RESEARCH PAPER

The Triple Burden: An Analysis Of Socio-Economic, Health Status And Environmental Effects On Salt Pan Workers In Tuticorin District, Tamil Nadu

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ABSTRACT
With important psychological and socioeconomic ramifications, salt is essential to human activity. India is the world's third-largest producer of salt, which greatly contributes to the labour force in the unorganized sector especially in regions like Tuticorin district. The socioeconomic circumstances, health issues, and environmental effects that are experienced by salt pan workers in the region are examined through this study. Stratified random sampling was used to gather data from 200 respondents employing a mixed-methods technique. Gender, environmental awareness, and health consequences are significantly correlated, as revealed by statistical studies such as Simple Percentage Analysis, Correlation, Chi-square and independent sample "t" test. Compared to female employees, male workers exhibit more awareness of and involvement in social welfare programs. Additionally, there is a positive link (p-value = 0.002) between weekly income and savings. The study comes to the conclusion that salt pan workers' health and financial security are significantly impacted by environmental conditions. To improve the general well-being of salt industry workers, the study suggests creating specialized healthcare facilities, enforcing employer-provided medical and sanitary facilities, and putting in place government-led welfare and health awareness initiatives..

Keywords: Climate change impact, Environmental degradation, Health implication, Occupational hazards, Salt pan workers, Socio-demographic analysis
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INTRODUCTION

Salt is essential to human activity. According to Sivagamashunmuga Sundari et al. (2020), salt has a significant psychological impact on human development and population growth. India is the third-largest producer of salt in the world out of 91 nations, with 1,147.97 metric tonnes (MT) produced in 2019 at a 3 percent annual growth rate. China is the world's top producer of salt, followed by the United States and Australia (The World Atlas, 2017). Australia (1,206.58 metric tonnes) and Italy (1,107.72 metric tonnes) surpassed the Philippines (Bartolome 2022). Rosita (2014) estimated 230 million tonnes of salt are produced annually worldwide. In India, the salt pan industry is a long-standing and customary sector. The salt pan industry offers employment opportunities to unskilled and semi-skilled labourers. It was crucial in giving employment opportunities to the economically disadvantaged and illiterate segments of society whose standard of life is extremely low (Robin Brahma et al., 2022). About 51647 salt workers from the unorganised sector were employed in the salt pan industry in Tuticorin district (Henry Pandian et al., 2021). The majority of salt workers are employed on a contract, subcontract, or daily salary basis. Mayuri Banerjee Bhattacharya (2017), Pimpan Silpasuwan et al. (2019), and Sonia Soni (2021) uncovered that workers in traditional salt businesses face low pay, inadequate accommodation, lack of utilities, and lack of health security. Numerous studies have shown that salt workers were dealing with a variety of health conditions, including as epidemiological and ocular problems. Sinus and mucous membrane infections can result from ophthalmic issues brought on by inflammation from sunlight and salt particles. Skin allergies and rashes can lead to dermatological infections. Salt workers also frequently experienced respiratory conditions as wheeze and asthma (Rajaram and Das 2013; Patel and Khandekar 2008; and Chatterjee & Banerjee 2010). According to a study by Randy Joy et al. (2023), the quantity and quality of salt have decreased during the rainy season as a result of climate change. Titaporn Luangwilai1 et al. (2021) have studied and found that salt is gathered every year from January to May during the summer. In light of this, the current study

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attempts to evaluate the triple load that salt pan workers in Tamil Nadu's Tuticorin region endure.

REVIEW OF LITERATURE

Apambilla Roland et al. (2019) examined how climate change affects the production of salt. The outcomes of the study showed that there is a relationship and an impact between temperature and rainfall fluctuation and the amount of salt produced. The medium-to-long-term viability of the salt industry, as well as its adoption and mainstreaming into the strategy for adapting to climate change as part of a broader national adaptation policy, are imperatives, according to the author. To mitigate the effects of climate change, investments in effective infrastructure, technologies, and storage facilities are also necessary for the production and storage of salt. These investments help to prevent production losses and leaks.

