Anusandhanvallari
Vol 2026, No.1
March 2026
ISSN 2229-3388

A Study on Problems of Salt Pan Producers in the Coastal Areas of Thoothukudi District, Tamil Nadu

[*1]N. Abinash, [2]Dr. G. Karthikeyan

[*1]Ph.D. (Full-Time) Research Scholar, PG & Research Department of Commerce, A.V.C. College (Autonomous), (Affiliated to Bharathidasan University, Tiruchirappalli.) Mannampandal, Mayiladuthurai District- 609305, India.

[2]Assistant Professor, PG & Research Department of Commerce, A.V.C. College (Autonomous), (Affiliated to Bharathidasan University, Tiruchirappalli,) Mannampandal, Mayiladuthurai District- 609305, India.

Abstract

Thoothukudi district is the second largest producer of salt in India after Gujarat. The salt producers of Thoothukudi district employ more than 30,000 labours and producing approximately 25 lakh tonnes of salt every year during March to September. However, in the last two years, salt production has significantly declined due to unexpected and prolonged rainfall in the area. This decline has adversely affected the livelihood of salt producers and has substantially reduced the overall productivity of the district. In this research paper an attempt is made to analyse the problems faced by salt producers in Thoothukudi District of Tamil Nadu. The study was made by the researcher about the difficulties faced by the salt pan producers in the study district under seven broad categories. To determine the severity and ranking of these problem, the Henry Garrett Ranking technique has been employed. The findings outcomes offer the key insights that can assist policymakers and stakeholders in creating effective measures to support salt producers and enhance sustainable salt production within the region.

Keywords: Salt Producers, Salt Production, Prolonged Rainfall, Livelihood Impact, Henry Garrett Ranking Technique, Sustainable Production.

1. Introduction

One of the necessities for human existence is salt. Additionally, it is among the earliest commodities to be manufactured, traded, and exchanged (1). Salt is one of the core food products that India produces and exports, and it helps the country to earn foreign currencies. Salt contributes export revenues comparable to those of seafood and continues to grow annually, positioning it among India's most valuable mineral resources. With favourable natural conditions, Thoothukudi district ranks second in national salt production, following Gujarat. Thoothukudi district has salt pans in Vembar, Soorangudi, Veppalodai, Pattinamarudhur, Tharuvaikulam, Ayyanarpuram, Muthaiyahpuram, Mullakkadu, Pullaveli, Pazhayakayal, Kovankadu and Arumuganeri. More than 30,000 labours and produced 25 lakh tonnes of salt every year during the month of March to September. The production reaches its peak between April and September.

2. Review Of Literature

Murugan S and Muthalagu K (2017), in their research study they studied that the production and marketing problems of small-scale salt pan producers in Tamil Nadu. In their study they selected 580 salt producers through simple random sampling technique. Further they pointed out that there are three main salt manufacturer

districts in the state of Tamil Nadu viz., Thoothukudi, Ramanathapuram and Nagapattinam. These three districts produce around 85 percentage of the salt production of Tamil Nadu. Aforementioned districts together allocate almost 30,000 acres of land for salt manufacturing operation.

Geetha Maheswari B (2019), in her research study pointed out that in the state of Tamil Nadu Thoothukudi District is the major manufacturer of salt. The salt manufacturers situated in Thoothukudi district are facing lot of problems like severe competition from the state of Gujarat, adverse climate situations, rainfall and labour issues etc. In Thoothukudi district the salt manufacturing cost is inflated as matched with the state Gujarat. Further the level of profit is also low and instable. Even with the above-mentioned problems the salt manufactures in Thoothukudi district are performing their salt production work from generation to generation continuously. According to her research findings, Thoothukudi's salt manufacturers earn greater profits at intervals of three to four years, with diminished profit levels occurring in the intervening years.

G.Arumugasamy & R.Sam Renu (2013) in his article entitle *"Problems and Prospects of Salt Industry in Kanyakumari District" t*he main objectives the articles are to make detail the processes involved in salt production. The State and Union governments have historically assisted salt companies, but in recent years, workers have not received adequate attention. Consequently, labourers are reluctant to engage in salt-pan work. Working in these conditions for 10 to 20 years often results in severe illness. Since the industry provides no medical support, workers are hesitant to accept such employment. If the government implements strategies to raise local demand for salt, the salt industry in Kanyakumari District could experience significant development.

J. Jeyarajan in 2011 research study entitled *"Salt production and trading in south India"* his study offers an overview of production of salt in Tamilnadu. From 250 Participants there are 100 salt merchants and 150 salt manufacturers are participated. Data collection involved both primary sources, through questionnaires, and secondary sources, drawn from published and unpublished records of the salt department. Percentage analysis was utilized to evaluate aspects such as the salt trade network, producer and trader types, varieties of salt, and logistics systems. The study findings suggest that small-scale Tamil Nadu salt producers are primarily engaged in crude salt production, whereas processing, packaging, and distribution are performed by intermediary traders who supply the final product to consumers.

Norma B. Muyot, et.al., (2022) in their research study entitled *"Constraints and Challenges of Salt Farming in Occupational Mindoro, Phillippines"* they concluded that in the study region majority of the salt producers not owning warehouse to stock their produced salt and practice bags mainly to store their produced moreover for storing or for trading with the Sellers. Further in their study they mentioned that the most predominant problems faced by salt producers in Occidental Mindoro, Philippines are climate change and volatile weather conditions seriously disturbing the salt manufacture season, lack of departmental guidance to the local salt producers, huge expenses of transportation, non-availability of capital, non-availability of facilities to identify the salt quality and absence of post-cultivation amenities and know-how.

