interviewer in Noveleta, Cavite.

To facilitate the interview, letters from Dr. Carmencita Reodica, Assistant Secretary of the DOH and Dr. Florentino S. Solon, Executive Director of NCP were given to the respondents seeking assistance in gathering information about the salt industry. Salt producers were assured that the data generated would be treated with utmost confidentiality.

Questionnaires were likewise sent by mail and special courier to the different salt dealers and salt importers in Manila, who were also visited and followed up through telephone by the Project Coordinator. However, only one salt dealer responded while the salt importers were hesitant in providing information. At any rate, the Project Coordinator visited agencies such as the BOM, the DTI and the Central Bank of the Philippines to gather information on salt importation particularly on the amount, type and prevailing market prices of imported salt.

C. Data Processing and Analysis

All data generated by the study were processed at the NCP. An information system for the collection, storage, retrieval and analysis of the data was designed and developed.

The data obtained from this study were processed in IBM PC/AT and IBM RISC 6000 computers and were analyzed using the Statistical Analysis System (SAS) software package.

IV. RESULTS AND DISCUSSION

A. Distribution of Salt Producers Interviewed

The 115 salt producers interviewed included, 52 (45.22%) in Occidental Mindoro, 24 (20.87%) in Pangasinan and the rest or 33.91% in Bulacan (Table 1).

Table 1. Frequency and Percent Distribution of Salt Producers Interviewed by Area

AREA	NO.	%
Pangasinan	24	20.87
Bulacan	39	33.91
Occ. Mindoro	52	45.22
TOTAL	115	100.00

B. Salt Production Process

There are three methods of producing salt: the "solar" process, the "grainer" process and the "vacuum procedure" all of which are designed to remove water from sea water or brine.

In the solar process, water removal is effected by the action of the sun; in the grainer process, by direct heat, and in the vacuum procedure, by first heating the brine with chemicals to free it from impurities such as magnesium chloride and calcium sulphate. Then artificial evaporation is done by the use of live steam. In Pangasinan, cooking of pure brine from the sea is being done prior to the solar drying process.

Solar drying is the most common method being used by the salt producers interviewed, which is also adopted by most of the salt producers nationwide.

Daily salt production is observed during the salt harvesting season occurring during the dry months of December to May. Salt production is weather dependent and limited in coastal areas.

C. Type of Salt Produced

Two types of salt are being produced in the areas surveyed: coarse and fine. In some instances, fine salt is being processed from the coarse salt after harvest or by cooking pure brine. Coarse salt measures about 1-2 mm whereas fine salt appears as crystal-like sugar.

All of the salt producers manufacture coarse salt. However, there are two (1.74%) salt producers from Pangasinan who produce fine salt aside from coarse salt (Table 2).

It has been reported in an earlier study ⁽⁴⁾ that fine salt is processed at village level in small quantities not to exceed 1.5 to 2.0 metric tons near the production center. No recent information is available as to where fine salt is produced, its quantity and the population density it supplies.

Table 2. Frequency and Percent Distribution of Salt Producers by Type of Salt Produced and Area

TYPE*	PANGASINAN (n=24)		BULACAN (n=39)		OCC. MINDORO (n=52)		TOTAL (n= 115)	
	No.	%	No.	%	No.	%	No.	%
Coarse	24	100.00	39	100.00	52	100.00	115	100.00
Fine	2	8.33	0	0.00	0	0.00	2	1.74

* Multiple responses

D. Classification of Salt Producers

The salt producers were classified into small, medium and big scale, depending on the number of their salt beds. A small scale producer has less than 200 salt beds; the medium scale producer, 200 to 999 salt beds, and; the big scale producer, 1000 or more salt beds. There are 67 small-scale salt producers in the 3 provinces and 42 medium scale producers and only 6 big producers (Table 3). Four (66.67%) of the big producers are in Pangasinan while Bulacan and Mindoro have one each. Majority of the medium producers (76.19%) is in Bulacan and many small producers are in Mindoro (65.67%) and Pangasinan (25.37%).