Norma (2022) analyzed the ergonomic assessment of salt pan workers in Occidental Mindoro. The salt pan workers face multiple health issues like shoulder injuries, Patellofemoral pain, and elbow injuries. The findings of the study demonstrated that the salt workers' pain was caused by salt-related tasks which involve gathering salt and adding brine to containers. Furthermore, it has been discovered that engaging in risky salt workers' responsibilities might cause pain in some body regions, especially after years of experience. The author emphasized the need for safety precautions because salt workers are likely to work in hazardous environments and in climate-related conditions that could endanger their social and health security. Moreover, to draw attention to these dangerous health circumstances, awareness programs on health-related issues and salt pan working conditions may be conducted. n

Therefore, a significant research gap exists in understanding the morbidity among the salt pan workers and salt industries affect the environmental issues. Furthermore, only some of the difficulties have been addressed in the existing literature at work site such as use of personal protective equipment, wages, long work hours, drinking water issues, and lack of awareness of health care.

OBJECTIVES AND RESEARCH QUESTIONS

Human health and Environmental issues are closely linked to the state of the salt pan Industry. Good quality natural environment provides basic needs, in terms of clean air, water and good labour and material inputs for production. It is an inevitable responsibility to think about the environment and its relationship to the health and growth of the economy. In this manner, the present work tends to seek answers for the following questions: a) how does the environmental factor affect the salt pan Workers? b) What are the causes of environmental hazards in the salt pan Industry? and c) What are the health impacts of salt pan workers influenced by the salt pan Industry?

Having understood the need and necessity of the problem, the present study attempts to examine the socio-economic conditions of salt pan workers and to discover the factors affecting environmental degradation's effects on the health of the salt pan workers. Also, this paper attempts to analyze the physical problems caused by occupational hazards and environmental problems and awareness of social welfare schemes to the salt pan workers. The outcome of this study is useful to the policymakers for developing a better working environment through policy decisions for the welfare and wellbeing of salt pan workers of salt pan industry.

METHODS AND MATERIALS

RESEARCH DESIGN

The health and environmental circumstances of the salt pan workers in the Tuticorin district have been evaluated using a combination of quantitative and qualitative methodologies. The Tuticorin district's salt pan workers' health and environmental degradation were the subjects of the investigation. Using a stratified random selection technique, the researcher selected 200 respondents from the study region. Based on the total number of salt pan workers in the study area, the sample was split equally, with 50 respondents from Veppalodai, 50 from Palayakayal, 50 from Mullakaadu, and 50 from Vaipar, respectively. The study collected primary data from the chosen salt pan workers in the study district using a pre-tested and well-structured interview schedule. For analytical purposes, the study results have been empirically examined and further validated using basic percentage analysis, correlation, multiple regression, t' test, and chi square test.

SAMPLING DESIGN

This study is based on primary data collected from Veppalodai, Palayakayal, Mullakaadu and Vaipar in Tuticorin district of Tamil Nadu. Totally 200 samples were selected for the current study from a total of 51,647 salt pan workers by grouping them into five strata: pumping, racking, salt collection, salt bed casting, and salt heaping. The study selected four locations in the Tuticorin district where there are a lot of salt pans, high levels of salt production, and a significant impact on female workers in the salt pan business. Higher salt yields and a sizable labour population made up of both male and female workers are characteristics of these areas, which are recognized as significant salt producing zones. It is also highlighted that these regions are renowned for having a higher capacity to produce salt, with each salt pan producing nine to eleven tonnes per salt bed in the summer.