Tilman B. Drüeke In his 2007 research study entitled *"Man Needs Salt to Survive,"* examines the hypothesized relationship between high salt intake and the development of hypertension. He also explores the political dimensions of the ongoing debate regarding the benefits and drawbacks of population-wide salt restriction, as well as findings from observational studies on the association between salt consumption and cardiovascular or overall mortality—results that often appear contradictory. To address these questions, Drüeke applies several analytical methods, including multiple regression analysis, which he uses to illustrate the link between salt intake and elevated blood pressure observed in both humans and experimental animals. The study concludes that current public health efforts should not focus solely on determining how much sodium should be reduced, but rather on promoting a healthy, balanced diet for the general population and targeting the primary, well-established causes of cardiovascular morbidity and mortality.

W. Sauren Wolchock, in his 2006 research study entitled *"Impacts of Salt Production on Pemba,"* examines the economic, social, and environmental consequences of salt production along Pemba Island's eastern coast. To evaluate the sustainability of the industry, he conducted interviews with owners, employees, and day labourers from 20 salt farms. Field investigations were also carried out to study nearby mangrove ecosystems and to measure salinity levels. The discussions with farm owners covered topics such as the history of their operations, production methods and scale, operational costs, employee wages, selected environmental indicators, and the use of mangroves. Interviews with day labourers explored their seasonal work patterns, periods of unemployment, wage payments, and other benefits. The study found that workers employed throughout the full production season are generally paid only at the end of the season, whereas day labourers receive their wages during the harvest period.

J. Vishwamoorthy, in his 2006 research study entitled *"A Study on Salt Production by Co-operatives in Tamil Nadu"* looks at how co-operative societies take part in producing salt in the state. Out of eleven co-operatives in the area, four were selected for the study. Primary information was collected through questionnaires, and secondary information came from official records, books, journals, and other publications. The study examines issues such as financial problems in buying and distributing edible salt, the effect of urban growth on salt-producing areas, and the lack of technology and infrastructure needed for packaging and marketing edible salt. It concludes that financial and infrastructural problems prevent the co-operatives from performing better in the region.

B. Abay Gupta in his Research study entitled *"The Growth of Salt Industry in India"* explores the performance and output levels of salt-producing industries in the country over recent years. A group of 100 salt manufacturing firms was selected through a convenience sampling technique to obtain primary information, while supplementary data were sourced from official documents and reports issued by the salt departments of various states. The research evaluates several major aspects, including the progress of productivity in the Indian salt sector during the pre-reform era, the effects of economic liberalization, and the variables influencing the industry's efficiency—such as elevated inflation and the lack of accessible credit. These issues were evaluated using a time-varying stochastic frontier framework. The study concludes that numerous companies still function below the desired efficiency standard and that ongoing efforts to upgrade machinery and modernize technology are essential for enhancing efficiency in the salt production industry.

R. Ananthalaxmi in his 2006 research study entitled "*A Study on Supply Chain of Salt in Thoothukudi District"* examines the chain of commercial activities and the interconnections among businesses necessary to transport salt from producers to the ultimate consumers. To collect primary information, the study selected a sample of 50 salt manufacturers and 75 salt merchants using a convenience sampling approach. The research explores several critical challenges, including marketing and financial hurdles faced by salt merchants, the limited capacity of iodization plants owned by saltpan operators, inadequate arrangements for salt exports, and the lack of knowledge among traders regarding digital or online marketing of salt. These issues were evaluate in detail through percentage-based analysis .The study concludes that salt producers in the study area restrict their operations to producing raw salt, while the task of adding iodine to the salt is undertaken by the traders.

V. Ganesamoorthy in his 2009 Research study entitled *"Production and Distribution of Salt By-products in Thoothukudi District,"* examined the use of salt by-products in the region. A sample of 25 manufacturing units was surveyed using structured questionnaires, and ANOVA was applied to assess differences among cultivation areas regarding factors influencing by-product production. Secondary data were sourced from salt department records, journals, books, and online references. The study found that technological limitations exist, and edible salt is utilized not only for consumption but also in industries such as caustic soda, soda ash, detergents, fish

curing, tanning, paper production, and milk processing. Veppalodai in the thoothukudi circle was identified as the leading producer of gypsum, a key salt by-product.

S. Ganesan and R. Aruna in their 2011 Research study entitled *"Reduction in Salt Production in Kanyakumari: Reasons"* explores the economic aspects of the salt industry and investigates the causes behind the decline in salt production in Kanyakumari District, particularly in Kovalam and Manakudy villages. Primary data were collected from 170 salt workers in the district's salt pans through a non-random sampling technique. The study also analyzed the production methods, costs involved, and distribution strategies employed by salt producers in the area. The research suggests that the government should establish a fair and sustainable price for both regular and iodized salt. Furthermore, making salt available through ration shops could encourage producers to pay higher wages to their workers. The study also notes the paradoxical situation in which individuals producing such an essential commodity continue to live in poor conditions.