Table 3. Frequency and Percent Distribution of Salt Producers by Area and Classification

AREA	SMALL (<200)		MED. (200-999)		BIG (> 1000)	
	No.	%	No.	%	No.	%
Pangasinan	17	25.37	3	7.14	4	66.67
Bulacan	6	8.96	32	76.19	1	16.67
Occ. Mindoro	44	65.67	7	16.67	1	16.67
TOTAL	67	100.00	42	100.00	6	100.00

E. Categories of Salt Beds

There are various sizes of salt beds by area. The most common in Pangasinan is 18' X 22'. In Bulacan, majority (29 or 74.36%) of the salt beds measures 18' X 20', while in Occidental Mindoro more than half of the salt beds available (31 or 59.62%) measure 14' X 28' (Table 4). A bed with a size 18' x 20' may yield approximately 1.5 cavans/day (estimated 50 kilos/cavan).

Table 4. Frequency and Percent Distribution of Salt Producers by Size of Salt Beds and Area

SIZE OF SALT BEDS	PANGASINAN		BULACAN		OCC. MINDORO		TOTAL	
	No.	%	No.	%	No.	%	No.	%
16' x 18'	5	20.83	1	2.56	-	-	6	5.22
18 x 20'	6	25.00	29	74.36	8	15.38	43	37.39
18' x 22'	13	54.17	8	20.51	6	11.54	27	23.48
18' x 24'	-	-	1	2.56	-	-	1	0.87
14' x 28'	-	-	-	-	31	59.62	31	26.96
20' x 20'	-	-	-	-	7	13.46	7	6.09
TOTAL	24	100.00	39	100.00	52	100.00	115	100.00

F. Place of Storage

There are 75 (65.22%) salt producers with warehouses, of varying capacities, to store their salt (Table 5). The remaining 40 (34.78%) producers store their salt near the production site. Most of the small salt producers do not have warehouses because their produce can easily be claimed by the buyers on site aside from the fact that even before the salt is harvested, full payment for the produce have been made by the buyers.

The length of storage time for the salt produced varies.

Warehouses, especially for the big and medium scale producers, could be an ideal site for iodizing the salt produced at the producer level. An iodizing machine of suitable size could be provided.

Table 5. Frequency and Percent Distribution of Salt Producers by Place of Storage and Area

PLACE OF STORAGE	PANGASINAN		BULACAN		OCC. MINDORO		TOTAL	
	No.	%	No.	%	No.	%	No.	%
Warehouse	14	58.33	34	87.18	27	51.92	75	65.22
Near production site (no warehouse)	10	41.67	5	12.82	25	48.08	40	34.78
TOTAL	24	100.00	39	100.00	52	100.00	115	100.00

G. Packing of Salt

The salt produced in the areas surveyed are packed with two types of packing materials (Table 6). More than half of the salt produced are packed using woven high density polyethylene (HDPE), 95 or 82.61%. This type of material is machine-woven and much sturdier than woven polypropylene. Only 25 (21.74%) salt producers utilize woven polypropylene, which generally is recycled material, having been used for packaging of other commodities like sugar and rice.

Packaging of iodized salt may take various forms. However, these packing materials may not be ideal for iodization purposes because iodine will be lost if moisture seeps out of the package. Proper attention should be placed on the type of packaging material to prevent losses of iodine in iodized salt.

Losses of iodine in iodized salt may be minimized when salt is packaged in airtight containers. If this is not feasible, efforts should be made to improve the distribution network to reduce the time interval between the treatment of salt and its consumption ⁽⁷⁾.

Table 6. Frequency and Percent Distribution of Salt Producers by Type of Packing Material and Area

TYPE OF PACKING MATERIAL*	PANGASINAN (n=24)		BULACAN (n=39)		OCC.MINDORO (n=52)		TOTAL (n= 115)	
	No.	%	No.	%	No.	%	No.	%
Woven HDPE**	15	62.5	30	76.92	50	96.15	95	82.61
Woven PP***	12	50.0	11	28.21	2	3.85	25	21.74

* Multiple responses

** High density polyethylene

*** Polypropylene

The buyer shoulders the cost of packing in the three areas. This includes the wages/salaries of the personnel responsible for preparing the salt packages.

