



## A Study on Health Hazard of Salt Workers in Tamilnadu Coastal Areas

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### ABSTRACT

In India the Tamil Nadu is the second largest producer of salt, next only to Gujarat. The salt in the state is produced from salt pans along the seacoast. Tutucorin, Ramanathapuram and Nagapattinam are the three major salt producing districts, accounting for about 85 percent of the state's salt production. An estimated 30,000 acres of land is used for salt production in the three districts, it has providing economic for large numbers of people along the coast. It is only sources of revenue to them; Salt workers working in different clusters along the seacoast are one of the most disadvantaged groups in the state. Most of the workers as wage earners in salt pans and do not have any influence within the salt value chain. They do not have access and control over the resources associated with salt production, mainly the salt pans. Thus, they are inexorably caught in a vicious cycle of debt and dependence that ensures that they remain economically poor and socially backward. Those that were affected by the Indian Ocean Tsunami 2004 were reportedly worse off as many lost several months of production as the pans were flooded (mainly in Nagapattinam District). There has been very little systematic and grass root level study done to understand and assess the situation of salt workers in the study districts of Tamil Nadu.

**Keywords:** Occupational health problems, prevalence, salt-workers, symptoms.

### INTRODUCTION

About 200000 men and women are engaged in the production of salt in Tamilnadu alone, which is an important unorganized sector. The salt workers are exposed to adversities of environmental conditions as well as salt in the environment. There is a lack of awareness about their occupational health problems. Government of India as well as Tamilnadu government has been making continuous efforts to educate salt manufacturers, salt workers in general and small salt producers in particular for improving the quality of salt to meet the stringent standards of industrial and edible salt, to compete in the domestic and international market and also to make it sure health safety of workers. The previous research study reveals that most of the Salt workers in Odisha, Andhra Pradesh, and northern part of Tamilnadu, Karnataka, Mumbai and south Gujarat still follow the old traditional methods of producing salt. It is seen that these salt works are mostly constructed on seashore land located in difficult climatic conditions.

The salt workers have a definite mindset about the way salt is to be produced and are not willing to change it. Hence it would have been affected their health, they are still following primitive methods and layout of the Salt works is out dated. It is necessary to demonstrate before them to produce good quality salt with high yield per acre under different climatic conditions. SCO (Salt Commissioner's Organization) has set up Model Salt Farms (MSF) in Rajasthan, Odisha and Tamilnadu in collaboration with Central Salt and Marine Chemicals Research Institute (CSMCRI), Bhavnagar and the concerned State Governments (Socio-Economic Status –

Dec 07). These MSFs have successfully demonstrated the technicalities of production of good quality salt with protection of human health. Therefore, it is felt that if proper training is imparted to salt workers and expose them to the modern technologies, they will be able to produce good quality salt in a cost effective manner with good health conditions.

#### Statement of the Problem

Health related problems to human in nature, but artificial health problem is avoidable from working environment through the technological development and proper machines handling. Looking at the large number of salt workers exposed to salt and facing occupational health problems like prevalence of ophthalmic symptoms, dermatological symptoms like headache, giddiness, breathlessness, muscular and joint pains.

The ophthalmic problems were most common, probably due to irritation by direct sunlight and its glare caused by salt crystals to brine as well as irritation, traumatic ulcers, dermatitis, muscular and joint pains, headache and giddiness were other more common symptoms to salt workers. There is a need for developing a mechanism for prevention of these problems to them. Hence this paper is made an attempt to study identify work-related health problems experienced by the salt workers in the study area.

#### Objectives of the Study

1. To find the prevailing working condition of the salt workers and
2. To analyze the health problems of the salt workers.



3. To evaluate the safety and welfare measures of salt workers

### Sampling Design

The present study is based on the primary data, collected from the Tutucorin, Ramanathapuram and Nagapattinam, the study area sample method is used simple random sampling for this study. The researcher would be selected all three areas under census method. Out of the three strata, the total population is 198621. Hence researcher would be selected as a sample respondent is 598 by using Rao calculator (The Survey system) to identify the sample size at 99 percent confident level at margin of one percent, the respondents selected in order to assess their opinion towards health hazard.