RESULTS AND DISCUSSION

The socio demographic characteristics of the salt pan workers in Tamil Nadu's Tuticorin district are described in Table 1. A 59 percent of the workers in the chosen salt pan region were men, with the remaining 41 percent being women. While 66.5 percent of workers are between the ages of 35 and 44, 15.5 percent were between the ages of 55 and 64, 8.5 percent were between the ages of 25 and 34, 6 percent were between the ages of 65 and over, and the least number, 3.5 percent, were between the ages of 45 and 54. In the salt pan region, 69 percent of the workers were married, and the remaining 31 percent were widowed. In contrast, 93 percent of the sample households have two to five individuals, while the remaining households have five

to seven members. It reveals that the majorities of salt pan workers 86.5 percent live in rural areas, while the smallest percentage 13.5 percent live in urban areas. According to this study, the majority of respondents (28 per cent) earn monthly income more than Rs.20,000, 18 per cent of workers earn Rs.14,001-Rs.16,000, monthly income of 16 percent of respondents lies between Rs,8001 and Rs.10,000, 15 per cent of workers earn between Rs,10,001and 12,000, 12 per cent of workers earn monthly income between Rs,12,001 and Rs.14,000 and the remaining 12 per cent of the respondents earn less than Rs.8000. About 58.5 percent of workers have no other source of income during the lean season. About one-fourth (26 percent) of the salt pan workers rely on their families for support, while 15.5 percent of them get income from other sources. While 30 per cent of workers monthly expenditure was more than Rs.20, 000, 21 per cent workers have monthly expenses between Rs.8001 and Rs.10000, 16 per cent of workers have monthly expenditure between Rs.10, 001 and Rs.12, 000, 15 per cent of workers have monthly expenses of Rs. 14,000 – Rs.16, 000 and the least 12 per cent of respondents have monthly expenditure of Rs.12,001 – Rs.14,000. Conversely, 2 per cent of workers have savings between Rs.4001- Rs.5000, 26.5 per cent of workers have savings less than R.1000, 13.5 per cent of workers have savings between Rs.1001- Rs.2000 and 13.5 per cent of respondents have savings between Rs.2001-Rs.3000, 11.5 per cent of workers have savings lying between Rs.3001-Rs.4000, and 33 per cent of workers have no savings. Additionally, 49.5 percent of workers had no debt, 33 percent owed less than Rs. 10,000, and 17.5 percent owed between Rs. 10,000 and Rs. 20,000. During the winter season (December to March), 42 percent of workers borrowed money from money lenders due to "downtime," 17 percent borrowed money from private banks, 8.5 percent borrowed money from friends, and 32.5 percent had no debt.

TABLE -1 SOCIO DEMOGRAPHIC FACTORS OF THE SALT PAN WORKERS IN TUTICORIN DISTRICT.

Indicators	Cluster/Grouping	Frequencies	% Distribution
Gender	Male	118	59.0
	Female	82	41.0
Age	25-34	17	8.5
	35-44	133	66.5
	45-54	7	3.5
	55-64	31	15.5
	65 and over	12	6.0
Marital Status	Married	138	69.0
	Widowed	62	31.0
Family Members	2-5	186	93.0
	5-7	14	7.0
Residential Area	Rural	173	86.5
	Urban	27	13.5
Monthly Income	Less than 8000	22	11
	Rs.8001-Rs.10000	32	16
	Rs.10,001-Rs. 12,000	30	15
	Rs.12,001-Rs.14000	24	12
	Rs.14,001 – Rs. 16,000	36	18
	More than 20,000	56	28
Income from other sources	Alternate business	31	15.5
	Family support	52	26.0
	No additional Income	117	58.5
Monthly Expenditure	Less than 8000	12	6
	Rs.8001-Rs 10000	42	21
	Rs.10001-Rs.12000	32	16
	Rs.12001-Rs.14000	24	12
	Rs. 14,001 – Rs. 16,000	30	15
	More than 20,000	60	30
Monthly Savings	Less than 1,000	53	26.5
	1,001-2000	27	13.5
	2001-3000	27	13.5
	3001-4000	23	11.5
	4001-5000	4	2
	No savings	66	33
Debt	No debt	99	49.5
	Less than 10,000	66	33.0
	10,000-20,000	35	17.5

Sources of Debt	Friends	17	8.5
	Money Lenders	84	42.0
	Private Bank	34	17.0
	No debt	65	32.5