H. Cost of Salt Sold

The cost of salt produced per package of 50 kilos in the three areas appears in Table 7. The price of salt from 24 salt producers in Pangasinan ranged from P40.00 to more than P70.00 per package (an average cost of P54.54). For Bulacan, and Occidental Mindoro, the average cost was P37.10 and P29.62 respectively, as of December 1993. These are farm gate prices, which will increase as the salt moves from producers to consumers especially during the rainy season.

Table 7. Frequency and Percent Distribution of Producers by Cost of Salt Sold (per 50 kgs) and Area

COST PER 50 KGS. (P)	PANGASINAN		BULACAN		OCC. MINDORO		TOTAL	
	No.	%	No.	%	No.	%	No.	%
< 25	-	-	-	-	1	1.92	1	0.87
25 - 29	-	-	1	2.56	8	15.38	9	7.83
30 - 34	-	-	6	15.38	37	71.15	43	37.39
35 - 39	-	-	18	46.15	5	9.62	23	20.00
40 - 44	2	8.33	12	30.77	1	1.92	15	13.04
45 - 49	4	16.67	1	2.56	-	-	5	4.35
50 - 59	12	50.00	1	2.56	-	-	13	11.30
60 - 69	2	8.33	-	-	-	-	2	1.74
70 and above	4	16.67	-	-	-	-	4	3.48
TOTAL	24	100.00	39	100.00	52	100.00	115	100.00

I. Type of Buyers

The frequency and percent distribution of producers by type of buyer and area show provincial dealers predominate among the buyers of salt in Pangasinan and Bulacan (Table 8). Salt dealers have facilities like warehouses to store the salt. They own bancas or "cascos" and have ready markets or outlets for their product. A salt producer may also be a salt dealer. However, in Occidental Mindoro, most salt agents are also the buyers of salt, aside from acting as brokers between the producer and buyer. They do not own warehouses or bancas to transport salt.

Table 8. Frequency and Percent Distribution of Salt Producers by Type of Buyers and Area

TYPE OF BUYERS*	PANGASINAN (n=24)		BULACAN (n=39)		OCC. MINDORO (n=52)		TOTAL (n= 115)	
	No.	%	No.	%	No.	%	No.	%
Agents	2	8.33	1	2.56	35	67.31	38	33.04
Dealers (prov'l)	23	95.83	38	97.44	17	32.69	78	67.83
Sub-dealers (wholesalers)	2	8.33	-	-	-	-	2	1.74
Others	4	16.67	-	-	-	-	4	3.48

* Multiple responses

The average number of buyers by area is indicated in Table 9, which shows that 75 or 65.22% of the salt producers in the 3 areas had an average of 1-3 buyers while 29 (25.22%) had 4-6 average number of salt buyers. However, the quantity of salt bought by each buyer and its final destination are not known.

Table 9. Frequency and Percent Distribution of Salt Producers by Average Number of Buyers and Area

AVE. NO. OF BUYERS	PANGASINAN		BULACAN		OCC. MINDORO		TOTAL	
	No.	%	No.	%	No.	%	No.	%
1 - 3	6	25.00	22	56.41	47	90.38	75	65.22
4 - 6	10	41.67	14	35.90	5	9.62	29	25.22
7 - 9	2	8.33	1	2.56	-	-	3	2.61
10 - 12	5	20.83	2	5.13	-	-	7	6.09
13 and above	1	4.17	-	-	-	-	1	0.87
TOTAL	24	100.00	39	100.00	52	100.00	115	100.00

J. Type of Transportation Used for Delivery

The most common types of transportation used for delivering salt are truck (40.0%), “casco” (31.30%) and ferry (28.70%) (Table 10). A “casco” is a wooden vessel usually without roofing used to transport salt to various places. Other types of transportation are the jeepney, van or pick-up and even buses.