### Limitations of the Study

During the data collection, responses on accident data, safety infrastructure from some manufacturers were not ready to offer details, at times incomplete and regular follow up also were not very effective in getting accurate details as information was closely watched over being a sensitive matter. Only major salt producing districts have been taken into consideration, this limitation can be studied in the future studies.

## ANALYSIS AND DISCUSSION

### Health Hazard of Salt Workers

Table 1 shows the Garret value equal to calculated value. Firstly the Garret ranks are calculated by using appropriate garret ranking formula. Then based on the Garret ranks, the Garret table value is ascertained. Percent position =  $100 (R_{ij} - 0.5) / N_j$ ,  $R_{ij}$  - Rank given for 1<sup>st</sup>

item by  $j^{\text{th}}$  sample respondents,  $N_j$  – Total rank given by the  $j^{\text{th}}$  sample respondents.

Table 1 explicates the Garret scores for the health hazard of salt workers.

The calculated value registered between 8.34 and 91.67. The table value ranges between 23 and 77.

### Health Hazard of Salt Workers

Day to day life of the salt workers are facing various health hazards like salt crystals create brine stress, physical stress, due to sunlight glare reflected by salt crystals through that it would affect eyes and so on.

Table 2 explains the health hazard of salt workers.

Table 2 portrays the Garret scores. The highest score is awarded to the factors: "Ophthalmic symptoms" is ranked as first health problem, followed that "dermatological symptoms". The least score is awarded to "joint pains". Hence it is inferred that "Ophthalmic symptoms" is the major health problems to the salt workers.

### Salt Workers Opinion about Awareness on Health Issues – Kandas Concordant Co efficient Test

India is one of the major producers of salt accounting for eight percent of the world's salt production. Salt is produced by solar evaporation of sea/subsoil/ inland brines. The salt industry provides employment to more than 1.5 lakh workers.

In tamilandu it is a source of livelihoods of Tutucorin, Ramanathapuram and Nagapattinam area, other than fishers.

**Table 1:** Health Hazard of Salt Workers

S. No.	Calculation	Calculated Value	Garrets Table Value
1	$100 (1 - 0.5) / 6 = 50 / 6$	8.34	77
2	$100 (2 - 0.5) / 6 = 150 / 6$	25	63
3	$100 (3 - 0.5) / 6 = 250 / 6$	41.67	55
4	$100 (4 - 0.5) / 6 = 350 / 6$	58.34	46
5	$100 (5 - 0.5) / 6 = 450 / 6$	75	37
6.	$100 (6 - 0.5) / 6 = 550 / 6$	91.67	23

Source: Primary Data.

**Table 2:** Health Hazard of Salt Workers

Factor	1	2	3	4	5	6	Garret Score	Garret Rank
Ophthalmic symptoms	1540	1890	1100	1840	1480	92	7942	3
dermatological	7700	315	275	1380	259	161	10090	1
Headache	770	3150	4950	92	37	23	9022	2
Giddiness	770	3150	770	230	185	1610	6715	5
breathlessness	1001	504	1045	3496	740	414	7200	4
joint pains	77	693	330	46	2997	1242	5385	6

Source: Primary Data



**Table 3:** Salt Workers Opinion about Awareness on Health Issues

Kendal's concordant co efficient Test			
Health hazard	Mean Rank	Chi-square	P Value
Eye problems	12.96	721.41	<0.003**
Fungal infection in the feet	14.20		
Allergic contact dermatitis	13.01		
Photo-dermatitis	14.2		
Toxin metanosis	7.41		
Fungal infection in different parts of the body due to moist air.	9.54		
Poor night vision	7.98		
Headache	6.36		
Joint pains	7.93		
Toxin Breathlessness	9.32		
illness	6.61		
chronic diseases	4.40		
fatal accidents	12.98		
Low vision	6.46		

Note: \*\* denotes that the significance @ 1 percent level. Source: Primary Data.