Source: Primary data (Field Survey)
Number of Respondents: 200

The environmental risks and deterioration of the salt pan are shown in Table 2. There are 42.5 percent workers indicated soil salinity and salt pan degradation, 41 percent stated ecological imbalance and habitat destruction, and 16.5 percent of workers pointed out that the least amount of harmful chemical exposure in the salt pan area. Workers must transport drinking water from home to work because of the increased saline of the soil and the high amount of saltiness in drinking water. In addition, the surrounding area is unsuitable for development and farming owing to the elevated salinity. As a result, 41 percent saw a fast reduction due to increased pollution, 29.5 percent saw a gradual improvement with conservation efforts, 20.5 percent saw periodic swings depending on monsoons, and at least 18 percent saw a decline as a result of climate change. In contrast, salt production was impacted, as revealed by 27 percent, by changed precipitation patterns, 32.5 percent opined greater storm surges, 24 percent opined rising sea levels, and 16.5 percent pointed out temperature changes. However, 51.5 percent of workers revealed that coastal areas were affected by saline intrusion, 24 percent told that inland areas had problems with soil erosion, and the remaining 18.5 percent had pointed out varying susceptibility depending on geographical features and the least amount of proximity to industrial zones.

TABLE – 2 ENVIRONMENTAL RISKS AND DEGRADATION AND IMPACT OF CLIMATE CHANGE ON ENVIRONMENTAL CONDITIONS

Indicators	**Cluster/Grouping**	**Frequencies**	**% Distribution**
Environmental Risk and degradation	Exposure to hazardous chemical	33	16.5
	Soil Salinity & degradation	85	42.5
	Ecological imbalance and habitat destruction	82	41.0
Environmental condition	Gradual improvement with conservation efforts	41	20.5
	Decline due to climate change	36	18.0
	Sharp deterioration with increased pollution	82	41.0
	Periodic fluctuations based on monsoons	41	20.5
Impact of climate change on environmental conditions	Altered precipitation patterns affecting salt production	54	27.0
	Increased storms surges impacting salt pans	65	32.5
	Rising sea levels causing and loss	48	24.0
	Shifts temperature affecting salt yield	33	16.5
Susceptible to environment	Coastal areas due to saline intrusion	103	51.5
	Inland areas with soil erosion issues	48	24.0
	Proximity to industrial zones	12	6.0
	Varied susceptibility based on geographical factors	37	18.5

Source: Primary data (Field Survey)
Number of Respondents: 200

The impact of the environment on the health of the sample respondents in the research region is shown in Table 3. Eighty-one percent of respondents in the salt pan area said that climate change and salt production had an impact on their environment, while 10.5 percent said that groundwater overuse was the primary issue in the study area. The lowest percentage of respondents (8.5 percent) said that waste management from salt production was the main environmental issue in the sample area. In terms of health problems, 42.5 percent of workers had skin allergies, 26.5 percent had waterborne illnesses, 17.5 percent had respiratory issues, primarily from exposure to chemicals and salt, and 18.5 percent had a combination of environmental factors that had an impact on their health. Regarding specific health effects, 50.5 percent of workers reported hypertension and kidney problems brought on by salinity, 35 percent reported multiple health effects from pollutants, 8.5 percent reported heavy metals (lead, mercury) with neurotoxin effects, and 6 percent reported pesticides and chemicals causing skin and respiratory problems. Finally, a greater percentage of workers (58.5percent) said that there was a weak correlation between respiratory difficulties and climate variance, but a small percentage (3.5 percent) firmly believed that there was a direct correlation between chemical exposure and skin concerns. Overall, the results showed that the primary

environmental problems impacting workers' health were chemical exposure, salt, and climate change.