Venketesh mannar and Rizwan Yusufal in their 2013 research study article entitled *"Salt Production and Trade in Africa"* investigates salt manufacturing practices across African nations, noting that out of a total global production of 181.5 million tonnes, Africa contributes approximately 5 million tonnes. The study highlights that in numerous Sub-Saharan countries, salt production methods remain traditional, and in certain regions, are still rudimentary. The study recommends that governments in these regions should, at the very least, establish uniform iodization standards, eliminate trade barriers, build institutional capacity, and oversee programs aimed at harmonizing cross-border trade in iodized salt. It underscores the need for proper iodization through pre-shipment certification and verification at entry ports, encourages voluntary collaboration among salt producers to support Universal Salt Iodization (USI) initiatives, and calls for strengthening distribution

M. Satya Narayan Mishra, in his research study article entitled *"Salt Manufacture in Balasore"* explores the salt industry in Balasore District, one of the key regions for salt production in northern Odisha. The study examines production methods, with particular attention to the PANGA system, the purification of salt, the socio-economic conditions of salt workers, the vulnerability of salt production to natural disasters, and the reasons behind the government's closure of the Sartha Salt Factory. The study finds that formal local salt production came to an end around 1899–1900, marking the decline of a traditional industry that had supported the livelihoods of many people in the district and provided an essential component of the local diet.

R. Banumathi and S. Nadarajan in his research article entitled *"Marketing Strategies and Practices with Reference to Salt Industries in Tamil Nadu, India"* examined the marketing approaches adopted by salt manufacturers in the state. Primary data were gathered from 100 employees in various salt factories through non-probability sampling technique. The research aimed to analyse the marketing strategies implemented by the Indian salt industry and to assess the influence of key players in the market. Findings indicated that marketing strategies used nationally were largely mirrored in Tamil Nadu. Competitive pricing of iodized salt proved particularly effective, with brands such as Tata Salt and Annapurna securing the largest market dominance. The study indicates that companies employed diverse promotional tactics. Pricing strategies varied, with some firms using competitive pricing while others opted for premium pricing. Branding approaches differed as well, with some companies emphasizing product purity and cleanliness, and others highlighting health benefits. Additionally, manufacturers introduced various product variants, including low-sodium, iron-fortified, and double-fortified salts. Among these strategies, competitive pricing of iodized salt emerged as the most successful, contributing to higher popularity and greater market penetration for the brands adopting it.

3. Statement Of The Problem

Salt is an essential and most vital for preparation of food. Without salt we cannot do anything for the preparing the food. It is mostly available certain food products viz., fruits and vegetables, cereals and the others etc., it is a mineral which provides ingredient vital for the human body by way of helping metabolism functions of all the living things in the world. It is one of the mineral diet around all the living organisms in the planet, it is helpful for plants also. Salt is the most important and inevitable things after the natural resources like air, water, sunlight. Like the primary requirements, salt is available in large quantities by way of utilising the various sources viz., Salt occurs in multiple forms, including sea brine, lake brine, sub-soil brine, and rock salt deposits. Its strategic and economic significance, potentially exceeding that of gold, becomes most apparent in conditions of scarcity. Nevertheless, this essential natural resource is abundantly available within India. Notably, the state of Tamil Nadu, endowed with an extensive coastline of approximately one thousand kilometres, exhibits considerable potential for salt production. This potential has been judiciously harnessed in the Thoothukudi District, which alone accounts for over 80% of the state's total salt output, thereby underscoring its critical role in regional and national salt production.

As with agricultural activities, salt production demands heavily on human intervention to obtain optimal output. The process is strongly influenced by several natural and environmental hazards like heavy rainfall, polluted winds, and the other difficulties faced by the salt producers such as inattention of demand, labour scarcity, competitors of local market, supply insufficient, Lack of proper regulation framed by the Government, Price fluctuations, etc. Accordingly, revenue from the salt sector remains highly unstable. Producers' capacity to manage risk depends on personal, economic, environmental, and chronological factors, such as age, education, occupation, income, family size, and production management practices. Salt production in Thoothukudi has declined sharply in recent years due to multiple reasons. Market dynamics are shifting, as demand in both domestic and international markets is unpredictable. The industry is also affected by labor shortages, as younger workers are reluctant to work in salt pans, and the area under salt cultivation continues to decrease annually.

The current study is made attempt to identify the various problems and prospects of salt producers in the Thoothukudi District of Tamil Nadu. Therefore, this study was undertaken to examine multiple factors, including the problem encountered by salt producers, the role of salt associations, assistance from the salt department, profitability, supervision of workers, and their level of job satisfaction.

4. Need For The Study

Food would seem insipid without salt, which is a necessary product. Despite being a modest addition to our diet, it needs a substantial amount of labour and capital to produce. Since it produces the most salt in the state, Thoothukudi district is known as the "salt capital" of Tamil Nadu. Understanding the problems faced by the salt producers in the Thoothukudi is therefore essential. Therefore, this research study is carried out scientifically to investigate the problems faced by salt producers in Thoothukudi district, Tamil Nadu.

5. Scope Of The Study

In this study focussed to determine the various challenges encountered by the salt producers in the Thoothukudi District of Tamil Nadu. To resolve the problems the study helps to trace the measures to overcome it.

6. Objectives Of The Study

The study is aim to achieve the following objectives. They are:

- To determine the demographic features of the salt manufacturers in the field of study.
- To analyse the growth and development of salt production.
- To analyse the various challenges encountered by the manufacturers of saltpan industries in the research area.

7. Research Methodology

7.7.1 Source of Data

The present research study relies on the combination of primary data and secondary data. The primary data were obtained from well-structured interview schedule from the salt producers in Thoothukudi District, Tamil Nadu. The secondary data are taken from various published sources like, Report received from authorities, research publications, books, articles in various journals and websites.