Measures to protect the salt, especially if iodized, should be taken during transport since it can be affected by climatic conditions (e.g. humidity).

Table 10. Frequency and Percent Distribution of Salt Producers by Type of Transportation Used for Salt Delivery and Area

TYPE OF TRANSPO.*	PANGASINAN (n=24)		BULACAN (n=39)		OCC. MINDORO (n=52)		TOTAL (n= 115)	
	No.	%	No.	%	No.	%	No.	%
Bus	1	4.17	-	-	-	-	1	0.87
Truck	22	91.67	2	5.13	22	42.31	46	40.00
Jeep	1	4.17	-	-	2	3.85	3	2.61
Van	2	8.33	-	-	-	-	2	1.74
Pick-up	1	4.17	-	-	-	-	1	0.87
Boat	2	8.33	1	2.56	1	1.92	4	3.48
Ferry	1	4.17	1	2.56	31	59.62	33	28.70
Tricycle	1	4.17	-	-	-	-	1	0.87
“Casco”	-	-	36	92.31	-	-	36	31.30

* Multiple responses

K. Overall Salt Production

Annual salt production amounted to 184,186 metric tons (MT) in the three areas with Pangasinan producing most of it (74,765 MT) followed by Bulacan (71,419 MT) and Occidental Mindoro (38,002 MT) as of December, 1993 (Table 11).

The medium salt producers contributed 90,377 MT (49.07%), followed by the big producers with 74,715 MT (40.56%), and small producers with 19,094 MT (10.37%).

Table 11. Quantity of Salt Produced (in MT) by Area and Classification

AREA	SMALL		MEDIUM		BIG		TOTAL	
	Qty	%	Qty.	%	Qty	%	Qty.	%
Pangasinan	3,240	16.97	8,025	8.88	63,500	84.99	74,765	40.59
Bulacan	3,383	17.72	62,511	69.17	5,525	7.39	71,419	38.78
Occ. Mindoro	12,471	65.31	19,841	21.95	5,690	7.62	38,002	20.63
TOTAL	19,094	100.00	90,377	100.00	74,715	100.00	184,186	100.00

L. Salt Production of Big Producers

As of 1993, the six (6) big producers in the areas surveyed accounted for a total production of 74,715 MT of salt. Of this amount, 44,715 MT (59.85%) were for human consumption and 30,000 MT (40.15%) for industrial purposes which was produced only by one big producer in Pangasinan.

The big producers in Pangasinan contributed 33,500 MT (74.92%) of the total salt produced for human consumption (44,765 MT) (Table 12). The other big producers in Bulacan and Occidental Mindoro provided 5,525 MT (12.36%) and 5,690 MT (12.72%) respectively.

M. Quantity (in MT) of Salt Sold

The quantity of salt sold for human consumption by area and classification is shown in Table 13. Among the salt producers in the three areas, Bulacan sold the most number of salt 71,419 MT (46.32%), followed by Pangasinan which sold 44,765 MT (29.03%) and Occidental Mindoro 38,002 MT (24.65%).

Table 12. Quantity of Salt Produced (in MT) From Big Producers by Use

AREA	HUMAN CONS.		INDUSTRIAL		TOTAL	
	Qty.	%	Qty.	%	Qty.	%
Pangasinan	33,500	74.92	30,000	100.00	63,500	84.99
Producer 1	10,750	-	30,000	-	40,750	-
Producer 2	7,500	-	-	-	7,500	-
Producer 3	11,250	-	-	-	11,250	-
Producer 4	4,000	-	-	-	4,000	-
Bulacan						
Producer 5	5,525	12.36	-	-	5,525	7.39
Occ. Mindoro						
Producer 6	5,690	12.72	-	-	5,690	7.62
TOTAL	44,715	100.00	30,000	100.00	74,715	100.00