TABLE – 3 ENVIRONMENTAL IMPACTS ON HEALTH

Indicators	Cluster/Grouping	Frequencies	% Distribution
Environmental Impact on Health	Poor wastage management practices and chemical spillage	17	8.5
	Over exploitation of underground water resources	21	10.5
	Interactions between climate change and salt production	162	81.0
Salt pan affect the health of the salt workers	Increased risk of respiratory ailments due to airborne particles	35	17.5
	Skin conditions and allergies from exposure to salt and chemicals	85	42.5
	Water borne diseases from contaminated water resources	53	26.5
	Interplay of environmental factors with health implications	27	18.5
Health Impacts	Heavy metals (lead, mercury) with neurotoxin effects	17	8.5
	Pesticides and chemicals leading to skin and respiratory issues	12	6.0
	Salinity causing hypertension and kidney problems	101	50.5
	A mix of pollutants with multifaceted health impacts	70	35.0

Source: Primary data (Field Survey)

Number of Respondents: 200

The correlation between monthly income of respondents and their savings in the research region is displayed in Table 4. The correlation analysis reveals that monthly income has a weak positive relationship with monthly savings (r = 0.202). The significance level (p = 0.004) shows that this relationship is statistically significant at the 1 percent level. This indicates that higher income is associated with slightly higher savings, although the strength of the relationship is low. As a result, the alternative hypothesis is accepted and the null hypothesis is rejected (p value = 0.005>0.004).

RESULTS IN RELATIONSHIP BETWEEN MONTHLY INCOME AND SAVINGS

TESTING OF HYPOTHESIS:

H_0: There is no relationship between monthly income and monthly savings

H_a: There is a relationship between monthly income and monthly savings

Table – 4 Relationship between Monthly income and savings

Variables	Pearson Correlation (r)	Sig (2 tailed)	N (Sample size)	Results
Monthly income & Monthly savings	0.202	0.004	200	Weak, Positive and significant correlation

** Significant at the 1 level

CHI – SQUARE TEST OF ASSOCIATION BETWEEN GENDER AND AWARENESS OF SOCIAL WELFARE SCHEMES

This study's main goal is to use the chi-square test to look into possible relationships between category data. The research produced important insights that greatly improved the compensation of the underlying phenomena by carefully examining frequencies and proportions within different categories.

The Chi – square test can be mathematically expressed as

$$\chi^2 = \left[\frac{(O_1 - e_1)^2}{e_1} + \frac{(O_2 - e_2)^2}{e_2} + \frac{(O_3 - e_3)^2}{e_3} + \ldots\ldots\ldots + \frac{(O_k - e_k)^2}{e_k}\right]$$

$$\chi^2 = \sum \frac{(O_i - E_i)^2}{E_i} \quad k = 1$$

Where,

χ^2 = Chi squared

O_k= Observed values

E_k = expected values

Hypothesis:

H_0: There is no association between gender and awareness of social welfare schemes

H_1: There is a association between gender and awareness of social welfare schemes

The association between gender and knowledge of social welfare programs is examined in Table 5. A highly

significant connection at the one percent level ($p = 0.05 > 0.000$) is indicated by the Pearson chi-square test, which returns a value of 20.768 with one degree of freedom and a p-value of 0.000. The null hypothesis was thus disproved. Additionally, the contingency coefficient value of 0.307 indicates a moderate relationship between social welfare system awareness and gender. Additionally, compared to female employees, who often show lower levels of awareness and participation, male employees have higher rates of participation and awareness.

TABLE – 5 ASSOCIATIONS BETWEEN GENDER AND AWARENESS OF SOCIAL WELFARE SCHEMES

How aware are salt pan workers of these social welfare schemes and policies?							
Variables	Respondents	Very aware, with high participation rates	Limited awareness and low participation	Pearson chi-square test	Degrees of freedom	Contingency co-efficient value	p-value
Gender and Awareness of social welfare schemes	Male Female	26 0	92 (118 + 82) 82 (200)	20.768	1	.307	.000

Note: p value = 0.000<0.05 (1% level of significant)

HYPOTHESIS TESTING: t - TEST

H_0: There is no significant difference between gender perception in environment and health impacts of salt pan workers.

H_a: There is a significant difference between gender perception in environment and health impacts of salt pan workers.