7.7.2 Study area and Location of saltpan

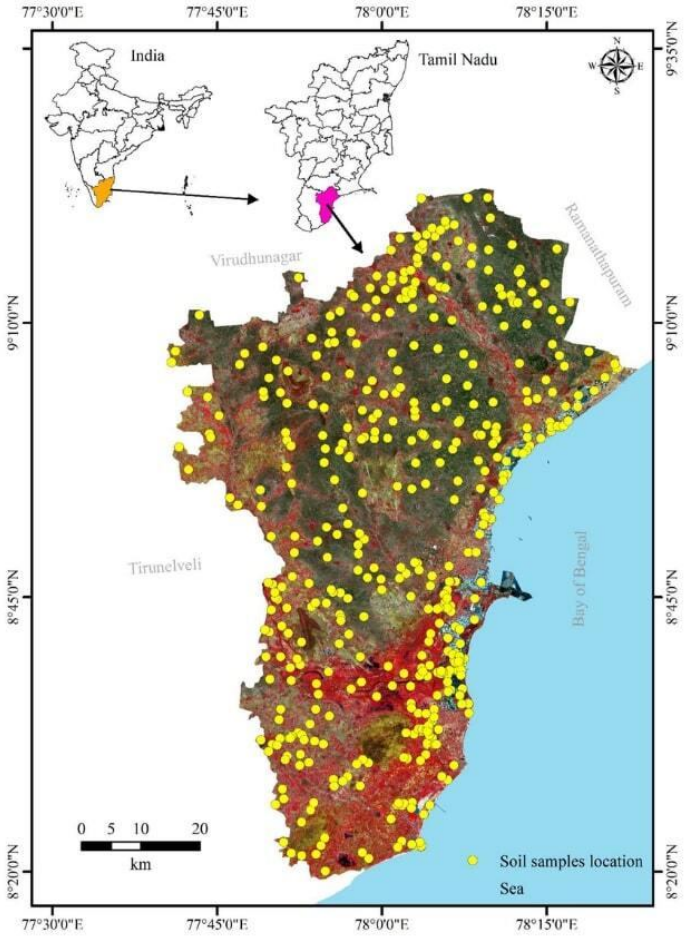

Figure 7.2. Location of Saltpan in Thoothukudi District

In India, Thoothukudi is the largest salt production areas after Gujarat. The marked areas in the above maps (Figure 7.2) reveals the Location of saltpan or salt production areas of Thoothukudi District of Tamil Nadu. The yellow dot represent in the above (Figure 7.2) is soil sample location which is suitable for saltpan field for salt production. The places of taking sample and producers in the study are Mullakadu, Veppalodai, Kovankadu, Arumuganeri, Pazhaykayal, Pullaveli, Soorangudi, Pattinamaruthur, Vembur, etc., the samples are taken from the above mentioned areas of Thoothukudi District.

7.7.3 Sampling Technique

The researcher has conducted a survey with 384 salt producers in Thoothukudi district of Tamil Nadu State in South India. Salt producers have been randomly selected for this research study to obtain their response. Before going for the survey, the researcher has determined the size of the sample by using the following formula as suggested by Cochran[1]

$$n_0 = Z^2pq/e^2$$

Where,

n_0 Is sample size,

Z = Selected critical value of desired confidence level,

p = Estimated proportion of an attribute that is present in the population or universe,

q = 1-p

e is the desired level of precision

$$n_0 = Z^2pq/e^2$$

z =1.96; p = 0.5; q =1-0.5 = 0.5; e = 0.05;

$$n_0 = (1.96)^2(0.5)(0.5)/(0.05)^2$$

= 3.8416 X 0.5 X 0.5 / 0.0025

= 0.9604/0.0025

= 384.16

= 384

Therefore, Sample Size is 384

8. Limitations of the Study

The following are the limitations of the study. They are

- The study confined only to Thoothukudi District of Tamil Nadu
- Due to time constraints, the sample size is restricted with the 384
- The study is restricted only the problems faced by the producers in the Thoothukudi District

Table 1: Demographic Profile of the Respondents

	No. of Respondents	Percentage (%)
Gender wise classification		
Male	341	89
Female	43	11
Age wise Classification		
Below 30	42	11
30 – 40 years	123	32
40 – 50 years	161	42
Above 51 years	58	15
Education Wise		
Upto HSC	104	27
Degree	188	49
Others	92	24
Marital Status		
Married	355	92
Unmarried	29	8
Income wise		
Below 1,00,000	112	29
1,00,000 to 2,0,0,000	100	26
2,00,000 to 3,00,000	92	24
3,00,000 to 4,00,000	42	11
Above 4,00,000	38	10
Total	384	100.00

Source: Primary Data

Table 1 depicts the demographic features of the respondents in the field of study, it was observed from the table out of 384 respondents, majority of the respondents are belonged to the male followed by 43 respondents were female producers. It was noted from the table 42% of the respondents are belonged to the age group of 40 to 50 years of age, followed by 32% of the respondents are in the age group of 30 to 40 years of age, 15% of the producers were belonged to more than 51 years of age and only 11% of the respondents were taken in the age group of below 30 years. It was identified from the table, majority of the respondents are taken as literate, out of 384 sample respondents 188 producers are qualified and completed their degree course, followed by 104 producers are in the study area completed the education level up to HSC and 92 respondents are opined that they preferred others viz., Diploma courses, Certificate Courses, Professional Courses, etc., In opinion

about marital status of the respondents 355 producers are opined as Married followed by 29 respondents are opined that their marital status is unmarried. The table presents the distribution of monthly earnings among saltpan producers in the study area. Nearly 29% of respondents earned below Rs. 1,00,000, 26% reported incomes between Rs. 1,00,000 and Rs. 2,00,000, and 24% earned Rs. 2,00,000 to Rs. 3,00,000. Furthermore, 11% had monthly earnings of Rs. 3,00,000 to Rs. 4,00,000, while only 10% earned more than Rs. 4,00,000.