Table 13. Quantity of Salt Sold (in MT) for Human Consumption by Area and Classification

AREA	SMALL		MEDIUM		BIG		TOTAL	
	Qty.	%	Qty.	%	Qty.	%	Qty.	%
Pangasinan	3,240	16.97	8,025	8.88	33,500	74.92	44,765	29.03
Bulacan	3,383	17.72	62,511	69.17	5,525	12.35	71,419	46.32
Occ. Mindoro	12,471	65.31	19,841	21.95	5,690	12.73	38,002	24.65
TOTAL	19,094	100.00	90,377	100.00	44,715	100.00	154,186	100.00

The quantity of salt sold for human and industrial consumption appears in Table 14. The table shows that only Pangasinan produced salt for industrial purposes (30,000 MT or 40.13% of its total production). The producers in Bulacan and Occidental Mindoro did not mention in the interview whether the salt they produce is for industrial use. However, during the interview of one big salt dealer who buys more than one third (1/3) of the salt produced in these two provinces, it was revealed that around 10,000 MT of these salt go to industrial use. Therefore, in addition to the 30,000 MT from Pangasinan, it is estimated that 40,000 MT or more of the salt in these three provinces are for livestock consumption and industrial use.

The total quantity of salt produced for human consumption constitutes only 72.2% of the estimated 213,571.4 MT total salt consumption of the country's population.

Table 14. Quantity of Salt Sold (in MT) for HUMAN and INDUSTRIAL Use by Area

AREA	HUMAN CONS.		INDUSTRIAL USE		ANNUAL PROD'N	
	Qty.	%	Qty.	%	Qty.	%
Pangasinan	44,765	59.87	30,000	40.13	74,765	100.00
Bulacan	71,419	100.00	-	-	71,419	100.00
Occ. Mindoro	38,002	100.00	-	-	38,002	100.00
TOTAL	154,186	83.71	30,000	16.29	184,186	100.00

N. Destination of Salt Sold

The frequency and percent distribution of salt produced in the three areas and its destination appears in Table 15. Most of the salt produced in Pangasinan was brought to Bulacan (33.33%), Bicol (29.17%) and other parts of Luzon. Majority of the salt produced in Bulacan (94.87%) found its way in Malabon, Metro Manila. Of the 18 places where salt produced in Occidental Mindoro was brought, 26 or 50.0% went to Marinduque, 11 or 21.15% to the Visayas and about 9% to Mindanao areas.

O. Distribution Network of Salt

We also gathered from the salt producers the sequence of the movement of salt from the factory to the retail stores and finally to consumers (Figure 5)⁽⁸⁾.

The small, medium and big producers sell majority of their salt to big dealers and to a few sub-dealers or traders. The big dealers store their salt in warehouses and sort out the salt they buy for human consumption, livestock and industry use.

Some big dealers sell to sub-dealers and also to retailers through their own distribution system. The salt may be repacked when sent to provincial sub-dealers or retailers in different parts of the country.

The sub-dealers or traders sell salt to the retail outlets. The retail stores have many ways of repacking salt. Some salt is exposed to other elements and is put in packages only at the time it is bought. Others package the salt in half or one kilo packs usually in transparent plastic bags. There are imported salt including iodized salt, by big dealers, which are used for human, and livestock consumption mostly for food and non-food industry. The imported salt will reach the household as iodized salt or will be consumed as part of processed foods.

Table 15. Frequency and Percent Distribution of Salt Producers by Destination of Salt Sold and Area