The gender disparities in salt pan workers' perceptions of the effects on the environment and their health are shown in Table 6. The hypothesis was tested using the independent "t" test. According to the group statistics, the mean score for the statement "Environmental degradation in salt pans affected the health of the workers" was 2.10 for male workers and 2.73 for female workers. This suggested that compared to male workers, female workers were more impacted by environmental degradation. The average score for the variable "Salt pans and their health implications" was 2.91 for male employees and 3.43 for female employees. Notably, compared to male workers, female workers had more health issues associated with salt pan activities. The differences between the male and female groups were not equal, according to the Levene's test result of 11.264 at a significance level of 0.001. The null hypothesis was thus disproved. There was a statistically significant difference between male and female workers with regard to environmental degradation and health implications, according to the t-test result ($t = -5.092$, $p = 0.000$). The fact that female employees were more impacted than male employees was confirmed by the mean difference of -0.630. The substantial difference between the two groups was further supported by the fact that zero was not included in the 95 percent confidence interval, which ranged from -0.874 to -0.386.

TABLE -6 INDEPENDENT SAMPLE T-TESTS – HYPOTHESIS TESTING

Group Statistics					
Variables	**Gender**	**N**	**Mean**	**Std. deviation**	**Std. Err Mean**
Environmental degradation in salt pans affect the health of the workers	Male	118	2.10	.900	.083
	Female	82	2.73	.832	.092
Salt pans and their health implications	Male	118	2.91	.987	.091
	Female	82	3.43	.498	.055

Independent sample t-test									
Variables	**Levene's test for Equality of Variances**					**T-test equality variances**		**95 % Confidence interval of the Difference**	
	F	**Sig**	**t**	**df**	**Sig(p value)**	**Mean difference**	**Std. Err. Difference**	**Lower**	**Upper**
Equal variances assumed	11.264	.001	-4.897	198	.000	-.520	.118	-.753	-.287
Equal variances			-5.092	182.650	.000	-.630	.124	-.874	-.386

not assumed									

Note: (0.05> 0.000, 1 percent level of significant)

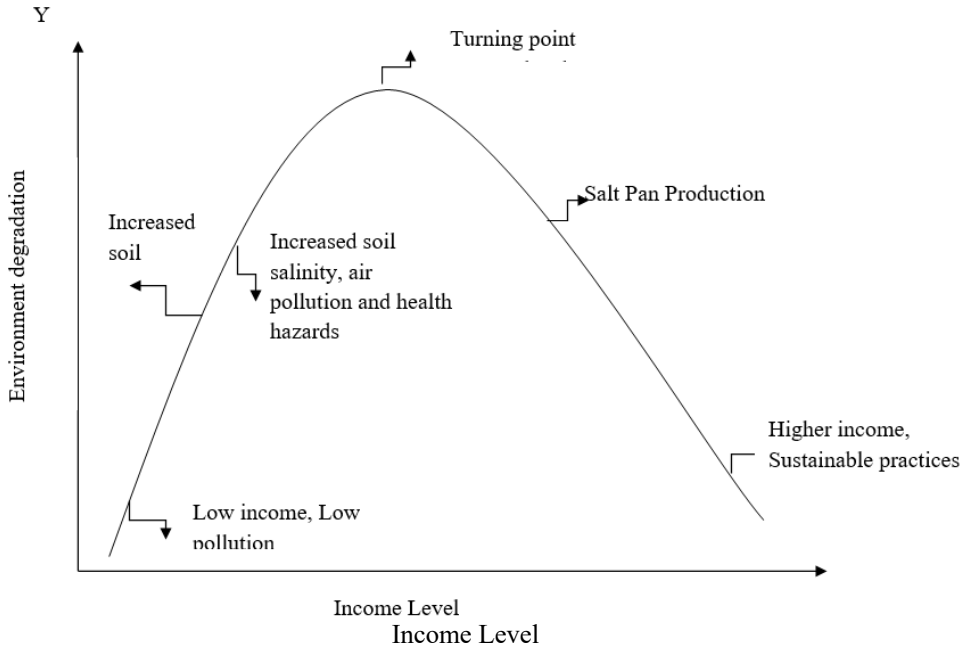
THEORETICAL FRAMEWORK: ENVIRONMENTAL KUZNETS CURVE (EKC) AND ITS RELEVANCE TO THE SALT PAN INDUSTRY