Table 2: EXPERIENCE IN SALTPAN INDUSTRY

Experience	No. of Respondents	%
Less than 5 years	41	10.68%
6 to 10 years	81	21.09%
10 to 15 years	134	34.90%
More than 16 years	128	33.33%
Total	384	100.00

Source: Primary Data

Table 2 clearly depicts the personal experiences of the saltpan producers in the study region of Thoothukudi District, it was observed from the table 34.90% of the producers possessed 10 to 15 years of experience in the field of saltpan industries, while 33.33% had morethan 16 years of experience, followed by 21.09% of the respondents are having 6 to 10 years of experience and it was noted that only 10.68% of the producers are less than 5 years in the field of saltpan production experience.

Table 3: Sources of Finance

Sources	No. of Respondents	%
Owned Fund	87	22.66%
Borrowings from others institution	122	31.77%
Both owned and borrowed	175	45.57%
Total	384	100.00

Source: Primary Data

Table 3 clearly shows the sources of finance obtained by the producers in the field of study, it was inferred that the majority (175) of the respondents are preferred owned capital and borrowed fund, followed by 31.77% of the producers opined that they prefer borrowings from other financial institutions and 22.66% of the producers are opined that they use the business capital through personal holdings of the producers. The table 3 indicates clearly more than 50% of the respondents are prefer borrowed capital to invest the capital into the saltpan industry.

9. Salt Production In Tamil Nadu

Table 4: Salt production trend in Tamil Nadu

Year	Production (In lakh Tonnes)	Annual growth rate
2015-2016	24	-
2016-2017	23.62	-1.583
2017-2018	23.99	-0.042
2018-2019	22.31	-7.042
2019-2020	23.93	-0.292
2020-2021	17.21	-28.292
2021-2022	23.93	-0.292
2022-2023	18.4	-23.333
2023-2024	18.21	-24.125
2024-2025	17.33	-27.792
Mean	**21.293**	
SD	**3.076958**	
CV	**14.450**	
Average Annual Growth Rate = -12.532%		
Compound Annual Growth Rate (CAGR) = -3.20%		

Source: Annual report 2022-23, Ministry of commerce and Industry, Salt department of India.

Table 4 depicts the salt production in Tamil Nadu during the ten years from 2015-2016 to 2024-2025. It was inferred from that the production of Salt in Tamil Nadu decreasing every year at a decreasing rate. The average production of salt in Tamil Nadu during the last ten years is 21.293 lakh tonnes. The deviation from the standard production during the study period is 3.076958. It was noted from the table the average annual growth rate is negatively shown i.e., -12.532%. The Compound Annual Growth Rate (CAGR) is shown negatively during the ten years from 2015-16 to 2024-2025. The production of salt in the year 2023-24 and 2024-25 data is not available, hence it was find out by calculating through statistical techniques i.e., method of least square.

10. Salt Production In India

Table 5: Salt production trend in India

Year	Production (In Million Tonnes)	Annual growth rate
2015-2016	27644	-
2016-2017	29192	5.60
2017-2018	28949	4.72
2018-2019	30033	8.64
2019-2020	28058	1.50
2020-2021	26564	-3.91
2021-2022	26599	-3.78
2022-2023	33801	22.27
2023-2024	33756	22.10
2024-2025	35950	30.05
2029-2030	**41283**	
Mean	**30054**	
SD	**3306.25**	
CV	**9.09**	
Average Annual Growth Rate = **8.72%**		
Compound Annual Growth Rate (CAGR) = **2.66%**		

Source: Annual report, 2022-23, Ministry of commerce and Industry, Salt department of India.

Table 5 clearly shows the salt production in India during 2015-2016 to 20124-2025, it was inferred from the table, the salt production of the year was increased from every year i.e., 2016-17, 2017-18, 2018-19, 2019-20, 2022-23, 2023-24 and 2024-2025 when compared to the base year 2015-2016. But in the years 2020-21 and 2021-22 was decreased when compared to the base year 2015-2016. Due to Corona Pandemic Lock down announced by the Government, the production was slightly down in the two years. It was observed from the table the average production of study period is 30,054 metric million tonnes in India. The average annual growth rate of the 10 years from 2015-16 to 2024-25 is 8.72% it shows the increasing trend of production in India during the study period. The Standard Deviation is calculated as 3306.25 and the Co-efficient of Variation is 9.09, it represents the amount of deviation of the salt production from each year in the study period. The Compound Annual Growth Rate (CAGR) is 2.66%, it reveals the measuring performance of salt production in the study area during the 10 years starting from 2015-2016 to 2024-2025, and this trend is clearly illustrated in the **Figure 10.1** given below. To observe from the salt production is estimated in the 2029-2023 is 41,283 million tonnes.