DESTINATION*	PANGASINAN (n=24)		BULACAN (n=39)		OCC. MINDORO (n=52)		TOTAL (n= 115)	
	No.	%	No.	%	No.	%	No.	%
Isabela	2	8.33	-	-	1	1.92	3	2.61
Bataan	1	4.17	-	-	-	-	1	0.87
La Union	-	-	-	-	1	1.92	1	0.87
Pampanga	1	4.17	-	-	-	-	1	0.87
Nueva Ecija	1	4.17	-	-	-	-	1	0.87
Tarlac	1	4.17	-	-	-	-	1	0.87
Pangasinan	5	20.83	-	-	2	3.85	7	6.09
Bulacan	8	33.33	1	2.56	-	-	9	7.83
Metro Manila	3	12.5	-	-	1	1.92	4	3.48
Binondo, Manila	-	-	1	2.56	-	-	1	0.87
Muntinlupa, M.M.	-	-	-	-	1	1.92	1	0.87
Malabon, M.M.	-	-	37	94.87	-	-	37	32.17
Pasig, M.M.	1	4.17	-	-	-	-	1	0.87
Cavite	1	4.17	-	-	-	-	1	0.87
Lucena, Quezon	-	-	-	-	5	9.62	5	4.35
Calapan, Mindoro	-	-	-	-	4	7.69	4	3.48
Palawan	-	-	-	-	6	11.54	6	5.22
Bicol	7	29.17	-	-	1	1.92	8	6.96
Marinduque	-	-	-	-	26	50.00	26	22.61
Cebu	-	-	-	-	1	1.92	1	0.87
Davao	-	-	-	-	1	1.92	1	0.87
Cagayan de Oro	1	4.17	-	-	1	1.92	2	1.74
Jolo, Sulu	-	-	-	-	1	1.92	1	0.87
Luzon	-	-	-	-	1	1.92	1	0.87
Visayas	-	-	-	-	11	21.15	11	9.57
Mindanao	-	-	-	-	2	3.85	2	1.74
Nationwide	-	-	-	-	8	15.38	8	6.96