**Table 4:** Problems Faced by the Salt Workers - Multiple Regression

1	Dependent variable	Health related problems
2	Independent variables	Ophthalmic symptoms (X1) 1. Dermatological (X2) 2. Headache (X3) 3. Joint pains (X4) 4. Breathlessness (X5)
3	Method	Enter method
4	Multiple R	0.912
5	R square value	0.894
6	Adjusted R square value	0.899
7	F value	3.094
8	P value	<0.001*

Source: Primary Data.

Table 4 shows that problems faced by the salt workers, It shows regression and f value.

**Table 5:** Problems Faced by the Salt Workers - Multiple Regression

Variables	Un-standardized Co efficient (β)	Standard Error (β)	Standardized Co-efficient (β)	T Value	P Value
(Constant)	0.887	.950		.934	.352
X1	0.070	.028	-.227	2.504	0.014**
X2	0.151	.062	.269	2.436	0.017**
X3	0.385	.132	.276	2.911	0.004**
X4	0.142	.079	-.171	1.792	0.006**
X5	0.565	.232	.176	2.731	0.001**

Source: Primary Data.

Based on the opinion of the salt workers, the researcher has applied Friedman test. This is a non – parametric test. This test can be used to find out the mean ranking, thereby which one is in the top health related problems affected under the fourteen problems for affecting workers. The ranks were assigned and on the total scores are found out by using SPSS packages.

Table 3 shows that P value is less than 0.01; the null hypothesis is rejected at one percent level of significance. Hence it is concluded that there is significant difference between mean ranks towards the awareness about health related issues. Based on the mean rank, it is found that eye problem got first rank followed by fungal infection in the parts of body and the least rank was given by the respondents' low vision.

Through the Friedman test it is found that some of the health awareness got maximum mean rank for highest, like eye problem, fungal infection. The government and manufacture wants to concentrate on some other area also to create awareness.

#### Problems Faced by the Salt Workers - Multiple Regression

The salt production in Tutucorin, Ramanathapuram and Nagapattinam is by the traditional method of evaporation of brine (water with high concentration of salt) filled in the salt pans.

The working condition of labor is no modern equipments being used for production. In connection that the salt production, meanwhile the salt workers are involving production they are affected various health related issues. Table 4 explains problems faced by salt workers.

Table 5 elucidates that there are four independent variables and one dependent variable rotated in multiple regression analysis. The problems faced by the salt workers are many.

From the table 4 the P value 0.001 is found to be significant at one percent level. Hence the null hypothesis is rejected and the values that are estimated are not a mere theoretical construct.

#### Recommendations

- Government as well as producers has to create more awareness amongst the workers of the salt industry regarding different hazards of the work place and action required to be taken for safe working.
- The training needs of the workers in connection with safety management should be reviewed at regular intervals and accordingly the training inputs must be given in a planned and phased manner.
- There has been no scientific study on incidence of occupational diseases in the Indian Salt Industry.
- Both central and state governments are ready to give training to salt workers to inculcate modern salt technology amongst salt producers who are hitherto

producing salt with the ancient methods sure make use of it for their better meant.

- Adoption of modern technology would lead to improvement in terms of quality and quantity of salt with safest manner.
- WHO (World Health Organization) come forward and recommended to salt producer to offer safety instruments.
- Medical health surveillance must be adopted by the salt manufacturing units some periodic interval. The medical check must be carried out at the time of induction of worker and at regular intervals.

#### CONCLUSION

Working environment in salt industry exposes the working population to direct contact with inhalable salt dust; salt crystals give direct impact on brine, physical stress, direct bright sunlight and glare due to sunlight reflected by salt crystals and brine surface.

However, the extreme weather and hard labour conditions in the salt workers cause lot of health issues among the salt workers.

There must be need for modernization and well trained mechanization of salt works and use of personal protective equipments to overcome health problem of salt workers.

In this research study concluded that prevalence of hypertension in salt workers was not found to be different from a similar group of workers not occupationally exposed to salt. Hence this study highlights the need for developing provision for prevention of occupational health problems in workers engaged in salt production of these three districts.

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