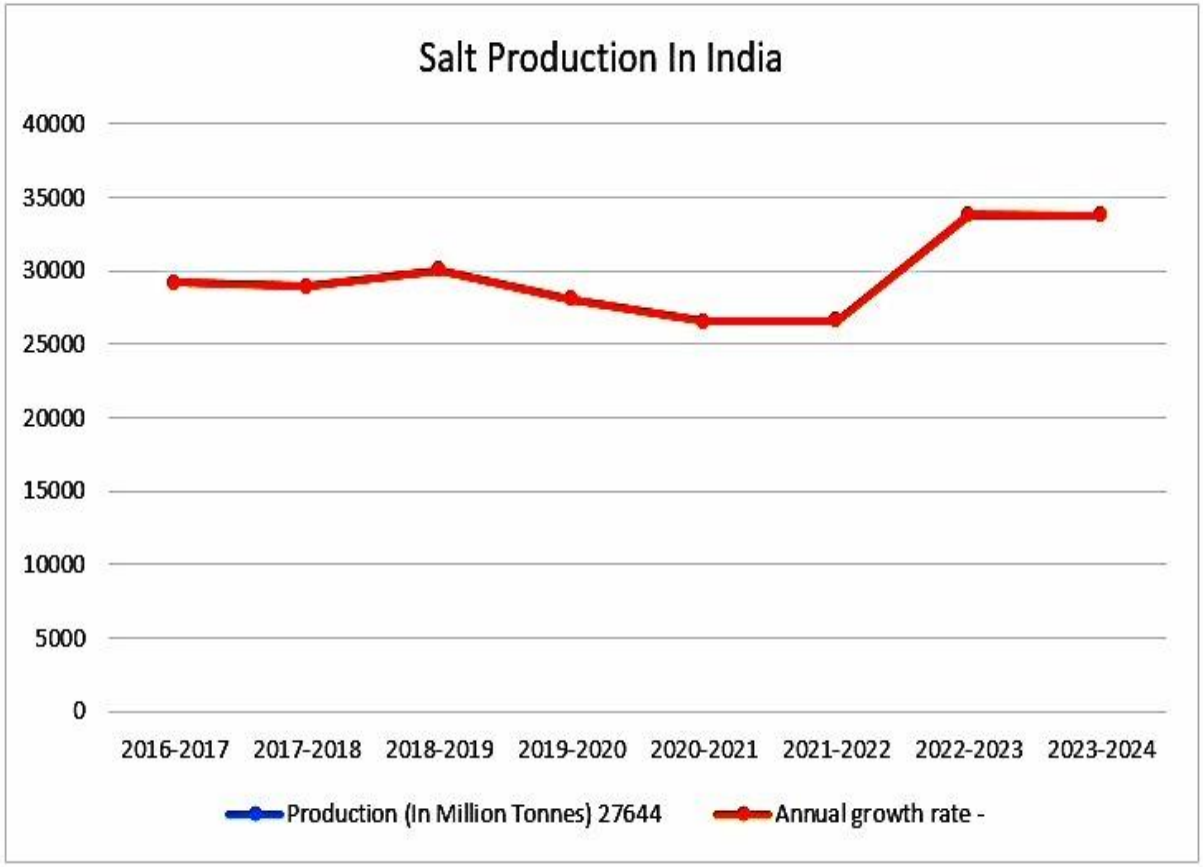

Figure 10.1. Salt Production in India

11. Problems Faced By The Producers Of Salt

The researcher has identified the problems faced by the salt producers in the study district under seven broad categories.

They are:

1. Financial Problems
2. Manufacture Problems
3. Marketing Problems
4. Middlemen Problems
5. Political Problems
6. Labour Problems; and
7. Climate Problems.

In this research study the researcher has used the Henry Garrett Ranking technique to identify the issues faced by the salt producers in the study district. The below mentioned formula is used to calculate Henry Garrett ranking.

$$\text{Henry Garrett Ranking} = = \frac{100\,(R_{ij}-0.5)}{N_j}$$

R_{ij}= Rank given for the ith variable by the j[th] respondent

N_j= Number of variables ranked by the j[th] respondent.

Table 6: Problems faced by the Producers of Salt in Thoothukudi District

Problems	Rank							Total	Total score	Mean score	Rank
	I	II	III	IV	V	VI	VII				
Financial Problems	124	86	70	13	31	49	11	384	23236	60.51	**1**
Manufacture Problems	61	78	76	61	81	24	3	384	21650	56.38	**2**
Marketing Problems	28	40	44	51	75	13	134	384	16269	42.37	**6**
Middlemen Problems	38	43	41	74	98	29	63	384	18195	47.38	**5**
Political Problems	14	19	53	71	28	116	84	384	15784	41.10	**7**
Labour Problems	61	84	38	41	26	106	28	384	19835	51.65	**3**
Climate Problems	59	35	63	73	45	48	63	384	18960	49.38	**4**

Source: Primary Data

The table 6 present the mean score for problems faced by the manufacturer's serially to the rank 1 to 7 are computed. The total scores for each rank were changed into scale values using the 'Scale Conversion Table' propounded by Henry Garrett. The corresponding scale values for ranks 1 through 7 were 78, 66, 58, 50, 42, 34, and 21, respectively. The score value is computed for each issue by calculating the product value of the number of producers serially to the scale. The 'total scores' were calculated by combining the score values of all ranks for each issue. Subsequently, the 'mean score' was determined to identify the priority order assigned by the producers for addressing the issues. Based on these mean scores, ranks were then allocated to each issue.

It is observed from the above Table 6 that 'Financial Problems' has been ranked as number one by the sample producers taken in the field of study. The 'financial problem's faced by the salt producers in the study district are the supply of additional capital, supply of working capital, delay in obtaining financial support from financial institutions and charging high rate of interest by financial institutions and local money lenders. Due to these financial problems, the respondents assigned 'first rank' to the variable 'financial problems.

Increased Manufacturing Cost, lack of Storing facility and Increased Managerial Expenditures is the 'manufacture problems' faced by the sample respondents in the study region. Because of these reasons 'Manufacture Problems' has been ranked as second by the sample respondents in the study region.