* Multiple responses

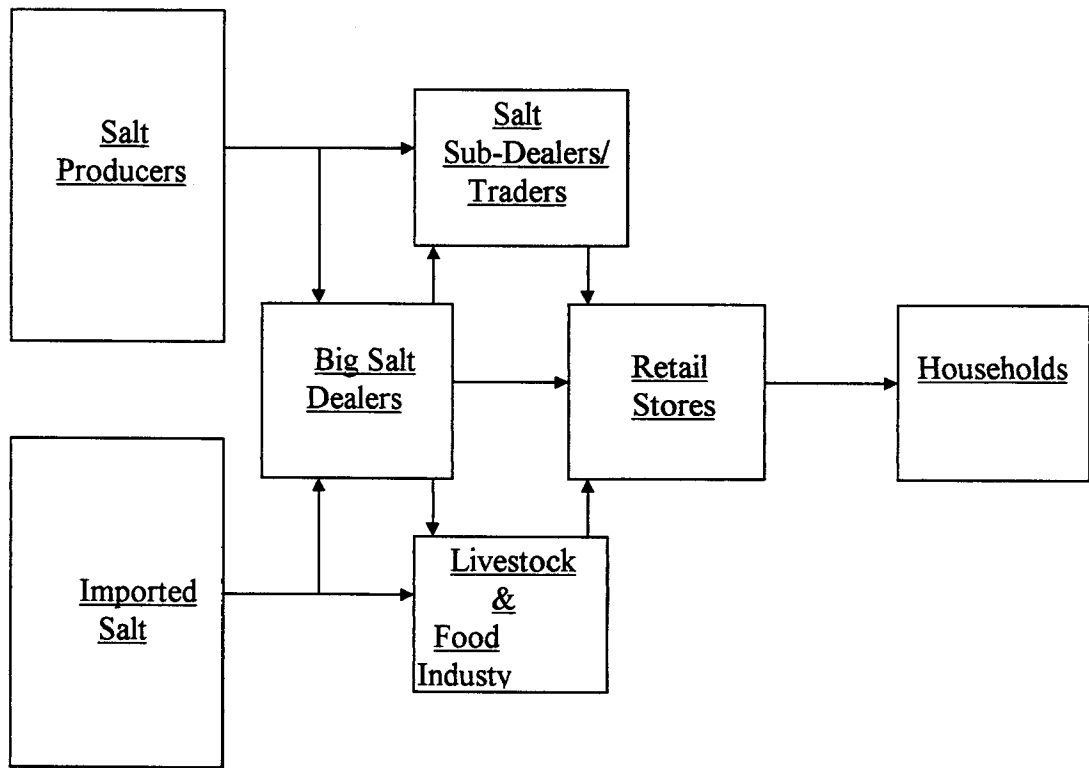


Figure 5. Distribution Network of Salt

P. Comparison of Salt Production by Source of Information

The data generated by the NCP in 1993 from among 115 salt producers in the three areas showed that there were 184,186 MT produced. Mr. M.G. Venkatesh Mannar in his paper "Control of Iodine Deficiency Disorders (IDD) Through Iodation of Salt (1992)" estimated 240,000 MT produced in the same areas. Likewise, data obtained from the BOM gave a total of 174,966 MT produced in 1991 in the 3 areas mentioned (Table 16).

Table 16. Salt Production (in MT) by Area and Source

AREA	NCP		M.G.V. Mannar		BOM	
	Qty.	%	Qty.	%	Qty.	%
Pangasinan	74,765	40.59	90,000	37.50	35,486	20.28
Bulacan	71,419	38.78	110,000	45.83	54,215	30.99
Occ. Mindoro	38,002	20.63	40,000	16.67	85,265	48.73
TOTAL	184,186	100.00	240,000	100.00	174,966	100.00

NCP - Nutrition Center of the Philippines, 1993

M.G.V. MANNAR - M. G. Venkatesh Mannar, Control of IDD Through Iodation of Salt, Philippines, 1992

BOM - Bureau of Mines, Overall Mineral Production, Philippines, 1991

Q. Salt Importers

Thirty-two (65.31%) out of 49 salt importers imported industrial salt (Table 17). Likewise, there were 6 importers each for pure sodium chloride and other common salt. Only 5 (10.20%) imported table salt.

Table 17. Frequency and Percent Distribution of Salt Importers by Type of Salt Imported, Philippines, 1993

TYPE OF SALT IMPORTED	NO.	%
Industrial Salt	32	65.31
Table Salt	5	10.20
Pure Sodium Chloride	6	12.24
Other Common Salt whether or not in aqueous solution	6	12.24
TOTAL	49	100.00

In 1992, the country imported 22 MT of table salt, 77,468 MT of industrial salt, and 67 MT of other common/crude salt (Tables 18 and 19). The type of salt imported was coarse and fine.

The 1993 data covers the period from January to November only. During this period, the country imported 22 MT of table salt, 66,272 MT of industrial salt and 82 MT of common/crude salt.

Tables 18 and 19 also show the countries where salt was imported. The sources of imported table salt in 1993 were U.S.A. (18.25%) and Hongkong (81.75%). On the other hand, industrial salt were mostly imported from Australia (45.68%), Japan (17.50%), Guam (14.26%) and Germany (12.61%). Likewise, the crude/common salt were obtained from Germany (75.13%) and Netherlands (24.87%). It may be noted that the importation of table and industrial salt has drastically dropped from 1989 to 1983. The source of this information does not indicate however whether the salt is iodized or not. Likewise, it does not also indicate how much of the imported industrial salt are converted into table salt for human consumption.

Table 18. Quantity and Percent Distribution of Imported Salt (in MT) by Type of Salt Imported, Country and Year