INTRODUCTION TO ENVIRONMENTAL KUZNETS THEORY

Using the original Kuznets curve, which examined income inequality and development, Grossman and Krueger (1991) first presented the idea in their study of commerce and the environment. An important hypothesis in environmental economics that explains the dynamic relationship between economic expansion and environmental degradation is the Environmental Kuznets Curve (EKC). An inverted U-shaped curve represents this relationship.

ENVIRONMENTAL KUZNETS CURVE DIAGRAM FOR SALT PAN ECONOMY IN TUTICORIN DISTRICT

Below is a customized diagram representing the Environmental Kuznets Curve theory in the context of the salt pan industry of Tuticorin district.



Income Level

ENVIRONMENTAL KUZNETS CURVE APPLIED TO SALT PAN WORKERS: ENVIRONMENTAL KUZNETS CURVE APPLIED TO SALT PAN INDUSTRY

Environmental Kuznets Curve Phases	Salt Pan Context
Phase:1 Initial Growth	Manual salt extraction, low income, high environmental degradation, (heat, salinity, eye damage) no regulations.
Phase:2 Turning point	Government schemes, improved wages, awareness, ESI, insurance, protective equipment, NGOs involvement.
Phase:3 Sustainable phase	Technological upgrades, health clinics nearby saltpans, eco-friendly practices, and better monitoring leading improved environmental and health outcomes.

Under the correct circumstances, salt pan development can take transition from being environmentally detrimental to becoming sustainable, as shown by the Environmental Kuznets Curve (EKC) model. Notably, workers' health is impacted by environmental degradation (such as heat, salinity, and salt dust), which lowers salt productivity and raises medical costs. This cycle slows down development and has a detrimental effect on income.

POLICY IMPLICATIONS FROM ENVIRONMENTAL KUZNETS CURVE

To help the Tuticorin salt industry transitions to the third phase of environmental Kuznets curve, the following are necessary.

1. Installation of shaded structure at work sites.
2. Routine medical camps and occupational health check-ups.
3. Proper waste and brine management.
4. Efficient salt harvesting equipment.
5. Community awareness programs.
6. Enforcement of labour and environmental laws.

According to the Environmental Kuznets curve, these actions will promote economic growth without sacrificing the environment. Further this theory came out with the fact that the region may attain both economic development and environmental well-being for its salt pan workers through inclusive policies, eco-conscious investment, and smart planning.

CONCLUSION AND SUGGESTIONS

The survey concludes that male employees in the salt business were more impacted by workplace dangers than female employees. Significantly, the workplace exposed employees to sunlight reflecting into their eyes, salt crystals, and inhalable salt dust. While female workers were mostly involved in packaging and salt collection, male workers were more impacted in tasks including racking, pumping, casting salt beds, and carrying salt. Male workers have experienced more severe health problems as a result of increased physical strain and exposure to hostile environmental conditions. Furthermore, the study indicates that environmental factors significantly affect the health of salt pan workers. Workers in the research area are paid on a monthly basis, and the study discovered a favourable relationship between the sample households' ability to save money and their monthly income. Additionally, it shows that when weekly income rises, so does the capacity to save; nevertheless, the growth in savings is marginally greater than the increase in income of Tuticorin district's sample respondent households. Furthermore, compared to female workers, male employees exhibit poorer awareness and participation in awareness campaigns. The study finds that most salt workers in Tamil Nadu's highest salt-producing district, especially in Tuticorin, were at risk for occupational illnesses. For the benefit of the workers, the study suggests that a hospital with full medical services be built close to the salt pan districts. Additionally, the government must to put in place health awareness campaigns, assistance programs, off-season concessions, and alternate job possibilities for salt pan workers during the rainy season. By addressing these problems, the Tamil Nadu study district's salt industry workers' working conditions and health outcomes will be improved.

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