The 'Labour Problems' has been ranked as third by the sample respondents in the study region. The 'labour problems' faced by the salt producers in the study district are 'availability of labour', 'enlarged labour cost' and 'migration of labour'. In the study district salt is manufactured between March and September every year. That is to say salt production gives only seven months employment to slat pan workers and during the

remaining months there is no employment opportunities to the salt pan workers. Therefore, in the study region workers involved in the activity of production of salt searching new continuous employment and migrate from Thoothukudi district to other places where regular employment opportunities are available to them.

'Heavy Rainfall', 'Adverse Pace of airstream', 'Natural Disasters' and 'Adverse Temperature' are the 'climate problems' faced by the sample respondents in the study region. Because of these reasons 'Climate Problems' has been ranked as fourth by the sample respondents in the study region. The' Middlemen Problems has been ranked as fifth by the selected manufacturers in the field of study. The 'Middlemen Problems' encountered by the salt producers in the study district are 'Interference of Middlemen in the bargaining power of salt producer' and 'Enlarged Delivery Cost'.

The Marketing Problems has been ranked as sixth by the sample producers in the research district. The Marketing Problems' encountered by the salt producers in the study district are 'Substantial Rivalry from local salt producers', 'Big Rivalry from the state of Gujarat' i-e it occupies first position in the production of salt in our country India, 'Substantial Exportation Rivalry', 'Amplified Transport Charge' and 'Risk of Bad debts due to Credit Sales'. The 'Political Problems' has been ranked as last i-e., seventh by the selected producers in the study area. 'Political Issues' were encountered by the salt producers in the research district are 'Absence of timely support from both central and state governments' and 'Absence of subsidy schemes to salt producers.

12. Suggestions To Resolve The Problems Faced By The Producers Of Salt

The following suggestions are proposed by the researcher to resolve the problems faced by the salt producers in the district of Thoothukudi.

1. So as to solve the financial problems faced by the salt producers the government has to take necessary steps to encourage financial Institutions to lend additional capital and working capital to the salt producers timely as and when they needed at subsidized rate of interest.
2. In order to resolve the 'manufacture problem of salt' the government has to take necessary steps to reduce manufacturing cost by way of offering subsidized electricity tariff and construction of new warehouses for storing salt throughout the district in the place of production of salt and distribution of salt.
3. The labour problems faced by the salt producers in the study district can be resolved by way of adopting modern methods of salt production and introduction of new technologies with automated processes. The assistance scheme in the name of "Off Season Financial Assistance to Salt Pan Workers" has to launched to salt pan workers during 'off Seasons' and 'Natural Calamities Season' for their survival and also stay and continue in the work of salt production in the study district during good season. Further the labour migration problem can also be resolved by way of launching the above-mentioned financial assistance scheme.
4. The 'Middlemen Problems' faced by the salt producers in the study district can be solved through the introduction of the concept direct marketing. The salt producers have to develop their own websites and create awareness about their salt in the minds of wholesale and retail buyers across the country as well as globe. The salt producers have to make tie up with various e-traders to sell their salt directly to the buyers. Through this the salt producers solve the problems of 'Interference of Middlemen in the bargaining power of salt producer' and 'Enlarged Delivery Cost'.
5. The Marketing Problems faced by the salt producers can be resolved by way of launching various new incentives and subsidies scheme by our Tamil Nadu Government. These schemes are necessary to Thoothukudi district salt producers to compete with the salt producers in the State of Gujarat. The Tamil Nadu government has to introduce Export subsidy scheme to encourage export of salt through direct outflows, subsidized loans, tax relief for exporters and government sponsored international advertising. Both Central and State government

has to allocate substantial space in public transport to salt producers to transport salt from the place of production to consumption and also fix transport cost for salt at very low level. The Government has to take necessary step to give exemption in 'Toll Charges' at Toll Plaza to the vehicles involved in the process of distribution of salt in our country.

6. The Political Problems faced by the salt producers in the study district can be resolved by way of extending timely support in the form of financial incentives and implementation of latest technology in the production process by both central and state governments.

13. Conclusion

Salt production has diminished in the last two years because of the decline in salinity due to rains in Thoothukudi district. The Problem encountered by the salt producers in the study area have been categorized into seven major groups as Financial Problems, Manufacture Problems, Marketing Problems, Middlemen Problems, Political Problems, Labour Problems; and Climate Problems. Each of these issues collectively affect the production efficiency, cost of operations and the livelihood of the producers who dependent on this sector. The suggestions presented in this research study are anticipated to guide government authorities, policymakers, stakeholders and salt producers in formulating effective interventions to address these challenges. By implementing the recommended measures can help to ensure production stability, strengthen economic condition of the salt producers and promote sustainable salt manufacturing practices in the thoothukudi district.

Declaration Of Interests

Funding

On Behalf of all authors the corresponding author states that they did not receive any funds for this project.

Conflicts Of Interest

The authors declare that we have no conflict of interest.

Competing Interests

The authors declare that we have no competing interest.

Data Availability Statement

All the data is collected from the simulation reports of the software and tools used by the authors. Authors are working on implementing the same using real world data with appropriate permissions.

Ethics Approval

No ethics approval is required.

Consent To Participate

Not Applicable

Consent For Publication

Not Applicable

Human And Animal Ethics

Not Applicable.

Code Availability

Not Applicable.

Author's Contributions

Author 1: Performed the Analysis the overall concept, writing and editing.

Author 2: Participated in the methodology, Conceptualization, Data collection and writing the study.