COUNTRY	1993		1992		1991		1990		1989	
	MT	%	MT	%	MT	%	MT	%	MT	%
Table Salt										
1. United Kingdom & G. Britain & N. Ireland							379	89.17	482	41.92
2. New Zealand							40	9.42	20	1.74
3. Germany							4	0.91	647	56.24
4. U.S.A.	4	18.25			2	2.36	2	0.51	1	0.10
5. Singapore										
6. Netherlands										
7. China										
8. Israel			22	100.00	69	97.64				
9. Hongkong	18	81.75								
TOTAL	22	100.00	22	100.00	71	100.00	425	100.00	1,151	100.00
Industrial Salt										
1. Australia	30,273	45.68	43,107	55.65	62,352	79.15	49,637	44.87	65,905	31.79
2. Germany	8,355	12.61	13,460	17.38	10,678	13.55	12,863	11.63	10,637	5.13
3. Netherlands			1,244	1.61	1,074	1.36	1,741	1.57	292	0.14
4. China	4,502	6.79	10,100	13.04	3,000	3.81	34,030	30.76	59,533	28.72
5. India							8,983	8.12	69,124	33.35
6. United Kingdom & G. Britain & N. Ireland	977	1.47	416	0.54	210	0.27	1,680	1.52	880	0.42
7. Israel	623	0.94	1,398	1.80	1,269	1.61	1,534	1.39	846	0.41
8. U.S.A.	24	0.04	155	0.20	123	0.16	89	0.08		
9. New Zealand	14	0.02	10	0.01			20	0.02		
10. Belgium							22	0.02		
11. Hongkong	58	0.09	32	0.04	52	0.07	22	0.02	1	0.00
12. Singapore	400	0.60	494	0.64					42	0.02
13. Taiwan									21	0.01
14. Thailand			399	0.52	20	0.03				
15. Guam	9,450	14.26	6,600	8.52						
16. Japan	11,596	17.50	53	0.07						
TOTAL	66,272	100.00	77,468	100.00	78,778	100.00	110,621	100.00	207,281	100.00

* Source: Department of Trade and Industry (values converted to MT)

Table 19. Quantity and Percent Distribution of Other Imported Crude/Common Salt (in MT) by Country and Year

COUNTRY	1993		1992		1991		1990		1989	
	MT	%	MT	%	MT	%	MT	%	MT	%
Other Crude/Common Salt										
1. Germany	62	75.13			239	11.85	218	100.00	108	100.00
2. U.S.A.			1	1.42	1,400	69.58				
3. China										
4. Singapore			14	21.58						
5. Netherlands	20	24.87	22	32.15	144	7.14				
6. Israel					215	10.69				
7. New Zealand					15	0.75				
8. Australia			30	44.85						
TOTAL	82	100.00	67	100.00	2,012	100.00	218	100.00	108	100.00

* Source: Department of Trade and Industry (values converted to MT)

V. RECOMMENDATIONS

1. The survey conducted in the three provinces revealed that there are no accurate updated information/ data on the salt producers regarding their names, sites of production, annual production and on whether the salt produced will be for human and livestock consumption or for industrial use. It was found out that no central government agency can provide all these data.

It is recommended that the DOH shall organize a salt databank unit at the Nutrition Service to collect and analyze information gathered from salt producers in the different areas. An annual statistical report incorporating all these data shall be prepared for utilization in policy and program concerns of government and non-government organizations.

2. The survey also revealed that some salt producers are not registered in their respective Local Government Units as salt producers but as other businesses, like fish farms. This usually occurs when the farm has a dual purpose such as fish farming during the rainy season and salt farming during the dry season, resulting in incomplete registration of salt producers in the area.

It is recommended that the Local Government Units identify and require the salt producers to register in their respective pertinent local government offices as salt producers and provide information on their name, address and annual production.

3. It was experienced during the survey that we were unable to obtain information from important salt dealers inspite of repeated requests for interview, except for one big salt dealer.

It is recommended that the DOH shall invite the big salt dealers and undertake advocacy on their roles in the entire salt iodization program. In addition, the dealers shall provide information on: the amount of salt they buy from the salt producers, how much is earmarked for human and livestock consumption and industrial use, where salt is distributed and in what form and for process (i.e. purification) the salt undergoes before distribution.

4. The survey was conducted in only three provinces. To get a comprehensive picture of the salt industry in the country and to facilitate the development and formulation of a National Program for Salt Iodization, it is recommended that a survey not only of salt producers but also of dealers/ traders, retailers and a sample of households be conducted in the other salt producing areas of Luzon, Visayas and Mindanao.

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