14. References

[1] Geetha Maheswari B (2019), "Salt Producers' Perception and Satisfaction towards Salt Industry in Thoothukudi District", Journal of Emerging Technologies and Innovative Research, Vol. 6(6), June 2019, ISSN-2349-5162, pp.466-471.

[2] Glenn D Israel, "Determining Sample Size", University of Florida IFAS Extension, PEOD6, pp. 1-5

[3] Murugan S and Muthalagu K (2017) , "A Study on Production and Marketing Problems of Small-Scale Salt Pan Producers in Tamil Nadu", Indian Journal of Research, Vol. 6(8), August 2017, ISSN - 2250-1991, pp.532-533.

[4] Norma B. Muyot, et.al., (2022), "Constraints and Challenges of Salt Farming in Occidental Mindoro, Philippines", Journal of Multidisciplinary Studies, Vol.2(6), June 2022, ISSN: 0976-7797, pg. 1-9

[5] Abinash N and Dr.G.Karthikeyan (2024), "Impact of the North East Monsoon on the Saltpans of Thoothukudi", Third Concept – An International Journal of Ideas, Vol.38(446), April 2024, ISSN: 0970-7247, pp. 52-53

[6] H.Castro-Nogueria[1], E. Lopez-Carrique[2], P.A. Aguilera, (1997), "Salt Production in Saltpans: A model of sustainable development, Transactions on Ecology and the Environment Vol. 16 ISSN- 1743-3541, pp.73-81.

[7] D. Durairaj[1], S. Murugan[2], (2016), "A Study on Health Hazard of Salt Workers in Tamil Nadu Coastal Areas", International Journal of Pharmaceutical Sciences Review and Research Vol. 40(2), ISSN 0976-044X.

[8] S. Prakash[1], Dr. N. Maria Nevis Soris[2], (2018), "A Study on the Working Condition of Saltpan Workers in Thoothukudi" International Journal of Science, Engineering and Management, Vol. 3, Issue 4, ISSN (Online) 2456-1304, pp. 545-548.

[9] R. AnanthaLaxmi[1], Dr. M. Jeyakumari[2] (2017) "Living Standard of Salt Workers Community in Southern Districts of Tamil Nadu" International Journal of Informative & Futuristic Research, Vol. 4, ISSN 2347-1697.pp. 8129-8139.

[10] P. Stanley David Pichai (2019), "A Study on the Socio – Economic Status of Saltpan workers In Tuticorin District" Journal for All Subjects, Vol. 08, ISSN 2249-849X pp.1-7.

[11] Johnson Cheerian[1], Zile Singh[2], Joy Bazroy[2], Anil J. Purty[2], Murugan Natesan[2],(2019), "Knowledge, attitude and practices regarding work related hazards among salt workers in Marakkanam, Tamil Nadu" International Journal of Community Medicine and Public Health, Vol.6, ISSN 2394-6040, pp. 4629-4634.

[12] Ashok Panigrah[1], Suganta Sarkar[2] (2024), Suman Kalyan Chowdhury[3], "An assessment of the performance evaluation of the salt industry in India with special reference to the state of Gujarat" Journal of Management Research and Analysis, Vol.11, ISSN 2394-2762, pp.229-237.

[13] HeruSusanto[a], NurRokhati[a,] Gunawan W. Santosa[b], (2015)"Development of Traditional Salt Production Process for Improving Product Quantity and Quality in Jepara District Central Java , Indonesia" International Conference on Tropical and Coastal Region Eco-Development, Vol. 23 pp.175-178.

[14] Dr. S. Naresh[1], Dr. R. Rameshbabu[2], (2017), "A Study on Import and Exprot of salt in India" International Journal of Pharmaceutical Science Review and Research, Vol.27, pp. 155-156.
[15] G. Arumugasamy[1], R. Sam Renu[2], (2013) "Problem and Prospects of Salt Industry in Kanyakumari District" Indian Journal of Applied Research, Vol.3, ISSN 249-55X, pp.243-246.
[16] Dr. B. Nagaraja, (2015) "Economics of Salt Production in India: An Analysis" Indian Journal of Applied Research, Vol.5, ISSN 2249-555X, pp. 284-288.
[17] Fathor AS[1], Fatimatual Fatmariyah[2], (2023), "Exploration of salt farmers' E-Marketing Strategy: A Lesson for Madura Island, Indonesia" Vol.13, ISSN 2146-4405, pp.25-32.
[18] Tilman B. Drueke ,(2007), "Man need salt to survey" research article published in European Salt Producer Association pp. 01-02 website: www.eusalt.com
[19] W. Sauren Wolchock (2006), Impact of Salt Production on Pemba, research article published in Independent Study Project (ISP) Collection, pp. 01 to 67. Website: https://digitalcollections.sit.edu
[20] R. Banumathi[1] and Dr. S Nadarajan[2] (2015), "Marketing Strategies and Practices with reference to salt industries in Tamilnadu, India", International Journal of Management, Vol.6, ISSN 0976-6502, pp.34-37.
[21] M. Satya Narayan Misra (2014), "Salt Manufacture in Balasore", research article published in Odisha Review Vol. 05, pp. 69-76.
[22] Venketesh mannar and Rizwan Yusufali,(2013), Salt production and trade in Africa, research article published in ,Idd newsletter, Micronutrient Initiative; Global Alliance for Improved Nutrition (GAIN). , Vol. 41, pp. 20-21 researchgate, https://www.researchgate.net/publication/266160091.
[23] Annual salt report, 2022-23, Department for promotion of industry and international trade, Ministry of commerce and industries, Indian Salt commissioner office, https://saltcomindia.gov.in.